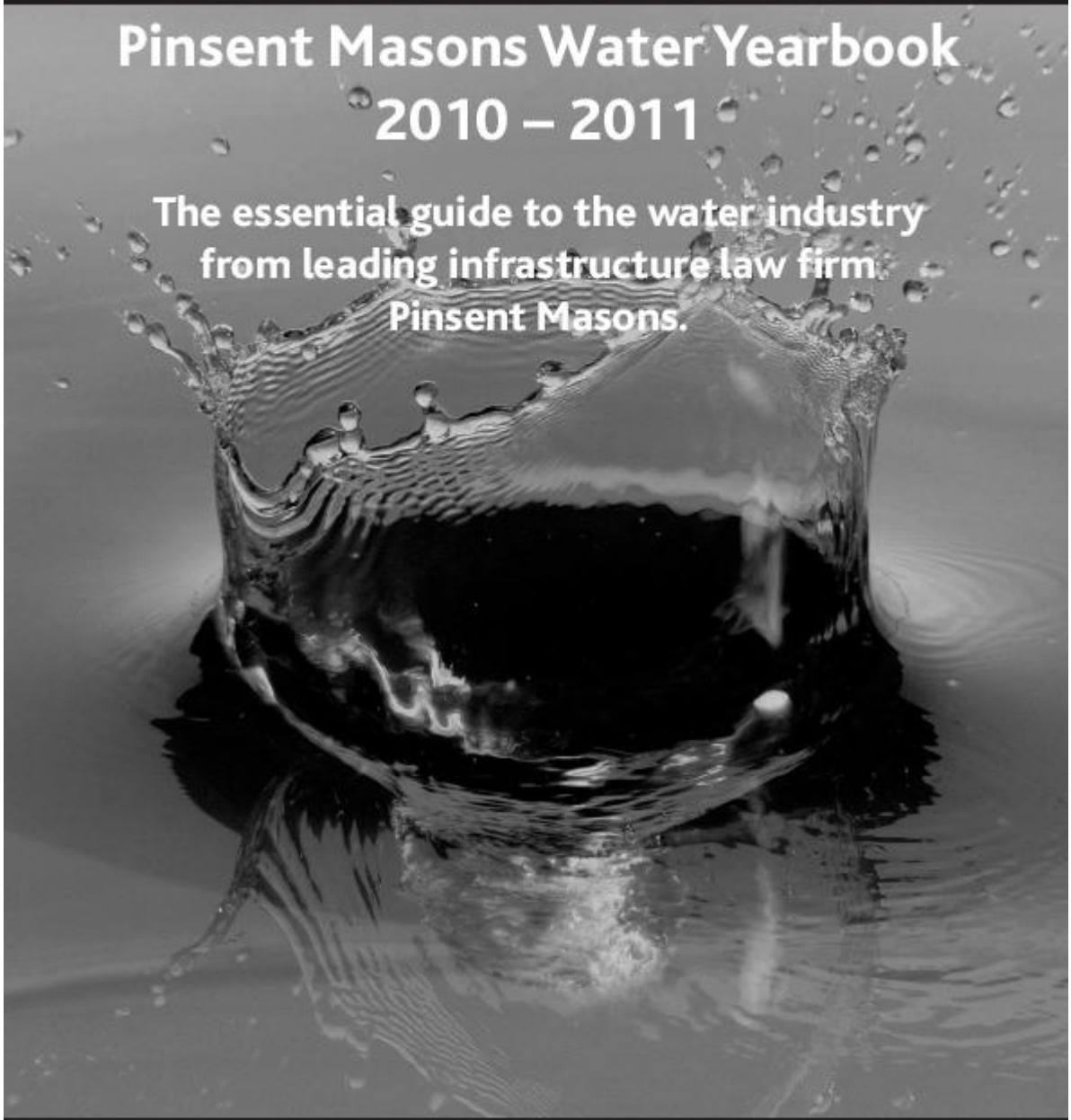


**12th Edition**

**Pinsent Masons Water Yearbook  
2010 – 2011**

**The essential guide to the water industry  
from leading infrastructure law firm  
Pinsent Masons.**



**Pinsent Masons**

**Copyright © Pinsent Masons LLP 2010**

**Published by Pinsent Masons LLP**

**Pinsent Masons LLP  
30 Aylesbury Street  
London EC1R 0ER  
Telephone: 020 7490 4000  
Facsimile: 020 7490 2545  
Email: [enquiries@pinsentmasons.com](mailto:enquiries@pinsentmasons.com)  
Website: [www.pinsentmasons.com](http://www.pinsentmasons.com)**

**ISBN 978 0 9551747-6-6**

**Previous editions:**

**Pinsent Masons Water Yearbook 2009 – 2010 ISBN 0-9551747-5-9  
Pinsent Masons Water Yearbook 2008 – 2009 ISBN 0-9551747-4-0  
Pinsent Masons Water Yearbook 2007 – 2008 ISBN 0-9551747-3-2  
Pinsent Masons Water Yearbook 2006 – 2007 ISBN 0-9551747-1-6  
Pinsent Masons Water Yearbook 2005 – 2006 ISBN 0-9537076-9-5  
Pinsent Masons Water Yearbook 2004 – 2005 ISBN 0-9537076-7-9  
Pinsent Masons Water Yearbook 2003 – 2004 ISBN 0 9537076-5-2  
Pinsent Masons Water Yearbook 2002 – 2003 ISBN 0 9537076 4 4  
Pinsent Masons Water Yearbook 2001 – 2002 ISBN 0 9537076 2 8  
Pinsent Masons Water Yearbook 2000 – 2001 ISBN 0 9537076 1 X  
Pinsent Masons Water Yearbook 1999 – 2000 ISBN 0 9537076 0 1**

**All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of the copyright owner.**

**Whilst every effort has been made to check the accuracy of the information given in this book, readers should always make their own checks. Neither the author nor the publisher accepts any responsibility for misstatements made in it or for misunderstandings arising from it. The main text of this work reflects the information obtained by the author as at October 2010.**

# PINSENT MASONS WATER YEARBOOK 2010 - 2011

## PREFACE

It seems remarkable that *Pinsent Masons Water Yearbook* is now in its twelfth year, “remarkable” in view of the norms of secular yearbook publishing, where an idea rarely survives longer than a few editions and fades un-noticed and unlamented. *Pinsent Masons Water Yearbook*, by contrast, is that rarity in serial publishing ventures in that the formula underlying its enduring success remains substantially unchanged since the first edition. It is doubly unusual in that, although combining the legal expertise of **Pinsent Masons**, the London-based international law firm combining a specialism in construction and infrastructure projects with a comprehensive full service offering, and **Dr David Lloyd Owen** of **Envisager**, the specialist consultancy in environmental services for the water, wastewater and renewable energy sectors, this is no collaboration soured by strutting *prima donnas*, remaining amicable long after many marriages would have failed! If falling short of connubial bliss, it nevertheless continues to produce the pre-eminent market reference work on the state of the water sector in the global marketplace, country by country, in detail unmatched by any other industry publication and Pinsent Masons and Dr Lloyd Owen are again to be congratulated on its scope.

In the continuing economic recession, the besetting tenor of the business climate and debate everywhere is uncertainty. Some, however, in the unreal *demi monde* of government today (notable only for the portfolio they hold more than for any commanding intellectual rigour in their rhetoric) prefer the certainty of vilifying capitalism and so-called “greedy bankers” to substantive solutions that will resolve our dilemmas. The only engine of growth capable of generating those solutions – capitalism – is thus castigated in ways that only envelop our uncertainties in further clouds of unknowing!

Where all this is headed is the premier challenge of our era, and is anybody’s guess, although politicians enjoy effecting certainty. John Kenneth Galbraith, the American economist and diplomat, held that there were only two species of forecaster, “Those who don’t know and those who don’t know they don’t know,” echoing Friedrich Hayek’s “Man does not and cannot know everything and when he acts as if he does, disaster follows.” (Shades of Donald Rumsfeld’s “unknown unknowns”!) They were writing in the 1940s, a time of greater uncertainty than today, but which actually produced men of resolution in contrast to our own time.

So far as this industry is concerned, the situation is little changed from what was reflected in my Preface in the previous edition of the *Yearbook*. Industrialisation in the developing economies of the world fuels urbanisation, particularly in Asia and Latin America, while most of Africa remains a desert of underdeveloped water infrastructure. Demands on physical and social infrastructure still outpace development. These demands are exacerbated by unprecedented levels of transmigration, presenting a confluence of phenomena not helped by the global recession. And breakdown in security in many parts of the world also adds its own baleful constraint on human progress. The Apocalypse could have been written with our era in mind, the Four Horsemen only champing at the bit in the slips throughout human history until now!

### The UK

The final determination for AMP 5 was the most testing for the water companies to date and their response, characteristically, has been to adopt a short-term perspective, while simultaneously turning on their suppliers to pare *their* margins to unsustainably low levels. Strategic supply chain management, as practised in the defence and automotive industries, for example, remains the exception for them even after all these years. In their partial defence, however, it has to be conceded that a five-year-span for a GBP22billion plus spending programme *is* short term and so the new government’s decision to initiate a major review of economic regulation could be said to be timely. A government-imposed resolution, however, would be less flexible and efficient than an industry-inspired one and no substitute for strategic supply chain management.

### The global scene

The dominant global water challenges are the continuing concerns over climate change, water scarcity and the effects of urbanisation. With more than half the world’s population now urbanised, and increasing dramatically in the last ten years – the strain placed on infrastructure, particularly water supply, is such that solutions are urgently needed. This offers scope for the more widespread adoption of private finance in the provision of water and sanitation services, in the process by-passing administrative and political bottlenecks, enhancing transparency in public administration and

combating corruption. This has been a recurrent theme over the years of the author of *Pinsent Masons Water Yearbook*. Parallel options, for the developed and developing world, include technological and operational innovation to secure future supplies and underpin water conservation policies.

An amusing sideline on the climate change/global warming debate, however, arose with the agenda at the 58th meeting in June of the Bilderberg Group (which brings together in secret conclave heads of state and people of influence in the fields of politics, banking, business, the military and the media), which included discussion on global *cooling!* Is there something we should be told?

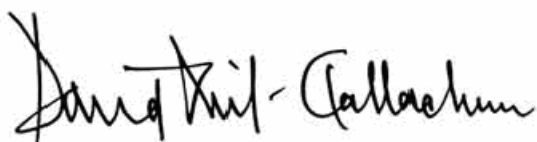
### **Millennium Development Goals**

Aspirational puff, political posturing or realistic?

Whatever your view, only five years remain to achieve them and while laudable progress has been made in some regions, such as East Asia, it is likely that various goals will remain unmet by 2015. However, it is notable that MDG 7 (to halve by 2015 the proportion of the world's population without access to safe drinking water and basic sanitation) would seem to be achievable, at least in part, although the sanitation target is unlikely to be achieved. The UN believes that, if current trends continue, the world will meet, or even exceed, the drinking water target, although the economic crisis may create setbacks and progress is uneven across the goals and the main cause of such unevenness appears to be the highly variable quality of governance.

Nevertheless, aid alone is far from sufficient to ensure the goals are met and, significantly, economic growth is conspicuously absent from the Millennium Declaration, although pivotal to their achievement.

These are the complexities policy makers, international institutions, the global water industry and in particular its UK component, are grappling with against a backdrop of economic gloom unknown for more than half a century. These subjects, and more, are analysed in detail and with persuasive force (not to say some quixotic humour for which David Lloyd Owen finds a little room!) in this publication. Pinsent Masons is again to be congratulated for its foresight and persistence in continuing with this highly informative enterprise.



**David Neil-Gallacher**

Chief Executive

British Water

October 2010

**Dr David Lloyd Owen**

David Lloyd Owen is the CEO of Envisager Limited a company that advises companies, investment banks and governments on water and waste management markets and their competitive, regulatory and environmental drivers. He was an equity analyst at UBS (Savory Milln) and BNP Paribas and founded Ecofin Limited in 1991 and has followed the water and waste management sectors since 1989. In addition to writing 12 editions of the Pinsent Masons Water Yearbook he has written 6 books on the water services sector in Europe, one on water finance and is a columnist for Global Water Intelligence. He is a member of the advisory boards of Pictet Funds Water Fund and XPV Capita, a member of Glas Cymru Cyf (Dwr Cymru Welsh Water) and on the investment committee of WHEB Asset Management.

His publications include:

2009: 'Tapping Liquidity: Financing Water and Wastewater 2010-2020', Thomson Reuters, London

2006: 'Financing water and wastewater to 2025: From necessity to sustainability', Thomson Financial, London

2002: The European Water Industry: Market Drivers and Responses. CWC Publishing London

1999: making Waves Overseas, West LB, London

1998: European Water Company Profiles

Financial Times Energy

## Pinsent Masons Water Sector Group

Pinsent Masons LLP is a full service law firm with around 280 partners, a total legal team of around 1,100 and more than 1,800 staff in the UK and internationally.

The firm's Water Group has extensive experience on a world-wide basis of water, wastewater, desalination, and industrial water reuse projects, many of them procured on a BOT basis or on a Public/Private Partnership basis, as well as of water resource management, environmental, and corporate issues encountered by water utilities and other entities involved in the water industry.

Pinsent Masons Water Group also has significant experience in the field of regulatory law issues relating to water.

The Water Group was recently awarded a Distinction by Global Water Intelligence in the Global Water Law Firm of the Year Category at the Global Water Awards in April 2008.

The Water Group regularly holds Wet Network events to promote the introduction of new technology into the global water sector. Over four years more than 60 companies have presented at our Wet Network events.

Examples of recent projects include the following:

- advising the EPC water contractor on the USD3.5billion Ras Laffan C desalination project in Qatar;
- advising Thames Water on the procurement of their next five year asset management programme (AMP5) covering all capital and maintenance works;
- advising one of the largest water treatment companies in the world and a blue-chip conglomerate in Hong Kong in respect of a foreign direct investment in a water treatment plant in Chongqing, People's Republic of China;
- advising a consortium on its bid for the New Cairo Wastewater Treatment Plant PPP;
- advising a consortium on its bid for the Muharraq wastewater concession project in Bahrain;
- advising a bidder on its bid for the Riyadh Water Privatisation;
- advising a bidder in connection with the Jeddah Water Privatisation;
- acting for the concessionaire on its negotiations with the Government of Pakistan for a desalination concession project to be located in Karachi;
- advising a major Singapore based contractor on risk allocation and contractual arrangements for various water process unit projects in Dubai, including Palm Jumeirah;
- advising the Degremont/Besix joint venture in connection with the Jumeirah Golf Estates wastewater treatment plant concession;
- advising United Utilities on procurement of an extension to their Mersey Valley site process treatment plant and de-watering facilities, including the addition of a new incinerator;
- advising a member of the EPC construction consortium on its successful bid for the USD3.5billion Marafiq desalination project at Jubail, Saudi Arabia;
- advising an international operator in its bid for a water and electricity distribution operations and maintenance contract in Abu Dhabi;
- advising in connection with the restructuring and refinancing of the Ajman wastewater concession project;
- advising a bidder in connection with the USD200million Taweelah desalination project in Abu Dhabi;

- advising United Utilities on their AX4 programme under which they are procuring all capital works for their water and electricity businesses from 2005 to 2010. This is one of the largest procurement programmes in the utilities industry: value GBP4billion;
- advising a bidder on its bid for Project Aquatrine, the UK Ministry of Defence project to outsource its water and wastewater functions under the Private Finance Initiative;
- advising on a major industrial water outsourcing project in the UK;
- advising a UK Utility Group, part of the preferred bidder consortium, on the Engineering Procurement Construction contract issues (Package 1), in connection with the design, build and operation of a water treatment plant in Beijing. Beijing No. 10 is the fourth formal BOT project in China;
- advising a member of a bidding consortium in connection with the Disi-Amman water conveyor BOT project in Jordan;
- advising part of a consortium bidding for the Dublin Bay Ringsend Treatment Works wastewater project in Dublin;
- acting for the Government of Sri Lanka on the Greater Negombo Water PSP project;
- advising the South African Department of Water Affairs and Forestry on the form of model contracts to regulate water services for the benefit of South African municipalities;
- acting for the preferred bidder in connection with the Levenmouth Wastewater Treatment project in Scotland. This is a bond financed project procured under the UK Government's Private Finance Initiative;
- advising administrators to a mineral water company on the transfer of abstraction licenses;
- advising OFWAT on an appeal to the Competition Appeal Tribunal by Aqua Resources Limited;
- advising the National Offender Management Service on a claim by water undertaker for its costs for constructing a pumping station and rising main and gravity sewer at HMP Gartree;
- advising PAI Partners on the UK aspects of their EUR1.7billion disposal of water company SAUR to a consortium led by Caisse des Depots.

For further details of Pinsent Masons' capabilities and experience in the water, wastewater, desalination and industrial water re-use sectors, and of the firm's capabilities and experience in the regulatory field, contact **Mark Lane**, Head of the Water Group, at:

<b>Pinsent Masons</b>	
30 Aylesbury Street	
London	
EC1R 0ER	
Tel:	+44 (0)20 7490 4000
DDI:	+44 (0)20 7490 6214
Mobile:	+44 (0)7860 872533
Fax:	+44 (0)20 7490 2545
Email:	mark.lane@pinsentmasons.com
Web:	www.pinsentmasons.com

**CONTENTS**

Please click on page numbers for link to relevant section

PREFACE	iii
DR DAVID LLOYD OWEN	v
PINSENT MASONS WATER SECTOR GROUP	vi
CONTENTS	viii
INTRODUCTION	xiv
HOW TO USE THIS BOOK	xvii
<b>PART 1: THE WORLD OF WATER 2008-09</b>	1
<b>PART 2: COUNTRY ANALYSIS</b>	53
ARGENTINA	54
AUSTRALIA	58
BANGLADESH	64
BELIZE	67
BOLIVIA	68
BRAZIL	71
CAMBODIA	78
CANADA	80
CHILE	84
CHINA	88
COLOMBIA	108
COSTA RICA	111
CUBA	112
ECUADOR	114
INDIA	116
INDONESIA	126
JAPAN	132
KAZAKHSTAN REPUBLIC	137
MALAYSIA	140
MEXICO	147
NEPAL	153
NEW ZEALAND	155



PAKISTAN	158
REPUBLIC OF PANAMA	162
PARAGUAY	163
PERU	164
PHILIPPINES	168
SINGAPORE	174
SOUTH KOREA	176
SRI LANKA	179
TAIWAN	182
THAILAND	187
TRINIDAD AND TOBAGO	191
UNITED STATES OF AMERICA	192
URUGUAY	202
VENZUELA	204
VIETNAM	207
<b>PART 3(i): COMPANY ANALYSIS: MAJOR PLAYERS</b>	211
SAUR	212
SUEZ ENVIRONNEMENT SA	215
VEOLIA ENVIRONNEMENT SA	238
RWE AG	268
ACEA	273
AGUAS DE BARCELONA SA	278
FCC	285
SEMBCORP	290
<b>PART 3(ii):COMPANY ANALYSIS: LOCAL/REGIONAL PLAYERS</b>	297
ARGENTINA: LATIN AGUAS/CHAMAS GROUP	298
AUSTRALIA: UNITED GROUP LIMITED	300
BRAZIL: ANDRADE GUTIERREZ CONCESSOES	301
BRAZIL: CAB AMBIENTAL	302
BRAZIL: COMPANHIA DE SANEAMENTO DE MINAS GERAIS (COPASA)	303
BRAZIL: GRUPO AGUAS DO BRASIL	305
BRAZIL: GRUPO EQUIPAV SA	307

BRAZIL: RIOVIVO ENGENHARIA AMBIENTAL LTDA	308
BRAZIL: SABESP	309
CANADA: AQUATECH WATER MANAGEMENT SERVICES INC	311
CAYMAN ISLANDS: CONSOLIDATED WATER	312
CHILE: AGUAS ANDINAS	314
CHILE: AGUAS NUEVAS	317
CHILE: ANTOFAGASTA PLC	318
CHILE: ESSBIO	319
CHILE: ESVAL	321
CHILE: NUEVOSUR	322
CHINA: ANHUI WATER RESOURCES DEVELOPMENT CO	323
CHINA: BEIJING CAPITAL CO	324
CHINA: BEIJING ENTERPRISES WATER GROUP LIMITED	327
CHINA: BEIJING HEROCAN	330
CHINA: BIO TREAT TECHNOLOGIES	331
CHINA: CATHAY INTERNATIONAL GROUP	333
CHINA: CHEUNG KONG INFRASTRUCTURE HOLDINGS LTD	334
CHINA: CHINA EVERBRIGHT INTERNATIONAL	335
CHINA: CHINA WATER GROUP	337
CHINA: CHINA WATER AFFAIRS GROUP	338
CHINA: CHINA WATER INDUSTRY GROUP	340
CHINA: CHONGQING WATER GROUP	342
CHINA: CITIC PACIFIC LTD	341
CHINA: EASEN INTERNATIONAL	344
CHINA: GALAXY WATER INC	345
CHINA: GLOBAL GREEN TECH GROUP	346
CHINA: GOLDEN STATE	347
CHINA: GUANGDONG GOLDEN DRAGON DEVELOPMENT LTD	349
CHINA: GUANGDONG INVESTMENT LTD	350
CHINA: GUOZHEN ENVIRONMENTAL PROTECTION	351
CHINA: HEILONGJIANG INTERCHINA WATER TREATMENT	352
CHINA: HONG KONG & CHINA GAS AND LIGHT	354

CHINA: JIANGXI HONGCHENG WATERWORKS CO	355
CHINA: MING HING WATER HOLDINGS LIMITED	356
CHINA: NANHAI DEVELOPMENT COMPANY LIMITED	357
CHINA: NINGBO FUDA COMPANY LIMITED	358
CHINA: NWS HOLDINGS LTD	359
CHINA: QIANJIANG WATER RESOURCES	361
CHINA: SHANGHAI INDUSTRIAL HOLDINGS	362
CHINA: SHANGHAI CHENGTOU HOLDING CO LTD	364
CHINA: SHANGHAI URBAN CONSTRUCTION GROUP	365
CHINA: SHANGHAI YOUNG SUN INVESTMENT CO LTD	366
CHINA: SHENZHEN KONDARL (GROUP) CO LTD	367
CHINA: SICHUAN GUANGAN AAA PUBLIC CO LTD	368
CHINA: SOUND GLOBAL	369
CHINA: SUZHOU NEW DISTRICT HI-TECH INDUSTRIAL CO LTD	371
CHINA: TIANJIN CAPITAL ENVIRONMENTAL PROTECTION	372
CHINA: WUHAN SANZHEN INDUSTRY HOLDING CO LTD	374
CHINA: XINJIANG URBAN CONSTRUCTION CO LTD	375
CHINA: ZHONGSHAN PUBLIC UTILITIES GROUP	376
INDONESIA: ACUATICO	377
INDIA: BHEL	378
INDIA: IVRCL CONSTRUCTION AND PROJECTS LTD	379
INDIA: JINDAL AQUASOURCE	380
INDIA: JUSCO	381
INDIA: LARSEN & TOUBRO	383
INDIA: VA TECH WABAG	384
JAPAN: MITSUBISHI	385
JAPAN: MITSUI	387
MALAYSIA: GOLDIS	388
MALAYSIA: INTAN UTILITIES BERHAD	389
MALAYSIA: KUMPULAN PERANGSANG SELANGOR BERHAD	390
MALAYSIA: PBA HOLDINGS BHD	392
MALAYSIA: PPB GROUP BERHAD	393

MALAYSIA: PUNCAK NIAGA BERHAD	394
MALAYSIA: RANHILL BHD	396
MALAYSIA: SALCON ENGINEERING BERHAD	398
MALAYSIA: SYNERGY HEIGHTS SHSB	401
MALAYSIA: TALIWORKS CORPORATION	402
MALAYSIA: YTL CORPORATION BHD	403
MEXICO: AQUASOL	404
PHILIPPINES: BENGUET CORPORATION	405
PHILIPPINES: MANILA WATER CO	406
PHILIPPINES: METRO PACIFIC INVESTMENTS	408
SINGAPORE: ASIA ENVIRONMENT HOLDINGS LTD	409
SINGAPORE: ASIA WATER TECHNOLOGY LTD	413
SINGAPORE: BOUSTEAD SINGAPORE LTD	415
SINGAPORE: DARCO WATER TECHNOLOGIES PTE	416
SINGAPORE: HYFLUX LTD	418
SINGAPORE: SOUND GLOBAL LIMITED	422
THAILAND: THAI TAP	425
THAILAND: EASTERN WATER RESOURCES DEVELOPMENT & MANAGEMENT PUBLIC CO	427
USA: AECOM	430
USA: ALLIANCE WATER RESOURCES	432
USA: AMERICAN WATER WORKS	433
USA: AMERICAN STATES WATER	437
USA: AQUA AMERICA INC	439
USA: ARTESIAN RESOURCES CORPORATION	442
USA: CADIZ INC	443
USA: CALIFORNIA WATER SERVICE CO	444
USA: CH2M HILL	446
USA: CONNECTICUT WATER SERVICE COMPANY	447
USA: GLOBAL WATER RESOURCES	449
USA: HAN'S TECHNOLOGIES INC	450
USA: MIDDLESEX WATER COMPANY	451

USA: PENNICHUCK CORPORATION	453
USA: PICO HOLDINGS INC	454
USA: PURE CYCLE CORP	456
USA: SJW CORP	457
USA: SOUTHWEST WATER COMPANY	458
USA: UTILITIES INC	461
USA: WESTERN WATER	462
USA: YORK WATER	463
<b>APPENDIX 1: THE WATER CYCLE AND WATER SERVICES</b>	465
<b>APPENDIX 2: PRIVATE SECTOR PARTICIPATION</b>	472
<b>APPENDIX 3: THE PRIVATE SECTOR AND THE MILLENNIUM DEVELOPMENT GOALS</b>	488
<b>APPENDIX 4: GLOSSARY OF WATER AND FINANCE TERMS AND ABBREVIATIONS</b>	503
<b>APPENDIX 5: REFERENCES AND FURTHER READING</b>	514

## INTRODUCTION

This is the 12<sup>th</sup> edition of the *Pinsent Masons Water Yearbook* and thanks to the onward march of new companies across the world the tome continues to grow in substance, even after being split into its current bi-annual reporting cycle. This edition marks the start of the third cycle of the "new series" and continues to benefit from new information sources, especially for smaller companies, which throws more light on the emergence of local players. World Bank data has been especially useful in identifying companies that are usually out of the public eye. Global Water Intelligence continues to evolve as a source of information, especially via its annual conference.

### Company changes

17 companies are held by what are essentially financial investors, one in France, two in the USA, five in Chile and eight in the UK, including three of the ten water and sewerage companies. After the sale of SmVaK of the Czech Republic to a listed company (FCC of Spain) in 2006, activity within the private equity sector has been on the rise, with SAUR, Southern Water, Mid Kent, South East Water and three Chilean companies being sold on to other private equity investors. What happens to some of these acquisitions will be interesting, as market conditions have changed greatly since 2008. For some, stability is the key, as Macquarie has pointed out; it currently intends to hold onto Thames Water 'for decades'.

11 new company entries have been made in this edition; two from Japan herald the belated entry of the Japanese as significant players in this market, one underlines Singapore's pivotal role in South East Asia and the other eight reflect the rise of the BRICs with five from China, two from India and one from Brazil. Russia will have its turn in the next edition.

All the departed companies come from Developed countries; Cascas was bought by SembCorp, Covanta and Tyco have sold off their activities, as has Linde. The divestment of United Utilities' international activities and Biwater's interest in Cascas mean that these companies are now seen as second tier players, with SembCorp taking their place.

### Companies covered

	1999	2001	2003	2005	2007	2008	2009	2010
Number of countries	13	16	18	28	27	28	29	29
Number of companies	70	82	102	128	145	150	157	164
- OECD countries	59	70	73	77	75	78	77	75
- Advanced developing	2	2	6	13	19	20	22	24
- Developing	9	10	23	38	51	52	58	65

The trend away from OECD countries continues. In 1999, 84% of companies covered were based in the OECD. The membership of Chile in 2010 does not affect this, as its PSP programme was concluded some time ago.

### The size of the sector continues to grow

In 1999, 5% of the world's population was served to some extent by the private sector. By 2006, this had increased to 10% of the world's population and is estimated at 12% in 2010, with at least 862million people served, an increase of 60million from the previous edition. The increase reflects one major wastewater contract in Mexico, the IPO of the Chongqing Water Group and hitherto overlooked contracts being found as well as new contracts gained as various databases have been brought into play.

Our revised forecast for the extent of PSP in 2015 is 1,202million, an upwards adjustment of 39million on the forecast made in 2009, reflecting a tentatively optimistic outlook since 2005. The overall forecast is maintained at 16% of the population by 2015 while it has been increased again for 2025, this time from 20% to 21%.

### Building BRICs

The rise of the Chinese market has been noted for some years. It is now timely to consider the BRICs as these four countries account for just over half of the global market in population terms, with 92million accounted for in Brazil, India and Russia.

**People served in the BRIC countries by national and international players (million)**

All BRICs	National				International			
	N	Water	WW	Both	N	Water	WW	Both
1985-89	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1990-94	3	0.1	0.0	0.1	5	3.9	0.1	4.0
1995-99	27	43.2	21.5	43.5	22	25.3	5.9	25.6
2000-04	101	28.7	41.4	62.7	66	43.4	15.9	54.6
2005-09	245	63.3	148.4	167.3	92	32.7	22.5	52.6
2010	17	15.8	5.2	21.0	1	3.0	0.0	3.0
<b>Total</b>	<b>393</b>	<b>151.1</b>	<b>216.5</b>	<b>294.6</b>	<b>186</b>	<b>108.3</b>	<b>44.4</b>	<b>139.8</b>

**And to grow more diverse**

The entire nature of the market has changed over the past half decade. While the 'big two' remain the clear market leaders, the perceived global domination of the former 'big five' is now a distant memory.

As Agbar and SAUR develop more focussed strategies and RWE concentrates on Germany and Central & Eastern Europe, the market share enjoyed by the 'big five' has fallen from a peak of 73% in 2001 to 32% by the end of 2010.

While we retain these companies for comparative purposes, this will change as Agbar is absorbed into Suez and the rise of other major players becomes irresistible. FCC serves 27million people worldwide and SABESP 23million and rising. A group of players in China already serve over 15million people each and are set to exceed 20million within the next few years.

Along with more companies meriting an entry, we have identified a further 112 companies active in the sector. Their influence is important locally, but more marginal on a global scale. The 927 contracts covered in the Envisager database that relate to companies with full entries in the Yearbook cover 696million people with an average of 750,000 people per contract, compared with 55million people covered by the 193 contracts held by the secondary companies, with an average of 282,000 people per contract. Even so, the gap is narrowing.

**Contract awards - % of population served for both water and sewage**

	1985-89	1990-94	1995-99	2000-04	2005-09	2010	Total
National – Total	24%	35%	36%	44%	50%	61%	43%
Regional – Total	7%	2%	3%	9%	11%	0%	7%
International – Total	69%	63%	61%	48%	39%	39%	50%

Along with identifying many new players (especially using World Bank data and comparing it with our extant databases) some studies by the World Bank have highlighted both the emergence and the extent of formal small players (those providing new investment and services) and informal operators, such as water vendors. The latter exist because there is nothing being provided by the incumbent utilities. The great challenge is to integrate them within the formal services to boost the level of people with adequate water and sanitation services at affordable prices.

**Still a contentious sector to operate in**

Since 1997, contracts involving 71million people have ended. Even taking into account the 7million where the contracts expired at the end of their allotted span, this is 8% of all identified contracts and represents a high attrition rate, albeit better than the 11% level in 2006. According to the World Bank, 64 out of 713 contracts identified, or 34% of contracts (in terms of total investment) were either cancelled or in distress in 2009, compared with 3-8% for telecoms, electricity and transport in 2008, and has been in a 29-37% range since 2005.

The OECD made an encouraging start this spring in setting out agendas for research in the run up to the 6<sup>th</sup> World Water Forum in Marseille and 4<sup>th</sup> World Water Assessment, which will both be launched in April 2012. This is badly needed, as the water and sanitation targets for the 2015 Millennium

Development Goals will only be partially met and there remains a crying need to re-launch the World Water Vision's target of universal access to water and sanitation by 2025. Much of the work lies in making people appreciate that investing in these assets and services makes good economic sense, especially in a recession.

The essence of the challenge lies in population growth and urbanisation: between 1990 and 2008, 1,052million urban dwellers have gained safe water supplies and 813million improved sanitation, but during that time the world's urban population has grown by 1,089million.

The United Nations passed a resolution (A/HRC/15/L14) on 30<sup>th</sup> September 2010 recognising the role played by non-state service providers and reaffirming that the delegation of such services to third parties still means that the state is responsible for making sure that people receive safe water and sanitation services. This is most encouraging news, as it is a setback for those who believe that water has to be a tool of state control. Involving the private sector is not a universal panacea, but it has its charms. After all, people need an incentive to provide more and better infrastructure and people need to have their preferences respected. In India in 2004, there were 28million mobile phones and 207million people had access to household improved water supplies. By 2008, 260million enjoyed household water access and 347million mobile phones were being used. I suspect that one service is being allowed to expand in response to consumer demand and another is not.

### **The turning of the tide**

Sound Global of Singapore and China gained its first engineer, procure and build contract in the MENA region this year. The significance of this (and the increasingly global role played by companies from Singapore such as SembCorp and Hyflux) cannot be overstated. The message is simple: globalisation works both ways.

### **Taking the Yearbook forward**

The task of assembling each edition of this Yearbook provides a mass of new insights into the market and its modus operandi. Each edition gets closer to its goal of providing a true and fair view about the markets and companies that serve them and this year has been particularly productive in gaining an insight into lesser known players in Asia and Latin America. The author is responsible for any errors and omissions that may occur in this Yearbook. He is thus grateful for any feedback and suggestions so that future editions can rectify them and more closely reflect the needs of its readers. This feedback lay behind the splitting of the Yearbook into its current format in 2005 (Europe, Africa and the Middle East in 2005, 2007 and 2009 and Asia and the Americas in 2006, 2008 and 2010) and the author looks forward to the start of a fourth cycle next year.

**Dr David Lloyd Owen**

**October 2010**



## HOW TO USE THIS BOOK

The Pinsent Masons Water Yearbook is divided into four parts. Part 1, The World of Water takes a look at trends noted in water and wastewater services worldwide over the past 12 months and considers how these are set to evolve. Part 2 covers countries of interest in Asia and the Americas to those involved in providing water and wastewater services. Part 3 covers companies providing these services that are wholly or partly in the private sector; firstly the major international players and then companies based in Asia and the Americas. The Appendices make up the final part and provide background data about the sector, a Glossary of Terms and Abbreviations used in the Yearbook and a listing of the main references used.

### Country entries

Population and economic data is given in order to provide an indication of demographic trends and the current state of economic development. The former outlines the size of the potential market, while the latter highlights affordability issues and spending priorities. The surface water and ground water data boxes outline how much water is available in each country on an annual basis, along with how much is currently being taken out. For groundwater, water availability relates to the annual natural recharge of water into water bearing rocks. For surface water, this refers to water that is in an abstractable form, entering rivers, streams and lakes whether through rainfall or rivers in neighbouring countries. Generally, any country that takes more than 25% of these renewable resources is likely to be facing at least regional water shortages, while a figure in excess of 40% points to genuine scarcity.

Two tables containing information about companies and contracts in each country aim to provide access to company entries. Where reference is made to specific data, it is mentioned in the country entry. Otherwise, a range of global and regional overviews have been used for compiling the common data entries. Details can be found in the References section in the Appendices.

### Company entries

The company entries provide a description of how each company became involved in the sector and its overall strategies, when known. Wherever possible, a Profit & Loss account is provided along with contact data (company address, main switchboard, and web site, along with senior management) and details about water and wastewater services in their home and international markets. While the company contact details are as up to date as possible, the turnover in senior management seen in the sector means that sometimes names change between, for example, Annual Reports being published. In addition, wherever possible, international contracts are tabulated to show [1] year of contract award, [2] city/region, [3] contract type and duration and [4] population served and service provided.

### Making sense of numbers

It will be seen that for both company and country entries, the sum of the water and sewerage numbers are not always the same as the total served figure given. This is because the number of people served in different contracts may be for different services. For example, Company A has three contracts: the first (City X) is for 1million people and is for water only, the second (City Y) is for 1million and is for sewerage only and the third (City Z) is for water and sewerage. Therefore the combined number of people served is 2million for water, 2million for sewerage and 3million for all services.

### Definitions – privatisation and the private sector

Privatisation is used to mean an asset sale (or developing the assets from scratch), which with some exceptions in China has only been used in the USA, England & Wales and Chile. Otherwise, the TLAs (triple letter acronym) PSP (private sector participation) or PPP (private-public partnership) are used. To count as the latter, the operating contract had to be of at least four years in duration and to involve either operations and management (O&M), lease (affermerge) or a concession (BOT, etc).

### Why numbers change year to year

Estimating numbers served is an inexact art at the best of times. The expansion of the sector has hardly lessened this challenge in recent years. Sometimes companies vary the stated numbers served and do not explain why. For example there has been a fall in the number served in France by both Veolia Environnement (Générale des Eaux) and Suez Environnement (Lyonnaise des Eaux) due to the ending of various cross holdings. Wherever possible new data is used to track contracts and ensure the information is accurate. With 1,120 contracts now in the Pinsent Masons Water Year Book/Envisager database, this gives plenty of scope for changes each year.

**Appendices**

Three appendices provide an overview of the drivers affecting the water and wastewater service sectors, where the private sector fits in (or does not) and pertinent issues affecting the role and responsibilities of private sector players including risk management, assisting in meeting the Millennium Development Goals and joint initiatives.

**Glossary**

The water and wastewater sectors are not immune to jargon and acronyms, especially the TLA. The Glossary at the back of the Yearbook provides an explanation of those examples that are to be found in this book. As with definitions of contract types, definitions of certain terms can vary. In this book, we have kept with the most commonly accepted definitions and those that are most likely to be of relevance to potential readers.

**References**

As well as outlining the major studies that have provided the basis for the country data entries, the references are divided into thematic sections to provide a selection of the more pertinent publications about water and wastewater services and their political, social, environmental, economic and regulatory contexts. Web sites are not included in this section due to their transient nature, especially when it comes to accessing pages within a particular site, but this will be reviewed in future editions.

# **PART 1: THE WORLD OF WATER 2010-11**

## THE WORLD OF WATER 2010-10

### CORPORATE CHANGES, 2008-2010

17 companies are currently held by financial investors, one in France, two in the USA, five in Chile and nine in the UK, including four of the ten water & sewerage companies. This is a net increase of six since 2006, with one company (SmVaK of the Czech Republic) being sold by its private investor to a listed company (FCC of Spain), the first such exit noted to date. SAUR is set to follow in the medium term, as Séché Environnement (a French waste management company) has the option to buy out its private equity partners at an appropriate date.

Eleven new company entries have been made in this edition, five in China, two in India, two in Japan, one in Brazil and one in Singapore. Two other companies (Rosvodokanal of Russia and Kardan NV of the Netherlands) are set to be fully covered next year in the 2011-12 edition, where good quality information became available too late for inclusion in the main entries. A number of new minor players have also been noted, where information and/or contracts involved is too small to merit a formal company entry. Four companies have left this year, one from the UK and Germany and two from the USA.

#### Financial sector parent companies [1]

Operating Company	Private Equity / Bank
Utilities Inc (USA)	AIG (USA)
South Staffs Water (UK)	Alinda Infrastructure Fund (USA)
ESSCO (Chile)	Aguas Neuvas (Chile)
ESVAL (Chile)	Ontario Teachers' Pension Plan (Canada)
East Surrey Water (UK)	Deutsche Bank (Germany)
Aquarion (USA)	Macquarie (Australia)
Thames Water (UK)	Macquarie (Australia)
AWG (UK)	Osprey Acquisitions (Canada)
SAUR (France)	Séché Environnement, CDC & AXA (France)
Southern Water (UK)	JP Morgan (USA)
ESSEL (Chile)	Ontario Teachers' Pension Plan (Canada)
ESSBIO (Chile)	Ontario Teachers' Pension Plan (Canada)
ANSM (Chile)	Ontario Teachers' Pension Plan (Canada)
Portsmouth Water (UK)	South Downs (UK)
Mid Kent Water (UK)	Westpac (Australia)
South East Water (UK)	Westpac (Australia)
Kelda Group (UK)	Saltaire Water (UK)

#### Water operating subsidiaries

Operating Company	Parent Company(s)
Aqualia (Spain)	FCC (Spain)
Bristol Water (UK)	Agbar (Spain)
Cambridge Water (UK)	Cheung Kong Holdings (China)
Cascal (UK)	SembCorp (Singapore)
AECOM Water (USA)	AECOM (USA)
EMC (USA)	American Water Works (USA)
Ondeo / Lyonnaise des Eaux	Suez Environnement (France)
SmVaK (Czech Republic)	FCC (Spain)
Veolia Water / Générale des Eaux	Veolia Environnement (France)
Wessex Water (UK)	YTL Holdings (Malaysia)

**Major corporate changes since 2009**

<b>New Entries</b>	
Asia Water Technologies (Singapore)	Re-identified, post restructuring
Chongqing Water Group (China)	Partial IPO in 2010
Galaxy Water (China)	Identified in detail
Grupo Aguas do Brasil (Brazil)	Acquisition and contract gains
Heilongjiang Interchina Water (China)	Partial spin-off from Interchina Holding
Interchina Holdings (China)	Identified in detail
Jindal Aquasource (India)	Recent move into BOT contracts
Mitsubishi (Japan)	Acquisition and contract gains
Mitsui (Japan)	Acquisition of various subsidiaries
VA Tech Wabag (India)	Identified in detail prior to IPO
Zhongshan Public Utilities (China)	Identified for first time

<b>Added to Major Companies List</b>	
SembCorp (Singapore)	Acquisition of Cascal adds to its activities

<b>Removed from Major Companies List</b>	
Biwater (UK)	Minimal project portfolio net of Cascal
Cascal (UK)	Acquired by SembCorp
United Utilities (UK)	Divestment of all non UK activities

<b>Companies Removed</b>	
Cascal (UK)	Acquired by SembCorp (Singapore)
Covanta (USA)	Sale of remaining water activities
Linde (Germany)	EMC sold to American Water Works
Tyco (USA)	Sale of remaining water activities

<b>Name Changes</b>	
China Evergreen	Name changed to China Water Group
Southern Cross	ESSBIO now held by OTPP
Sound Group / Eguard	Now called Sound Global
EMS Energy	Eco Water sold to Synergy Heights

<b>Forthcoming Entries</b>	
Kardan NV (Netherlands)	Information and project pipeline identified
Rosvodokanal (Russia)	Information now merits full entry

[1] Companies held by private equity houses and banks: As these are financial rather than operating holdings, these are typically classified under the operating company's name and country.

**NUMBER OF PEOPLE SERVED BY COUNTRY AND COMPANY****Developments during 2009-10**

After the dramatic setbacks noted in 2002 to 2004, with contracts being handed back and a cooler corporate attitude towards seeking contracts in developing economies, 2005 saw an upsurge in

business in Europe and Asia, along with a more difficult operating climate in much of Latin America and Sub-Saharan Africa. Contract closures have eased in recent years, with the four noted in 2008-09 having with one exception been at (or indeed beyond) their intended expiry date. Such is the degree of activity noted in China, along with major contracts in for example India, Algeria, Brazil and Egypt that between 2006 and 2008, a high rate of PSP awards in population terms has been maintained. 2009 shows a dip (but as ever, full figures take at least two years to emerge) but it is already evident that two major contract awards in 2010 have revived overall momentum.

This year, the industrial water/effluent only contracts were removed from the contract database in order to concentrate on municipal contracts, which was the original intention.

**PSP contracts awarded by year (million people served)**

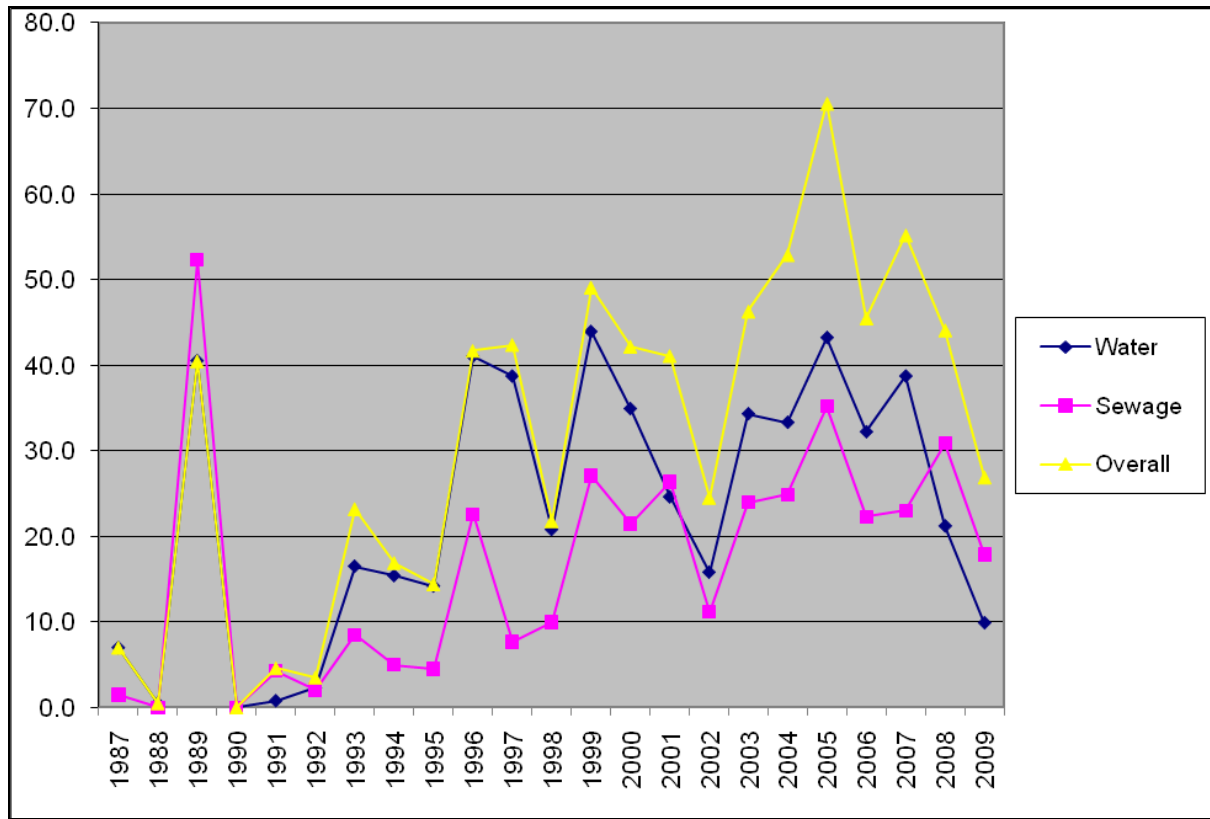
	<b>Water</b>	<b>Sewerage</b>	<b>Overall</b>	<b>Number</b>
1987	7.0	1.5	7.0	2
1988	0.5	0.0	0.5	1
1989 [1]	40.5	52.3	40.4	13
1990	0.00	0.0	0.0	0
1991	0.8	4.3	4.6	5
1992	2.3	2.1	3.5	6
1993	16.5	8.5	23.2	14
1994	15.4	5.0	16.9	27
1995	14.2	4.5	14.4	25
1996	41.0	22.6	41.7	32
1997	38.7	7.7	42.4	41
1998	20.8	10.0	21.8	30
1999	43.9	27.1	49.1	74
2000	34.9	21.5	42.2	70
2001	24.6	26.4	41.1	58
2002	15.8	11.2	24.5	44
2003	34.3	24.00	46.3	82
2004	33.3	24.9	52.9	115
2005	43.2	35.2	70.6	101
2006	32.2	22.3	45.5	78
2007	38.7	23.0	55.2	97
2008	21.2	30.9	44.1	111
2009	9.9	17.9	26.9	70
2010 [2]	19.4	16.0	35.4	24
<b>Total</b>	<b>549.1</b>	<b>398.9</b>	<b>750.3</b>	<b>1,120</b>

[1] Sewerage privatisations in England & Wales not added to the overall year total as these areas had were been served for water by the Statutory Water Companies

[2] To the end of September 2010

As shown on the following graph, when taking into account the one to two year lead effect of contracts filtering through, overall activity in terms of the number of PSP awards and the number of people being connected to new projects is continuing to advance at a steady rate.

**Graph: PSP awards – million people per year, 1987-2009**



**Cumulative total of contract awards, 1987-10**

	Water	Sewage	Overall	Number
1987	7.00	1.50	7.00	2
1988	7.50	1.50	7.50	3
1989 [1]	48.00	53.80	48.00	16
1990	48.00	53.80	48.00	16
1991	48.80	58.10	52.60	21
1992	51.10	60.20	56.10	27
1993	67.60	68.70	79.30	41
1994	83.00	73.70	96.20	68
1995	97.20	78.20	110.60	93
1996	138.20	100.80	152.30	125
1997	176.90	108.50	194.70	166
1998	197.70	118.50	216.50	196
1999	241.60	145.60	265.60	270
2000	276.50	167.10	307.80	340
2001	301.10	193.50	348.90	398
2002	316.90	204.70	373.40	442
2003	351.20	228.70	419.70	524
2004	384.50	253.60	472.60	639
2005	427.70	288.80	543.20	740
2006	459.90	311.10	588.70	818
2007	498.60	334.10	643.90	915
2008	519.80	365.00	688.00	1,026



	<b>Water</b>	<b>Sewage</b>	<b>Overall</b>	<b>Number</b>
2009	529.70	382.90	714.90	1,096
2010 [2]	549.10	398.90	750.30	1,120

[1] Sewerage privatisations in England & Wales not added to the overall year total as these areas had been served for water by the Statutory Water Companies

[2] To the end of September 2010

At the time of writing, 1,120 contracts had been identified, which compared with 1,056 in the 2009 edition, 935 in 2008, 818 in 2007 and just 548 contracts which were identified for the 2006 edition. In addition, 18 industrial water/effluent contracts were removed from the database, to reflect its primary purpose of identifying people served via municipal contracts, meaning that 84 new contract entries were made, either from new contract awards or contracts which had not previously been identified.

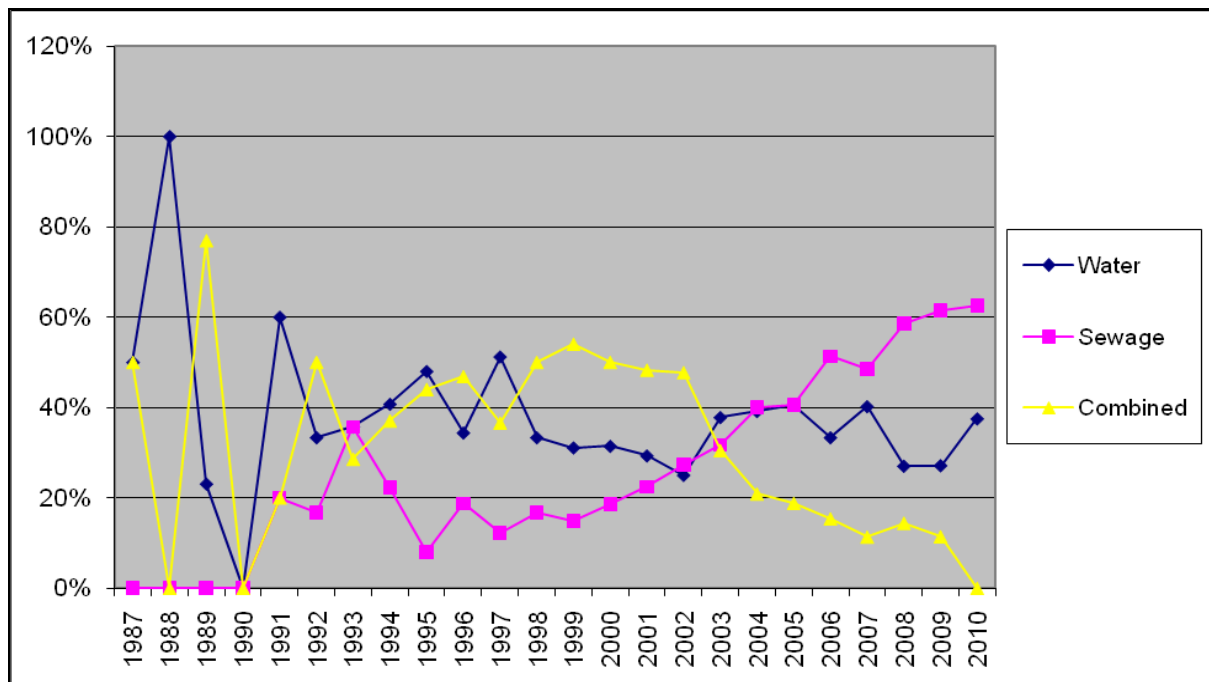
It is increasingly evident that contracts in certain countries (especially in China) are not being identified for some time after their initial award, along with new data sources becoming available. The number of Hong Kong, Singapore, Shanghai and Shenzhen listed companies posting full annual reports and regulatory updates continue to make a material impression here.

#### Frequency of contract awards, by year

	<b>Water</b>	<b>Sewage</b>	<b>Combined</b>	<b>Contracts</b>
1987	1	0	1	2
1988	1	0	0	1
1989	3	0	10	13
1990	0	0	0	0
1991	3	1	1	5
1992	2	1	3	6
1993	5	5	4	14
1994	11	6	10	27
1995	12	2	11	25
1996	11	6	15	32
1997	21	5	15	41
1998	10	5	15	30
1999	23	11	40	74
2000	22	13	35	70
2001	17	13	28	58
2002	11	12	21	44
2003	31	26	25	82
2004	45	46	24	115
2005	41	41	19	101
2006	26	40	12	78
2007	39	47	11	97
2008	30	65	16	111
2009	19	43	8	70
2010	9	15	0	24
<b>Total</b>	<b>393</b>	<b>403</b>	<b>324</b>	<b>1,120</b>

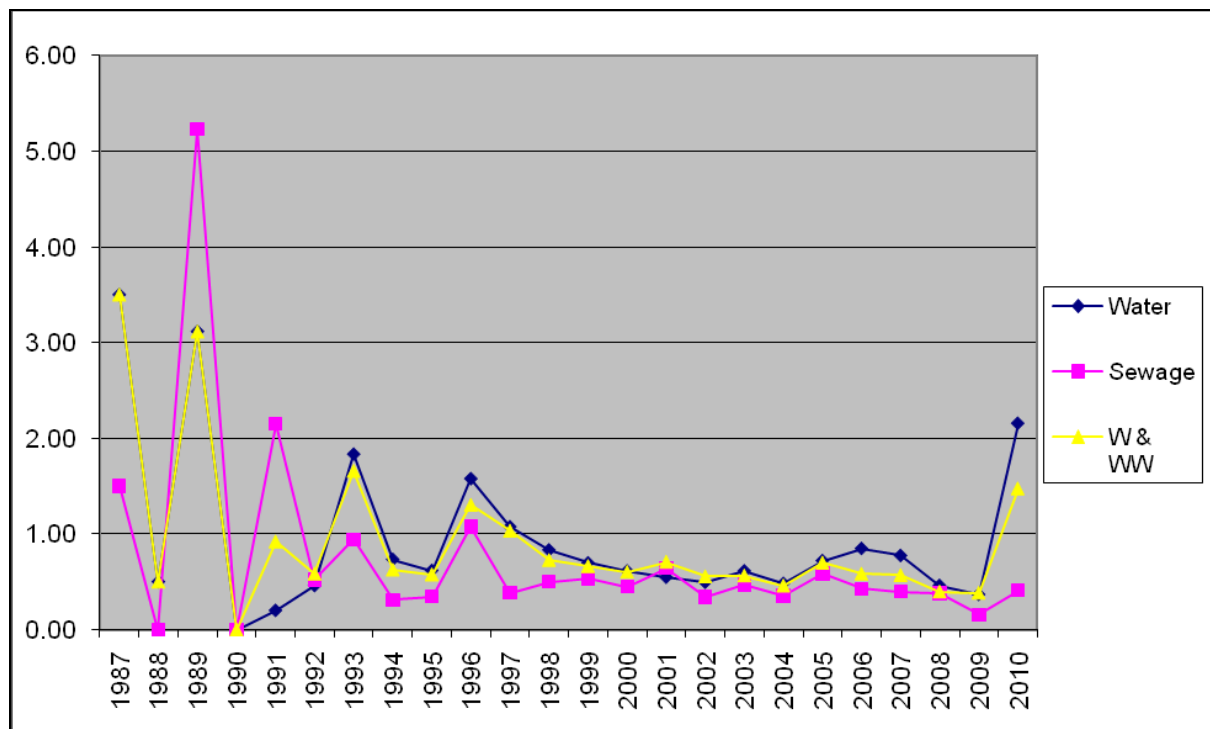
The increasing frequency of sewerage and sewage treatment contract awards since 1999 has been maintained. This has also been reflected by an increasing tendency for local companies to gain these contracts, which until 1995 were regarded as being almost exclusively the domain of companies operating in or from OECD economies.

**Graph: Contract award by type (% - 1987-10)**



**Average size of contract awards (millions of people)**

	Water	Sewage	W & WW
1987	3.50	1.50	3.50
1988	0.50	0.00	0.50
1989	3.12	5.23	3.12
1990	0.00	0.00	0.00
1991	0.20	2.15	0.92
1992	0.46	0.53	0.58
1993	1.83	0.94	1.66
1994	0.73	0.31	0.63
1995	0.62	0.35	0.58
1996	1.58	1.08	1.30
1997	1.08	0.39	1.03
1998	0.83	0.50	0.73
1999	0.70	0.53	0.66
2000	0.61	0.45	0.60
2001	0.55	0.64	0.71
2002	0.49	0.34	0.56
2003	0.61	0.47	0.56
2004	0.48	0.36	0.46
2005	0.72	0.59	0.70
2006	0.85	0.43	0.58
2007	0.77	0.40	0.57
2008	0.46	0.38	0.40
2009	0.37	0.16	0.38
2010	2.16	0.41	1.48
<b>Average</b>	<b>0.77</b>	<b>0.55</b>	<b>0.67</b>

**Graph: Average size of contract awards (millions of people)**

The volume of contracts remains high, underlining the development of local, small scale contract awards, especially for water. Wastewater only contracts continue to be scarcer, reflecting their lower perceived priority. Wastewater contracts tend to be smaller, due to a number of major bulk water contracts as well as sewerage services being less extensive than water provision services at the start of a typical privatisation. Even so, the gap has eased since 1998.

The average contract size has diminished since the 1990s, with the move away from mega-contracts to more local and possibly less contentious contracts. 1993, 1996 and 1997 for example are now remembered for Buenos Aires, Manila and Jakarta respectively, which with the exception of Manila Water have had their share of eventful moments. The jump in 2010 reflects the impact of the IPO of China's Chongqing Water Group (15million people currently served) and the Mexico City wastewater treatment concession, serving at least 10million people and a partial year of data.

### World Bank data - Where the money goes in the developing world

The World Bank's PPIAF 2010 water & sanitation sector review covers all loans for contracts in all developing economies between 1990 and 2008. All the data in this section is adapted from this report which is available on: [http://ppi.worldbank.org/explore/ppi\\_exploreSector.aspx?sectorID=4](http://ppi.worldbank.org/explore/ppi_exploreSector.aspx?sectorID=4).

### Overview of World Bank water & sewerage PSP lending, 1990 to 2010

Number of countries with private participation	62
Projects reaching financial closure	713
Region with largest investment share	East Asia & Pacific (48%)
Type of PPI with largest share in investment	Concessions (64%)
Type of PPI with largest share in projects	Greenfield projects (41%)
Projects cancelled or under distress	64 representing 34% of total investment

The distress level of 34% (29% in the 2008 survey) compares poorly with Electricity (8%), Telecoms (3%) and Transport (8%). It is also below the 31% level in 2006. While the quality of the World Bank's overall water and sewerage lending portfolio has improved in recent years (see the Appendices),

problems in South East Asia and Latin America are reflected in the very high rate of funding covered by projects either cancelled or under distress.

#### Cancelled or under distress projects and investment by region (USDmillion)

Region	Projects	Total Investment
East Asia and Pacific	29	11,600
Europe and Central Asia	2	8
Latin America & Caribbean	29	9,232
Middle East and North Africa	1	0
Sub-Saharan Africa	3	9
<b>Total</b>	<b>64</b>	<b>20,849</b>

The distress count has risen in Latin America with 29 projects against 25 in the previous year's survey. Two projects were cancelled in Argentina and three in Ecuador were classified as in distress.

#### Number of projects by region and year of financial closure

Financial closure	East Asia & Pacific	Europe & Cent Asia	Latin America	MENA	South Asia	Sub-Saharan Africa	Total
1991	0	0	1	0	0	1	2
1992	1	0	3	1	0	1	6
1993	3	2	6	0	0	1	12
1994	4	0	10	0	0	0	14
1995	4	1	10	0	0	1	16
1996	5	3	15	1	0	1	25
1997	14	0	22	0	0	0	36
1998	13	1	16	0	0	1	31
1999	8	2	21	2	0	5	38
2000	13	6	20	0	1	1	41
2001	13	5	17	0	1	4	40
2002	20	4	20	1	0	2	47
2003	26	9	8	1	0	1	45
2004	31	4	21	0	1	0	57
2005	46	6	6	4	1	1	64
2006	45	7	3	0	0	2	57
2007	62	3	7	3	5	2	82
2008	47	1	8	5	2	2	65
2009	29	0	3	2	1	0	35
<b>Total</b>	<b>384</b>	<b>54</b>	<b>217</b>	<b>20</b>	<b>12</b>	<b>26</b>	<b>713</b>

The number of projects invested in year by year has eased upwards, with a recent shift away from Latin America to East Asia and a constant level of activity for Eastern Europe and Central Asia. Projects classified as being closed in Europe and Central Asia fell from 61 to 50 between the 2008 and 2009 surveys.

**Investment in projects by region and year of investment (USDmillion)**

Year of investment	East Asia & Pacific	Europe & Cent Asia	Latin America	MENA	South Asia	Sub-Saharan Africa	Total
1991	0	0	75	0	0	0	75
1992	284	0	0	0	0	0	284
1993	2,558	0	4,071	0	0	0	6,629
1994	821	0	525	0	0	0	1,346
1995	520	0	1,293	0	0	0	1,823
1996	149	942	192	0	0	20	1,304
1997	8,033	0	1,933	0	0	0	9,966
1998	943	108	1,276	0	0	0	2,327
1999	273	6	6,011	0	0	82	6,372
2000	4,064	288	2,845	0	0	31	7,229
2001	673	300	1,165	0	2	3	2,143
2002	934	51	604	0	0	0	1,589
2003	697	324	296	169	0	9	1,494
2004	3,132	241	1,162	0	111	0	4,646
2005	1,341	440	190	510	0	0	2,481
2006	1,147	740	713	0	0	0	2,600
2007	1,902	609	662	230	142	121	3,426
2008	974	102	834	874	76	0	2,860
2009	524	0	15	1,419	24	0	1,982
<b>Total</b>	<b>28,968</b>	<b>4,151</b>	<b>23,622</b>	<b>3,202</b>	<b>355</b>	<b>266</b>	<b>60,564</b>

In contrast to the number of projects, actual funding mobilised through these projects has not recovered to the levels disbursed between 1993 and 2000, although it has bounced back from the 2001-02 low. While there was a fairly steady level of activity in Latin America, which has recently tailed off, the most dramatic decline has been in East Asia where funds were mobilised for major projects in, for example, the Philippines and Malaysia. In China, the shift has been towards local and expatriate funding.

**Number of projects by type of private participation**

Financial closure year	Concession	Divestiture	Greenfield Project	Management & Lease Contract	Total
1991	1	0	0	1	2
1992	2	0	2	2	6
1993	6	1	3	2	12
1994	8	0	5	1	14
1995	9	2	3	2	16
1996	7	1	10	7	25
1997	15	2	9	10	36
1998	18	1	10	2	31
1999	13	8	8	9	38
2000	30	1	5	5	41
2001	13	1	13	13	40
2002	27	3	8	9	47
2003	13	1	21	10	45
2004	31	0	22	4	57
2005	18	0	35	11	64
2006	16	2	30	9	57
2007	26	6	43	7	82
2008	17	2	42	4	65
2009	8	1	23	3	35
<b>Total</b>	<b>278</b>	<b>32</b>	<b>292</b>	<b>111</b>	<b>713</b>

The revised figures indicate that 13 new concessions awarded between 1991 and 2008 have been identified and added as well as three divestitures.

In terms of contracts awarded each year, numbers have been pretty steady since 1996. There has been an evident shift away from divestitures since the move in Chile away from outright privatisations to concessions from 2000, but they have not gone away as seen by the renewed activity in 2006-07.

#### Investment in projects by type of private participation (USDmillion)

Year of Investment	Concession	Divestiture	Greenfield Project	Management & Lease Contract	Total
1991	75	0	0	0	75
1992	284	0	0	0	284
1993	6,465	0	164	0	6,629
1994	966	0	380	0	1,346
1995	1,563	20	228	3	1,813
1996	122	36	1,125	20	1,304
1997	9,134	499	333	0	9,966
1998	1,676	266	385	0	2,327
1999	1,684	4,313	347	27	6,372
2000	6,134	456	633	7	7,229
2001	1,138	51	937	17	2,143
2002	1,032	323	232	1	1,589
2003	804	43	554	92	1,494
2004	3,370	210	1,046	20	4,464
2005	697	0	1,324	460	2,481
2006	1,222	383	423	572	2,600
2007	1,345	514	1,392	176	3,426
2008	825	290	1,744	0	2,860
2009	152	6	1,824	0	1,982
<b>Total</b>	<b>38,687</b>	<b>7,410</b>	<b>13,072</b>	<b>1,395</b>	<b>60,564</b>

Greenfield projects are less contentious than many as they do not directly affect people living there at the time. They are designed to serve companies seeking to operate in a newly designated zone and provide housing for staff attracted to these companies. The divestiture segment has been dominated by Chile, and has had a peripheral impact in recent years, with funding flows stemming from contracts awarded by 2000. Likewise, management and lease contracts are chiefly concerned with mobilising capabilities rather than funding. In relative terms, it is the Greenfield and management & lease contracts that have made the most progress in recent years, but from a low base and as peripheral sources of funding.

#### Number of projects by region and type

Region	Concession	Divestiture	Greenfield Project	Management & Lease Contract	Total
East Asia and Pacific	134	12	224	14	384
Europe and Central Asia	9	8	7	30	54
Latin America	130	12	44	31	217
M East & North Africa	0	0	11	9	20
South Asia	3	0	4	5	12
Sub-Saharan Africa	2	0	2	22	26
<b>Grand Total</b>	<b>278</b>	<b>32</b>	<b>292</b>	<b>111</b>	<b>713</b>

Management type contracts have been most popular in Sub-Saharan Africa, chiefly because of the difficulties in attracting full project funding there. In Europe and Central Asia, the management and lease contract is operated separately from funding, typically directed towards rehabilitating infrastructure. Concession and Greenfield contracts have been focussed on East Asia and Latin America, especially the major cities. This is particularly the case in China for Greenfield projects, strongly concurring with the author's observations.

#### Investment in projects by region and type (USDmillion)

Region	Concession	Divestiture	Greenfield project	Management & lease contract	Total
East Asia and Pacific	22,745	581	5,516	126	28,968
Europe and Central Asia	673	448	1,825	1,205	4,151
Latin America	15,085	6,381	2,152	4	23,622
M East & North Africa	0	0	3,202	0	3,202
South Asia	108	0	245	2	355
Sub-Saharan Africa	76	0	133	57	266
<b>Total</b>	<b>38,687</b>	<b>7,410</b>	<b>13,072</b>	<b>1,395</b>	<b>60,564</b>

The amount committed to Greenfield projects in the MENA region has nearly doubled, indicating the impact of recent projects areas such as in Egypt and Algeria. At the same time, a near halving in the overall funds associated with management and lease contracts highlights how these have been decoupled from project funding.

The lack of funding for projects in Sub-Saharan Africa and South Asia is telling. These are the two regions which are currently set to fail to reach the Millennium Development Goals. Europe has been marked by a big fall in concessions but a rise in management and lease contracts.

Sewerage and sewage treatment projects remain the least popular, partly due to the problems of gaining public support for projects where the benefits for extra costs cannot be directly discerned as with water provision projects.

#### Funding by sectoral activity

Subsector	Segment	Project Count	Total Investment
<b>Treatment plant</b>	Potable water & sewerage treatment plant	12	292
	Potable water treatment plant	136	10,382
	Sewerage treatment plant	250	5,204
<b>Total Treatment plant</b>		<b>398</b>	<b>15,878</b>
<b>Utility</b>	Sewerage collection	2	174
	Sewerage collection and treatment	10	2,571
	Water utility with sewerage	233	31,333
	Water utility without sewerage	70	10,428
<b>Total Utility</b>		<b>315</b>	<b>44,687</b>
<b>Grand Total</b>		<b>713</b>	<b>60,564</b>

Water and sewerage projects dominate in terms of funding mobilised because of a series of major projects in Asia and Latin America such as Santiago and Manila which were intended to cover the comprehensive rehabilitation and extension of a major city's water and sewerage services.

The shift (so to speak) towards sewerage is most pronounced in the treatment plant sector. Growth in concessions is appreciably slower than for treatment plants, at least in part reflecting the latter's better risk profile, whereby the more contact with the customer, the more politically contentious a project tends to be.

**Contract awards, 2008-10 (million people served)**

The table below summarises all contract awards identified by the author which have been awarded between the start of 2008 and September 2010. The list excludes contract awards that serve industrial clients alone, even where these contracts (especially in China) may serve domestic clients at a later date.

Year	Country	Location	Contract Company	Water	Sewage
2008	Algeria	Annaba & El Tarif	Gelsenwasser	1.000	1.000
2008	Australia	Townsville, Queensland	Mitsubishi	0.180	0.000
2008	Brazil	Alto Tiete, Sao Paulo	Cab Ambiental	1.500	0.000
2008	Brazil	Mirassol, Sao Paulo	Cab Ambiental	0.055	0.055
2008	Brazil	Guaratingueta, Sao Paulo	Cab Ambiental	0.000	0.116
2008	Brazil	Resende, Rio de Janeiro	Grupo Aguas do Brasil	0.112	0.112
2008	Brazil	Bahia, Salvador	Obrecht Engenharia Ambiental	0.000	1.100
2008	Brazil	Mogi Mirim, Sao Paulo	OHL	0.000	0.075
2008	Chile	Santiago	Cascal	0.100	0.000
2008	China	Kunming City, Yunnan Province	Anhui Guozhen Environmental Protection	0.000	0.100
2008	China	Tangshan County, Anhui Province	Anhui Guozhen Environmental Protection	0.000	0.100
2008	China	Zhoukou City, Henan Province	Asia Environment Holdings	0.000	0.600
2008	China	Danyang, Jiangsu	Asia Environment Holdings	0.500	0.000
2008	China	Xining, Qinghai	Asia Environment Holdings	0.000	0.750
2008	China	Hewenhu, Jiangxi	Beijing Capital	0.500	0.500
2008	China	Dongying, Shandong	Beijing Capital	0.650	0.650
2008	China	Guigang, Guanxi	Beijing Enterprises Water Group	0.400	0.000
2008	China	Jinan, Shandong	Beijing Enterprises Water Group	0.000	0.050
2008	China	Zhanhua, Shandong	Beijing Enterprises Water Group	0.000	0.075
2008	China	Qingdao, Shandong	Beijing Enterprises Water Group	0.000	0.200
2008	China	Tiazhou, Zhejiang	Beijing Enterprises Water Group	0.000	0.200
2008	China	Tiazhou, Zhejiang	Beijing Enterprises Water Group	0.000	0.250
2008	China	Guangzhou, Guangdong	Beijing Enterprises Water Group	0.000	0.500
2008	China	Zhaodong City, Heilongjiang Province	Beijing Herocan Environmental	0.000	0.500
2008	China	Daye City, Hubei Province	Beijing Sound	0.000	0.150
2008	China	Tianmen City, Hubei Province	Beijing Sound	0.000	0.750
2008	China	Lanzhou City, Gansu Province	Beijing Sound	0.000	0.500
2008	China	Foshan, Guangdong	Bio Treat Technology	0.000	0.250
2008	China	Xuancheng, Anhui	Bio Treat Technology	0.000	0.250
2008	China	Boxing, Shandong	China Everbright International	0.000	0.300



## PART 1: THE WORLD OF WATER 2010-2011

Year	Country	Location	Contract Company	Water	Sewage
2008	China	Jiangyin	China Everbright International	0.000	1.000
2008	China	Jinan 3, Shandong	China Everbright International	0.000	2.000
2008	China	Sunijiakou, Chongqing	China Water Affairs	0.150	0.000
2008	China	Xinyu, Jiangxi	China Water Affairs	0.750	0.000
2008	China	Daya Bay, Huizhou, Guangdong	China Water Affairs	1.700	0.000
2008	China	Yingtian City, Jiangxi Province	China Water Industry Group	0.200	0.000
2008	China	Guangrao County, Shandong	Chongqing Kangda Environmental	0.000	0.250
2008	China	Haerbin City, Heilongjiang Province	Chongqing Kangda Environmental	0.000	0.750
2008	China	Zhuanghe City, Liaoning Province	Dalian Dongda Environmental	0.000	0.150
2008	China	Mudanjiang District, Heilongjiang	Dalian Dongda Environmental	0.000	0.100
2008	China	Muling City, Heilongjiang Province	Dalian Dongda Environmental	0.000	0.100
2008	China	Nanjing County, Fujian Province	Easen International	0.000	0.050
2008	China	Jintan City, Jiangsu Province	Golden State Environment	0.000	0.150
2008	China	Debao County, Guangxi Province	Guangxi Huahong Water Affairs	0.000	0.075
2008	China	Cenxi City, Guangxi	Guangxi Huahong Water Affairs	0.000	0.150
2008	China	Fushui County, Guangxi Province	Guangxi Huahong Water Affairs	0.000	0.200
2008	China	Shuangyashan City, Heilongjiang	Haerbin Wanxinglong Co	0.000	0.250
2008	China	Shizong County, Yunnan Province	Hans Technologies	0.000	0.150
2008	China	Yiliang, Yunnan	Han's Technologies	0.000	0.100
2008	China	Ninghua, Fujian	Han's Technologies	0.000	0.150
2008	China	Cangwu, Guangxi	Han's Technologies	0.000	0.250
2008	China	Minguan, Anhui	Hyflux	0.100	0.000
2008	China	Minguan, Anhui	Hyflux	0.000	0.150
2008	China	Dingzhou City, Hebei Province	Kardan Water International Group	0.000	0.200
2008	China	Taojiang County, Hunan Province	Lianheruitong Water	0.000	0.100
2008	China	Sishui County, Shandong Province	Long Quan Group	0.000	0.100
2008	China	Jiangkou, Guangdong	Ming Hing Water	0.080	0.000
2008	China	Haerbin City, Heilongjiang Province	North America Environmental Tech	0.000	0.500
2008	China	Haerbin City, Heilongjiang Province	North America Environmental Tech	0.000	0.750
2008	China	Lushan	Puncak Niaga	0.021	0.000
2008	China	Lishui	Qianjiang Water Res	1.000	0.000
2008	China	Yizheng, Jiangsu	Salcon	0.100	0.000
2008	China	Changle County, Shandong	Salcon	0.200	0.000
2008	China	Nan An, Fujian	Salcon	1.000	0.000

<b>Year</b>	<b>Country</b>	<b>Location</b>	<b>Contract Company</b>	<b>Water</b>	<b>Sewage</b>
2008	China	Zhumadian, Henan	SembCorp (Casal)	0.400	0.000
2008	China	Yancheng, Jiangsu	SembCorp (Casal)	0.600	0.000
2008	China	Shenzhen, Guangdong	Shanghai Industrial	0.000	1.500
2008	China	Shenyang City, Liaoning Province	Shenyang Zhenxing	0.000	0.250
2008	China	Yuanping, Shanxi	Sino-Dutch Water Investment Co	0.100	0.250
2008	China	Liaoyuan City, Jilin Province	Sinomem Technology	0.000	0.500
2008	China	Jinbian County, Shaanxi Province	Sound Global	0.000	0.075
2008	China	Zhijiang City, Hubei Province	Sound Global	0.000	0.150
2008	China	Chongqing	Suez Environnement	1.200	0.000
2008	China	Xian, Shaanxi	Tianjin Env Protection	0.000	1.000
2008	China	Changshu City, Jiangsu Province	Zhongchuang Water	0.000	0.150
2008	China	Geermu, Qinghai Province	China Water Industry Group	0.200	0.000
2008	China	Shenyang City	China Water Industry Group	0.250	0.000
2008	China	Tangshan, Shenzhen	China Water Industry Group	0.350	0.000
2008	China	Yunan County, Duyuan, Guangdong	China Water Industry Group	0.000	0.100
2008	China	Yunan County, Yiyuan, Guangdong	China Water Industry Group	0.000	0.100
2008	China	Boluo, Shenzhen	China Water Industry Group	0.000	0.150
2008	China	Huizhou No 4, Shenzhen	China Water Industry Group	0.000	0.150
2008	China	Huizhou No 6, Shenzhen	China Water Industry Group	0.000	0.150
2008	China	Sihui Urban, Shenzhen	China Water Industry Group	0.000	0.150
2008	China	Huidong, Shenzhen	China Water Industry Group	0.000	0.200
2008	China	Sihui South China, Shenzhen	China Water Industry Group	0.000	0.250
2008	China	Yunfu City, Guangdong	China Water Industry Group	0.200	0.300
2008	China	Baoji, Shenzhen	China Water Industry Group	0.000	0.500
2008	China	Shenzhen, Guangdong	China Water Industry Group	1.000	2.000
2008	Cyprus	Limassol	EVN	0.160	0.000
2008	Germany	Rheingau	Suez Env	0.079	0.079
2008	Guatemala	Izabal	SEINCO	0.030	0.030
2008	India	Mysore	JUSCO	0.800	0.000
2008	India	Kolkata	JUSCO	0.030	0.030
2008	India	Delhi	Suez Environnement	0.000	0.600
2008	India	Nagpur, Maharashtra	Veolia Environnement	0.650	0.000
2008	Indonesia	Tangerang	Acuatico	0.150	0.000
2008	Indonesia	Telang Kelapa	Cascal	0.030	0.000
2008	Ireland	Castlebar	Veolia Environnement	0.000	0.020
2008	Ireland	Mullingar	Veolia Environnement	0.000	0.028
2008	Italy	Monza	ASCM-AGAM	0.122	0.122
2008	Mauritius	Mauritius	Berlinwasser International	0.000	0.200
2008	Mexico	Guadalajara	Mitsui	0.000	1.000

<b>Year</b>	<b>Country</b>	<b>Location</b>	<b>Contract Company</b>	<b>Water</b>	<b>Sewage</b>
2008	Montenegro	Budva	EVN	0.015	0.000
2008	Portugal	Covhilla	AGS	0.055	0.055
2008	Portugal	Elvas	Aqualia (FCC)	0.023	0.023
2008	Russian Fed	Volgograd	IES Holding	1.000	1.000
2008	Saudi Arabia	Jeddah	Suez Environnement	3.000	3.000
2008	Singapore	Changi	SembCorp	0.400	0.000
2008	Spain	Almaden	AGS	0.009	0.000
2008	Spain	S Vincente	AGS	0.005	0.005
2009	Algeria	Magtaa	Hyflux	1.500	0.000
2009	Antigua	Antigua	SembCorp (Casal)	0.083	0.000
2009	Australia	Waikerie	Mitsubishi	0.000	0.002
2009	Australia	Berri Barmera	Mitsubishi	0.000	0.004
2009	Australia	Melbourne	Suez Environnement	1.200	0.000
2009	Australia	Adelaide	Acciona Agua	0.600	0.000
2009	Brazil	Colider	Cab Ambiental	0.030	0.030
2009	Brazil	Pontes de Lacerda	Cab Ambiental	0.040	0.040
2009	Brazil	Alta Floresta	Cab Ambiental	0.050	0.050
2009	Brazil	Aracoiaba	Grupo Aguas do Brasil	0.022	0.022
2009	China	Yueyang, Hunan	Asia Environment Holdings	0.350	0.250
2009	China	Mianyang, Sichuan	Beijing Enterprises Water Group	0.020	0.000
2009	China	Leiyang, Hunan	Beijing Enterprises Water Group	0.040	0.000
2009	China	Changping, Beijing	Beijing Enterprises Water Group	0.060	0.000
2009	China	Qingzhen, Guiyang	Beijing Enterprises Water Group	0.100	0.000
2009	China	Zhongye	Beijing Enterprises Water Group	0.210	0.000
2009	China	Yongzhou, Hunan	Beijing Enterprises Water Group	0.000	0.050
2009	China	Yongzhou, Hunan	Beijing Enterprises Water Group	0.000	0.050
2009	China	Pengzhou, Sichuan	Beijing Enterprises Water Group	0.000	0.075
2009	China	Yongzhou, Hunan	Beijing Enterprises Water Group	0.000	0.100
2009	China	Hezhou, Guangxi	Beijing Enterprises Water Group	0.120	0.120
2009	China	Guizhou, Yunnan	Beijing Enterprises Water Group	0.000	0.125
2009	China	Guizhou, Yunnan	Beijing Enterprises Water Group	0.000	0.150
2009	China	Qingbaijiang, Chengdu	Beijing Enterprises Water Group	0.000	0.200
2009	China	Shuangliu, Sichuan	Beijing Enterprises Water Group	0.000	0.200
2009	China	Foshan, Guangdong	Beijing Enterprises Water Group	0.000	0.250
2009	China	Nansha, Guangzhou	Beijing Enterprises Water Group	0.000	0.250

## PART 1: THE WORLD OF WATER 2010-2011

Year	Country	Location	Contract Company	Water	Sewage
2009	China	Huangyan, Zhejiang	Beijing Enterprises Water Group	0.000	0.400
2009	China	Chengdu, Sichuan	Beijing Enterprises Water Group	0.000	0.500
2009	China	Guangzhou, Guangdong	Beijing Enterprises Water Group	0.000	0.500
2009	China	Jinzhou, Liaoning	Beijing Enterprises Water Group	0.000	0.500
2009	China	Qiqihar	Beijing Enterprises Water Group	0.000	0.750
2009	China	Jinan 4, Shandong	China Everbright International	0.000	0.150
2009	China	Long County	China Everbright International	0.000	0.150
2009	China	Shangli, Jiangxi	China Water Affairs	0.100	0.000
2009	China	Ningxiang, Hunan	China Water Affairs	0.475	0.000
2009	China	Fenyi, Jiangxi	China Water Affairs	0.000	0.050
2009	China	Yanshan, Jiangxi	China Water Affairs	0.000	0.055
2009	China	Wannian, Jiangxi	China Water Affairs	0.000	0.075
2009	China	Zanyi, Yunnan	Han's Technologies	0.000	0.100
2009	China	Luancheng	Puncak Niaga	0.120	0.000
2009	China	Yulin	Sound Global	0.000	0.075
2009	China	Guangxi	Sound Global	0.000	0.150
2009	China	Shangluo	Sound Global	0.000	0.150
2009	China	Xian	Sound Global	0.000	0.150
2009	China	Anyang	Sound Global	0.000	0.250
2009	China	Hancheng	Sound Global	0.000	0.250
2009	China	Jianguyan	Sound Global	0.000	0.400
2009	China	Fushun	Sound Global	0.000	0.500
2009	China	Xian	Sound Global	0.000	0.500
2009	China	Jiling, Shandong	Zhongshan Public Utilities	2.000	0.000
2009	China	Huangshan, Anhui	Asia Environment Holdings	0.000	0.100
2009	China	Kunshan, Jiangsu	Beijing BCEG	0.000	0.190
2009	China	Guigang, Guangxi	Beijing Enterprises Water Group Ltd	0.440	0.440
2009	China	Lufeng, Yunnan	Han's Technologies	0.000	0.050
2009	China	Lai An, Anhui	Metronic	0.060	0.000
2009	China	Yueli, Chongqing	Suez Environnement	1.200	0.000
2009	China	Suzhou, Jiangsu	Suez Environnement	0.000	0.610
2009	Cyprus	Limassol	EVN	0.000	0.100
2009	Egypt	New Cairo	Aqualia	0.000	1.000
2009	India	Bhavnagar	Jindal Aquasource	0.000	0.200
2009	Italy	Aspem (Varese)	A2A	0.060	0.000
2009	Mexico	El Realito	Aqualia / ICA	0.850	0.000
2009	Mexico	Ciudad Juárez	Degrémont / Sumitomo	0.000	1.000
2009	Mexico	Guadalajara	Mitsui	0.000	3.000
2009	Peru	Taboada	ACS Cobra-Tedagua	0.000	3.000
2009	Philippines	Boracay	Manila Water	0.050	0.000
2009	Philippines	Laguna	Manila Water	0.150	0.000
2009	Qatar	Doha South	Veolia Water	0.000	0.500
2009	Taiwan	Taoyuan	Darco	0.000	0.075

Year	Country	Location	Contract Company	Water	Sewage
2010	Brazil	Blumenau	Foz do Brasil	0.000	0.300
2010	China	Jinzhou, Liaoning	Beijing Enterprises Water Group	0.500	0.000
2010	China	Jinan, Shandong	Beijing Enterprises Water Group	0.000	0.200
2010	China	Foshan, Guangdong	Beijing Enterprises Water Group	0.000	0.250
2010	China	Jiaozhou, Shandong	Beijing Enterprises Water Group	0.000	0.250
2010	China	Mianyang, Sichuan	Beijing Enterprises Water Group	0.000	0.250
2010	China	Jinzhou, Liaoning	Beijing Enterprises Water Group	0.000	0.500
2010	China	Qi Qi Har, Heilongjiang	Beijing Enterprises Water Group	0.000	0.500
2010	China	Shenzhen, Guangdong	Beijing Enterprises Water Group	0.000	2.000
2010	China	Yongchuan, Chongqing	China Water Affairs	0.050	0.000
2010	China	Gaoan, Jiangxi	China Water Affairs	0.400	0.000
2010	China	Zhengcheng, Guangdong	China Water Affairs	0.750	0.000
2010	China	Wuzhou, Guangxi	China Water Affairs	1.580	0.000
2010	China	Chongqing	Chongqing Water Group	12.500	0.000
2010	China	Fushun	Sound Global	0.000	0.500
2010	China	Luohe	Sound Global	0.000	0.200
2010	China	Yantai	Sound Global	0.000	0.250
2010	Germany	Bad Breisig	Suez Environnement	0.013	0.000
2010	India	Bangalore	Suez Environnement	3.000	0.000
2010	Ireland	Letterkenny	Severn Trent Response	0.000	0.025
2010	Ireland	Limerick	Severn Trent Response	0.000	0.080
2010	Israel	Soreq	IDE Technologies	0.650	0.000
2010	Mexico	Atotonilco	IDEAL / ICA / Atlatec / Acciona Agua	0.000	10.500
2010	Reunion	Reunion North	Veolia Water	0.000	0.160

### Contract losses

This is an attempt to outline all PSP awards that have been rescinded for whatever reason in recent years. Despite the excitable rhetoric of the anti-private sector lobbies, these contracts may end for quite prosaic reasons.

### Contracts ended unilaterally

Start	End	Country	Contract	Company	Water	WW
1995	1997	Argentina	Tucuman	Veolia Environnement	1.200	0.000
1999	2000	Bolivia	Cochabamba	Bechtel	0.558	0.000
1997	2001	Venezuela	Monogas	VE / FCC - Pro Activa	0.552	0.000
1999	2002	Argentina	Buenos Aires Province	Enron	2.500	0.000
1999	2002	Venezuela	Lara	Agval	1.100	0.000
2001	2003	Vietnam	Ho Chi Minh	Suez Environnement	1.000	0.000
1997	2004	Colombia	Bogotá	Suez Environnement	0.000	1.500
2002	2004	Colombia	Sabanagrande	Acuasasa	0.027	0.025

Start	End	Country	Contract	Company	Water	WW
2001	2004	Venezuela	Zulia	Tecvasa	3.500	0.000
2003	2005	Tanzania	Dar es Salaam	Biwater	0.750	0.000
2000	2005	Uruguay	Maldonado	Iberdrola	0.260	0.260
1998	2009	Argentina	Mendoza	SAUR	1.200	0.950
1998	2009	Argentina	Aguas de Salta	Latin Aguas	1.050	0.769
1995	2009	Hungary	Pecs	Suez Environnement	0.178	0.178
<b>Total</b>					<b>13.875</b>	<b>3.682</b>

In the cases of Tanzania and Bolivia, the contracts ended due to political pressures. Suez handed back the Puerto Rico contract (which has previously been handed back by VE) after being unable to renegotiate its terms and the Bogotá wastewater treatment works contract was pulled in circumstances that still remain unclear. In the US, the Allegheny-held utility was acquired by the municipality under 'eminent domain', whereby a municipality is allowed to buy a private sector utility irrespective of its performance. The Atlanta and Halifax contracts in the US and Canada were cancelled primarily due to political change and disputes about performance delivery. In the case of Halifax, a new contract was subsequently awarded to Suez. There is some uncertainty about the exact status of the Mendoza and Aguas de Salta concessions.

#### Contracts ended by negotiation

Start	End	Country	Contract	Company	Water	WW
1996	1999	Trinidad & Tobago	Trinidad & Tobago	Severn Trent	0.400	0.000
1994	2000	China	Shenyang, Liaoning	Suez Environnement	1.400	0.000
1993	2000	Malaysia	National - Sewerage	Indah	0.000	6.100
1991	2001	Cent African Empire	Bangui	SAUR	0.075	0.000
1995	2001	South Africa	Nkokobe	Suez Environnement	0.128	0.000
1999	2002	Argentina	Aguas de La Rioja	Latin Aguas	0.201	0.122
1997	2002	China	Binzhou, Shandong	Cathay International	0.250	0.000
1997	2002	China	Jinan, Shandong	Cathay International	2.550	0.000
1999	2002	Philippines	Magdalena Laguna	Benpres	0.010	0.000
1996	2003	Brazil	Itu, Sao Paulo	Carmargo Correa	0.000	0.110
1995	2003	China	Shanghai	BWI (RWE / VE)	1.300	0.000
1997	2003	China	Xian	Berlinwasser International	3.000	0.000
1998	2003	China	Yueyang, Hunan	Cheung Kong Infra	0.800	0.000
2003	2003	China	Nanchang, Jiangxi	Berlinwasser International	1.000	0.000
1994	2004	Brazil	Sao Carlos, Sao Paulo	Hidrogesp	0.025	0.000
2002	2004	China	Foshan, Guangdong	Amiantit	0.000	0.400
1999	2004	Thailand	Pathum Thani	Macquarie	0.800	0.000
1991	2005	Belgium	Flanders	Aquafin	0.000	3.800
2001	2005	Belize	Belize	Biwater	0.100	0.000
1992	2005	Mexico	Chihuahua	Atlatec	0.000	0.750
1996	2005	Mexico	Navojoa	Tribasa	0.100	0.000
1999	2005	Mexico	Peubla	Suez Environnement	0.000	0.200
1997	2005	Philippines	Maynilad Water	Suez Environnement	4.500	0.700
1993	2006	Argentina	Buenos Aires	Suez Environnement	7.700	0.000
1995	2006	Argentina	Santa Fe	Suez Environnement	1.800	0.000
2000	2006	Argentina	Aguas de Gran Buenos Aires	Grupo ACS	1.700	0.000
2000	2006	Argentina	Catamarca	VE / FCC - Pro Activa	0.200	0.000
1996	2006	China	Shenyang, Liaoning	China Water Co	0.740	0.000
1998	2006	China	Shaoxing, Zhejiang	China Water Co	0.800	0.000

Start	End	Country	Contract	Company	Water	WW
2000	2006	China	Changchun, Jilin	Cascal	0.000	2.500
2001	2006	China	Shanghai	SAUR	0.700	0.000
2004	2006	China	Xianyang, Shaanxi	Interchina Holdings	0.750	0.000
2005	2006	China	Zhuozhou, Hebei	Interchina Holdings	0.000	0.247
2004	2006	Mexico	Xalapa	Mitsui	0.000	0.400
1997	2007	Bolivia	La Paz & El Alto	Suez Environnement	1.400	1.000
<b>Total</b>					<b>32.429</b>	<b>16.329</b>

Negotiations can range from the despairing (Prime Utilities) to the constructive. It is understood that both Chinese contracts were exited for a profit and this was certainly the case when Severn Trent concluded fifteen years of involvement with Belgium's Aquafin.

Selangor is seeking to acquire various concessions back from private operators. This process had not been concluded at the time of writing. Other concessions may be developed by the state in the medium term.

#### Contracts ended at their expiry

Start	End	Country	Contract	Company	Water	WW
1994	1999	Colombia	Ocana	Empresa Servicios Ocana	0.079	0.070
1999	2001	Colombia	Ocana	Empresa Servicios Ocana	0.079	0.070
1993	2003	South Africa	Stutterheim	Suez Environnement	0.200	0.000
1999	2004	Turkey	ANTSU	Suez Environnement	0.535	0.535
1992	2004	Mexico	Toluca	Grupo Mexico de Desarrollo	0.000	0.500
2000	2005	Armenia	Yerevan	ACEA	0.900	0.900
1999	2005	Kenya	Malindi	Gauff Ingenieure	0.050	0.010
2000	2005	Zambia	Copper belt	Bouygues	0.300	0.300
2002	2006	Albania	Elbasan	Berlinwasser International	0.080	0.080
2001	2006	Brazil	Mirassol, Sao Paulo	Paz Gestao Ambiental	0.048	0.048
2000	2006	Jordan	Greater Amman	Suez Environnement	2.500	2.500
2001	2006	Russia	Syzran	Syzranvodokanal	0.186	0.000
2001	2006	South Africa	Johannesburg	Suez Environnement	0.500	0.000
2002	2007	Kosovo	Gjakova, Rahovec & Lumbhardi	Gelsenwasser	0.200	0.000
1993	2007	Mexico	Cuernavaca	USF / Siemens	0.000	0.000
2003	2008	Albania	Durrez, Fier, Lezhe	Berlinwasser / Amiantit	0.450	0.450
2004	2008	Albania	Kavaja	Amiantit	0.077	0.025
1994	2008	Mexico	Puerto Vallarta	Cascal	0.000	0.250
1999	2008	Mozambique	Urban	Aguas de Portugal / Mazi	0.750	0.000
1995	2009	Hungary	Kaposvar	Suez Environnement	0.075	0.075
1994	2009	Mexico	Hermosillo	Grupo Protexa	0.000	0.750
<b>Total</b>					<b>7.009</b>	<b>6.563</b>

Remarkably, given the media coverage, some contracts expire when their allotted time span has run its course. The Yerevan and Tirana contracts have been in turn replaced by successor contracts. Indeed, the secondary cities project for Mozambique was meant to expire in 2004, when it was given a three year extension to 2007 and a further one year extension after that.

Such events are a healthy reminder that a concession is not forever, it is in effect a slice of time and for a further slice to be gained, the contract has to have its evident charms for both parties. This will become a more regular feature in future years as the more contracts there are, the more contracts will in time end and the longer PSP is in operation, the more contracts will reach their expiry date.

While contracts ending unilaterally have an average duration of 5.0 years, those ending by negotiation last on average 6.4 years and those at their expiry date 7.4 years. The latter is affected by the number of short to medium term management contracts included.

### Major PSP contract losses, January 1997 to September 2010 (million people)

#### [1] Yearly totals (million people)

Year	Water	Sewerage	Overall
1997	1.2	0.0	1.2
1998	0.0	0.0	0.0
1999	0.5	0.1	0.5
2000	2.0	6.1	8.1
2001	0.8	0.1	0.8
2002	7.2	0.7	7.2
2003	7.3	0.1	7.4
2004	4.9	3.0	7.3
2005	7.0	6.9	11.7
2006	17.7	5.8	20.9
2007	1.6	1.0	1.6
2008	1.3	0.7	1.5
2009	0.0	0.0	0.0
2010	2.5	2.7	3.3
<b>Total</b>	<b>53.9</b>	<b>27.1</b>	<b>71.4</b>

#### [2] Cumulative total (million people)

Year	Water	Sewerage	Overall
1997	1.2	0.0	1.2
1998	1.2	0.0	1.2
1999	1.7	0.1	1.7
2000	3.6	6.2	9.7
2001	4.5	6.2	10.6
2002	11.6	6.9	17.7
2003	18.9	7.0	25.1
2004	23.8	10.0	32.4
2005	30.8	16.9	44.1
2006	48.5	22.7	65.0
2007	50.1	23.7	66.6
2008	51.4	24.4	68.1
2009	51.4	24.4	68.1
2010	53.9	27.1	71.4

#### [3] As a percentage of the population served by contracts identified at the time

Year	Water	Sewerage	Overall
1997	0.4%	0.0%	0.3%
1998	0.3%	0.0%	0.3%
1999	0.4%	0.0%	0.4%
2000	0.8%	1.9%	2.1%
2001	1.0%	1.8%	2.1%
2002	2.4%	1.9%	3.3%
2003	3.7%	1.8%	4.3%



Year	Water	Sewerage	Overall
2004	4.4%	2.4%	5.1%
2005	5.2%	3.8%	6.3%
2006	7.8%	4.8%	8.7%
2007	7.6%	4.8%	8.3%
2008	7.6%	4.6%	8.0%
2009	7.4%	4.5%	7.8%
2010	7.6%	4.9%	7.8%

Overall, 8% of contracts have expired in terms of populations served. It is nothing to celebrate, but it does serve as a reminder of the nature of this market. Water is an inherently more attritional and irrational subject than other utilities and the easing contract ending rate since 2006 offers some encouragement.

### Listed market entries since 1989

The two tables below outline those companies whose shares have been either listed following their sale by municipal (or state) holders or were previously held by private companies.

### Water utility privatisations, by country, 1989–2009

Company	Country	IPO date	Current status
Anglian Water	UK	1989	Taken private
Dwr Cymru Welsh Water	UK	1989	Not for profit (Glas Cymru Cyf)
Northumbrian Water	UK	1989	Acquired, re-listed
North West Water	UK	1989	Listed (UU)
Severn Trent Water	UK	1989	Listed
Southern Water	UK	1989	Bought, taken private and again
South West Water	UK	1989	Listed (Pennon)
Thames Water	UK	1989	Bought, taken private
Wessex Water	UK	1989	Bought (twice)
Yorkshire Water	UK	1989	Taken private
Aquafin	Belgium	1991	Bought back
SmVaK	Czech Rep	1993	Taken private, bought
SABESP	Brazil	1994	Listed
Prime Utilities	Malaysia	1994	Re-nationalised
AMGA	Italy	1996	Bought by Iride
Shanghai Industrial	China	1996	Listed
Suzhou New District	China	1996	Listed
East Water	Thailand	1997	Listed
ACEA	Italy	1999	Listed
ASCM Como	Italy	2000	Listed
EYDAP	Greece	2000	Listed (Athens Water)
Nanghai Development	China	2000	Listed
Beijing Capital	China	2000	Listed
Qianjiang Water Resources	China	2000	Listed
Acegas	Italy	2001	Listed
EYATH	Greece	2001	Listed
Aguas Andinas	Chile	2002	Listed
ASM Brescia	Italy	2002	Merged with AEM
PBA Holdings	Malaysia	2002	Listed
KPS	Malaysia	2003	Listed
Hera	Italy	2003	Listed
Meta Modena	Italy	2003	Bought by Hera
Tallinna Vesi	Estonia	2005	Listed
Manila Water	Philippines	2005	Listed
Jiangxi Hongcheng	China	2004	Listed

Company	Country	IPO date	Current status
COPASA	Brazil	2006	Listed
Chongqing Water Group	China	2010	Listed

#### Market listings of private water utility companies, by country, 1991–2009

Company	Country	IPO date	Current status
South Staffordshire	UK	1991	Demerged, taken private
Puncak Niaga	Malaysia	1997	Listed
Intan Utilities	Malaysia	1997	Listed
Darco Water Tech	Singapore	2002	Listed
Goldis	Malaysia	2002	Listed
Eco Water	Singapore	2003	Listed
Salcon	Singapore	2003	Listed
Asia Env Holdings	Singapore	2004	Listed
Bio Treat Technologies	Hong Kong	2004	Listed
Pure Cycle	USA	2004	Listed
Cascal	UK	2008	Acquired by SembCorp in 2010
Thai Tap	Thailand	2008	Listed

During the past three years, Thai Tap was partly spun off from CK Carnchang, Cascal partly spun off from Biwater, American Water Works was spun off from RWE and Suez Environnement from GDF Suez, as was Veolia Environnement from Vivendi earlier in the decade. In India, VA Tech Wabag's IPO will be completed by the end of 2010.

#### The big three (or five) diminish

In 2002 the author declared that the acquisition of market share by the leading five companies was a 'remorseless' process. It is evident that when events turn against them, a retreat may be equally remorseless.

#### People served by company (million)

	1999	2001	2003	2005	2007	2009	2010
Suez	81.7	94.7	104.2	104.5	100.4	90.0	87.9
Veolia	74.8	95.2	104.5	117.5	133.9	122.4	124.4
SAUR	27.6	30.4	34.0	13.7	13.6	12.3	12.3
Agbar	31.2	35.3	35.2	34.9	22.1	29.7	29.5
RWE	23.7	56.5	70.1	67.2	35.7	18.3	18.3
<b>Total</b>	<b>239.0</b>	<b>312.1</b>	<b>348.0</b>	<b>337.8</b>	<b>305.7</b>	<b>272.7</b>	<b>272.4</b>
<b>Global</b>	<b>350</b>	<b>430</b>	<b>490</b>	<b>565</b>	<b>681</b>	<b>802</b>	<b>861</b>
<b>% by above</b>	<b>68%</b>	<b>73%</b>	<b>71%</b>	<b>60%</b>	<b>45%</b>	<b>34%</b>	<b>32%</b>

These are net of cross-holdings, so Suez Environnement does not include Agbar.

While a retreat from the peak of 2002 has been an ongoing process, the splitting up of SAUR and Bouygues and the divestment of AWW, Thames Water and Thames Water International from RWE has ramped up these changes. AWW's sell off has been a gradual one, with deconsolidation taking place in 2009.

Putting these into context, FCC's recent expansion means it currently serves 27.3million people, making it larger than RWE and SAUR. Indeed, single country entities such as Brazil's SABESP (24million) are also larger than they once were. Four to six Chinese companies are well on the way to serving 15-20million people and Chongqing Water Group's potential customer base is already in excess of 30million.

## A new Top Sixteen

While population served is the most appropriate yardstick for municipal contracts, it does leave out industrial contracts and serving business parks and the such-like. One way to circumvent this is to consider how much water is provided and how much wastewater is treated. The table below was developed by the author (with thanks to Ian Elkins at Global Water Intelligence for the idea and some supporting data) as a first stab at ranking the leading companies in volumetric terms. Clearly it depends on data available and is therefore something of a work in progress. The starkest example of the need for quantifiable comparisons is Suez Environnement's stated volumes in comparison with Agbar and Veolia Environnement.

It will be intriguing to see how this table evolves, especially as it will mirror new factors such as changes in industrial demand and the ability of companies to extract more value from less water.

### Water distributed and wastewater treated (million m<sup>3</sup> per annum)

Company	Country	Year	Water	WW	Combined	Notes
Veolia Environnement	France	2008	7,421	5,217	12,638	
Suez Environnement	France	2009	2,588	1,978	4,566	
Aguas de Barcelona	Spain	2009	2,735	1,018	3,753	1
SABESP	Brazil	2009	1,630	1,373	3,003	2
Guangdong Investment	China	2009	1,993	N/A	1,993	
Shanghai Industrial	China	2009	N/A	N/A	1,973	
SembCorp	Singapore	2009	N/A	N/A	1,935	3
Thames Water	UK	2008-09	938	1,026	1,964	4
FCC	Spain	2008	976	505	1,481	5
American Water Works	USA	2009	1,476	-	1,476	
ACEA	Italy	2009	870	527	1,397	
Severn Trent	UK	2008-09	672	537	1,209	4
Tianjin Capital EP	China	2009	384	764	1,148	
United Utilities	UK	2008-09	661	449	1,110	4
COPASA	Brazil	2009	603	113	716	
Beijing Enterprises WG	China	2009	35	384	419	

Notes:

- 1 – Wastewater is for Spain and Chile only
- 2 – Net of wholesale water to other providers
- 3 – Includes Cascad
- 4 – England & Wales regulated activities
- 5 – Includes Proactiva

There is a material difference between the volumes actually treated or distributed and each company's capacity. Likewise the picture is being changed by the rapid development of new capacity. For example, Beijing Enterprises has a contract order pipeline bringing its potential capacity to some 2billion m<sup>3</sup> pa. Likewise, Mitsui, via its various minority stakes and the Hyflux Water Trust JV has a potential capacity of 2.9billion m<sup>3</sup> pa. Operating data is currently unavailable for Beijing Capital Co.

### THREE PERSPECTIVES ON CONTRACT AWARDS

The Envisager contract award database has been used to provide three perspectives on the patterns of contract awards: [1] by competing contract awards to local (one country only), regional (contract awards within a single geographical region) and global (contract awards in at least two regions); [2]

contract awards within the OECD's 30 member states and outside the OECD; and [3] comparing contract awards between those awarded to companies in their home country and to those based in other countries.

#### Contract awarded to companies operating in their home country

	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	5	11.7	13.5	11.7
1990-94	14	4.5	12.7	17.1
1995-99	63	60.2	29.3	60.7
2000-04	170	51.9	55.8	89.4
2005-09	266	65.5	74.9	122.0
2010	18	16.4	5.2	21.6
<b>Total</b>	<b>536</b>	<b>210.2</b>	<b>191.4</b>	<b>322.5</b>

#### Contracts awarded to companies active in a region

	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	2	3.3	2.5	3.3
1990-94	5	0.7	0.8	1.0
1995-99	15	3.8	4.0	5.0
2000-04	43	12.1	6.7	17.9
2005-09	81	12.0	16.2	26.3
2010	0	0.0	0.0	0.0
<b>Total</b>	<b>146</b>	<b>31.9</b>	<b>30.2</b>	<b>53.5</b>

#### Contracts awarded to companies active globally

	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	9	33.0	37.8	33.0
1990-94	33	29.8	6.4	30.3
1995-99	124	94.6	38.3	103.8
2000-04	153	79.1	42.9	97.2
2005-09	113	67.6	40.5	96.1
2010	6	3.0	10.8	13.8
<b>Total</b>	<b>438</b>	<b>307.1</b>	<b>176.7</b>	<b>374.2</b>

#### Summary of contract awards

	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	16	48.0	53.8	48.0
1990-94	52	35.0	19.9	48.4
1995-99	202	158.6	71.6	169.5
2000-04	366	143.1	105.4	204.5
2005-09	460	145.1	131.6	244.4
2010	24	19.4	16.0	35.4
<b>Total</b>	<b>1120</b>	<b>549.2</b>	<b>398.3</b>	<b>750.2</b>

#### Contract awards - % of population served for water

	<b>1985-89</b>	<b>1990-94</b>	<b>1995-99</b>	<b>2000-04</b>	<b>2005-09</b>	<b>2010</b>	<b>Total</b>
National – Water	24%	13%	38%	36%	45%	85%	38%
Regional – Water	7%	2%	2%	8%	8%	0%	6%
International – Water	69%	85%	60%	55%	47%	15%	56%

**Contract awards - % of population served for sewerage**

	1985-89	1990-94	1995-99	2000-04	2005-09	2010	Total
National – WW	25%	64%	41%	53%	57%	33%	48%
Regional – WW	5%	4%	6%	6%	12%	0%	8%
International – WW	70%	32%	53%	41%	31%	68%	44%

**Contract awards - % of population served for both**

	1985-89	1990-94	1995-99	2000-04	2005-09	2010	Total
National – Total	24%	35%	36%	44%	50%	61%	43%
Regional – Total	7%	2%	3%	9%	11%	0%	7%
International – Total	69%	63%	61%	48%	39%	39%	50%

The 1985-89 figures were inevitably distorted by the England and Wales WaSC privatisation. As the English & Welsh WaSCs were all local companies at the time of their classification, they are classified as such, irrespective of their subsequent international ambitions. Again, sewerage for 1990-94 was affected by the ill-fated Malaysian national sewerage PSP. These excepted, there appears to be a gradual shift from the international to the local company award. Regional players have remained somewhat peripheral, although less so for sewerage than for water.

**The OECD and the rest of the world**

The 30 OECD member countries dominated the global market in the decade from 1985-94. Their market share in terms of where contract awards are being made has been almost peripheral in recent years.

**OECD and Rest of the World contract awards**

OECD	Member				Not Member				Total			
	N	Water	WW	Both	N	Water	WW	Both	N	Water	WW	Both
1985-89	10	39.2	52.3	39.2	6	8.8	1.5	8.8	16	48.0	53.8	48.0
1990-94	30	16.4	13.1	23.5	22	18.6	6.8	24.8	52	35.0	19.9	48.3
1995-99	81	24.2	23.5	32.7	121	134.5	48.2	136.7	202	158.7	71.7	169.4
2000-04	111	23.1	28.2	33.8	255	120.1	77.2	170.7	366	143.2	105.4	204.5
2005-09	57	11.3	8.7	14.6	403	133.8	122.9	229.8	460	145.1	131.6	244.4
2010	4	0.0	0.3	0.3	20	19.4	15.7	35.1	24	19.4	16.0	35.4
<b>Total</b>	<b>293</b>	<b>114.2</b>	<b>126.1</b>	<b>144.1</b>	<b>827</b>	<b>435.2</b>	<b>272.3</b>	<b>605.9</b>	<b>1120</b>	<b>549.4</b>	<b>398.4</b>	<b>750.0</b>

Chile joined the OECD in 2010, but is classified as outside the OECD for all contracts awarded prior to this.

**Home and abroad – domestic and international contract awards**

This table compares the numbers of people served by new contracts by companies in their country of origin (e.g. a WaSC in England & Wales gaining a sewage contract in Scotland, all being within the UK) whether local, regional or international companies and those awarded to countries operating outside their country of domicile. With the exception of international awards for water services during the 1990s (driven by Chile, Argentina, the Philippines and Indonesia) the majority of contract awards in population terms have been to home companies.

**Contracts awarded in a company's home country or internationally**

Award	Home				International				Total			
	N	Water	WW	Both	N	Water	WW	Both	N	Water	WW	Both
1985-89	12	41.8	52.3	41.8	4	6.2	1.5	6.2	16	48.0	53.8	48.0

Award	Home				International				Total			
1990-94	15	5.1	13.2	17.7	37	29.9	6.7	30.6	52	35.0	19.9	48.3
1995-99	74	68.8	38.0	70.8	128	89.9	33.7	98.6	202	158.7	71.7	169.4
2000-04	187	59.9	70.7	96.1	179	83.3	25.1	108.4	366	143.2	95.8	204.5
2005-09	271	72.8	76.0	129.2	189	72.2	55.6	115.2	460	145.0	131.6	244.4
2010	18	16.4	5.2	21.6	6	3.0	10.8	13.8	24	19.4	16.0	35.4
<b>Total</b>	<b>577</b>	<b>264.8</b>	<b>255.4</b>	<b>377.2</b>	<b>543</b>	<b>284.5</b>	<b>133.4</b>	<b>372.8</b>	<b>1120</b>	<b>549.3</b>	<b>388.8</b>	<b>750.0</b>

### International investment strategies of leading water companies

The caution of recent years has been maintained, except for a general interest in the Chinese market and developed country markets. The latter is of interest given the low proportion of contract awards noted in OECD countries in recent years.

Company	Strategy
Suez	Withdrawn from most developing economies save MENA & China
Veolia	Concentrating on Europe, China and selected markets
RWE	Withdrawn from all markets except Germany and Central Europe
SAUR	Concentrate on Europe
Agbar	Withdrawal from most of Latin America, investing in Europe, MENA and China
FCC	Retain some Latin American activities, invest in Europe, MENA and China
ACEA	Maintain international activities but no new projects
AECOM	Selective return to the market under consideration
AWG	All international activities (except Ireland) have been sold
Severn Trent	Maintain asset operation strategy (no capital expenditure)
UU	Withdrawn from all non UK activities
Bouygues	Maintain activities in former French Africa
Biwater	Unlikely to develop new projects post Cascad
SembCorp	Use Cascad to seek suitable contracts globally

### The BRICs build their presence

In previous editions, the rise of China has been noted. It is evident that the BRIC (Brazil, Russia, India and China) acronym has an increasing global resonance as well. In particular, India and Russia are now developing at a rate which may not have been foreseen a few years ago.

### Contract awards (millions of people served)

Brazil	N	Water	WW	Both
1985-89	0	0.0	0.0	0.0
1990-94	4	0.1	0.1	0.2
1995-99	24	39.0	26.6	39.3
2000-04	23	2.1	1.8	3.4
2005-09	15	14.0	8.2	15.5
2010	1	0.0	0.3	0.3
<b>Total</b>	<b>67</b>	<b>55.2</b>	<b>37.0</b>	<b>58.7</b>

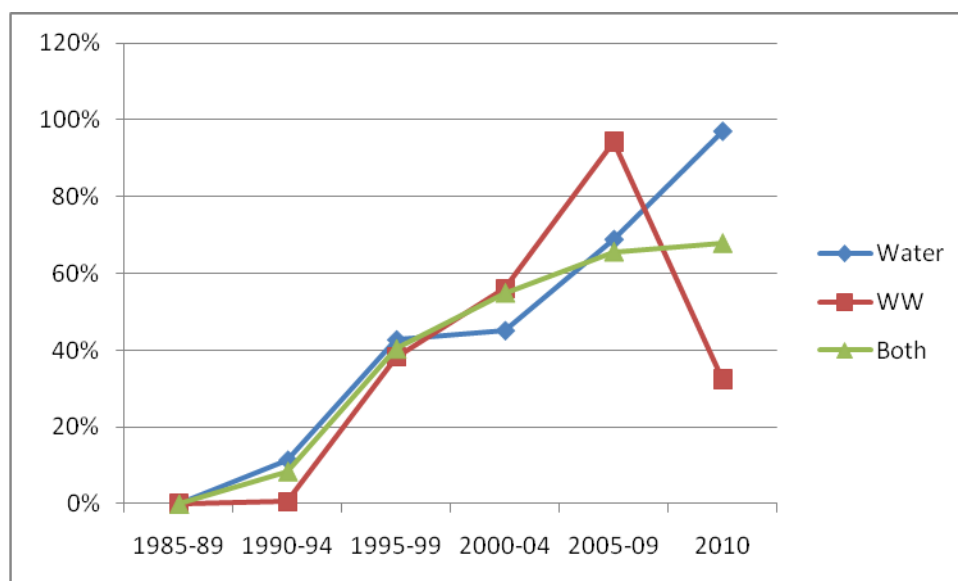
China	N	Water	WW	Both
1985-89	0	0.0	0.0	0.0
1990-94	4	3.9	0.0	3.9
1995-99	24	28.7	0.5	28.7
2000-04	128	54.2	51.1	95.1
2005-09	299	70.9	128.4	128.4
2010	16	15.8	4.9	20.7
<b>Total</b>	<b>471</b>	<b>173.5</b>	<b>184.9</b>	<b>276.8</b>

India	N	Water	WW	Both
1985-89	0	0.0	0.0	0.0
1990-94	0	0.0	0.0	0.0
1995-99	0	0.0	0.0	0.0
2000-04	5	2.8	5.1	7.9
2005-09	13	7.4	1.4	8.8
2010	1	3.0	0.0	3.0
<b>Total</b>	<b>19</b>	<b>13.2</b>	<b>6.5</b>	<b>19.7</b>

Russia	N	Water	WW	Both
1985-89	0	0.0	0.0	0.0
1990-94	0	0.0	0.0	0.0
1995-99	1	0.0	0.3	0.3
2000-04	11	5.4	1.1	5.8
2005-09	10	7.5	3.4	7.5
2010	0	0.0	0.0	0.0
<b>Total</b>	<b>22</b>	<b>12.9</b>	<b>4.8</b>	<b>13.6</b>

BRICs	N	Water	WW	Both
1985-89	0	0.0	0.0	0.0
1990-94	8	4.0	0.1	4.1
1995-99	49	67.7	27.4	68.3
2000-04	167	64.5	59.1	112.2
2005-09	337	99.8	141.4	160.2
2010	18	18.8	5.2	24.0
<b>Total</b>	<b>579</b>	<b>254.8</b>	<b>233.2</b>	<b>368.8</b>

**Percentage of global contracts in population terms awarded in BRIC countries**



**Contract awards to local and international companies (millions of people served)**

Brazil	National			International				
	N	Water	WW	Both	N	Water	WW	Both

<b>Brazil</b>	<b>National</b>				<b>International</b>			
1985-89	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1990-94	3	0.1	0.0	0.1	1	0.0	0.1	0.1
1995-99	17	29.3	21.1	29.6	7	9.7	5.4	9.7
2000-04	20	1.1	1.6	2.3	3	1.0	0.8	1.6
2005-09	14	14.0	7.6	14.9	1	0.0	0.1	0.1
2010	1	0.0	0.3	0.3	0	0.0	0.0	0.0
<b>Total</b>	<b>55</b>	<b>44.5</b>	<b>30.6</b>	<b>47.2</b>	<b>12</b>	<b>10.7</b>	<b>6.4</b>	<b>11.5</b>

Outside the late 1990s, the Brazilian market has been a local one, highlighted by the transfer of activities back from international players (e.g. Veolia, AWG and Earth Tech) over the past decade.

<b>China</b>	<b>National</b>				<b>International</b>			
	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1990-94	0	0.0	0.0	0.0	4	3.9	0.0	3.9
1995-99	10	13.9	0.4	13.9	14	15.6	0.2	15.6
2000-04	70	22.2	39.0	54.8	58	39.5	14.4	49.7
2005-09	213	41.2	136.6	143.5	86	25.9	21.8	45.1
2010	16	15.8	4.9	20.7	0	0.0	0.0	0.0
<b>Total</b>	<b>309</b>	<b>93.1</b>	<b>180.9</b>	<b>232.9</b>	<b>162</b>	<b>84.9</b>	<b>36.4</b>	<b>114.3</b>

China remains a key target market for international companies. Even so, the scale of activity by local companies has overshadowed such activities since 2005.

<b>India</b>	<b>National</b>				<b>International</b>			
	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1990-94	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1995-99	0	0.0	0.0	0.0	0	0.0	0.0	0.0
2000-04	4	1.2	0.3	1.4	1	1.6	0.0	1.6
2005-09	9	2.6	0.8	3.4	4	4.8	0.6	5.4
2010	0	0.0	0.0	0.0	1	3.0	0.0	3.0
<b>Total</b>	<b>13</b>	<b>3.8</b>	<b>1.1</b>	<b>4.8</b>	<b>6</b>	<b>9.4</b>	<b>0.6</b>	<b>10.0</b>

India is one of the most international of markets, with a wide variety of companies having been seen looking to gain contracts there. While United Utilities has sold off its activities, Manila Water has entered the market and Suez and VE have widened their activities through a range of pilot water management projects.

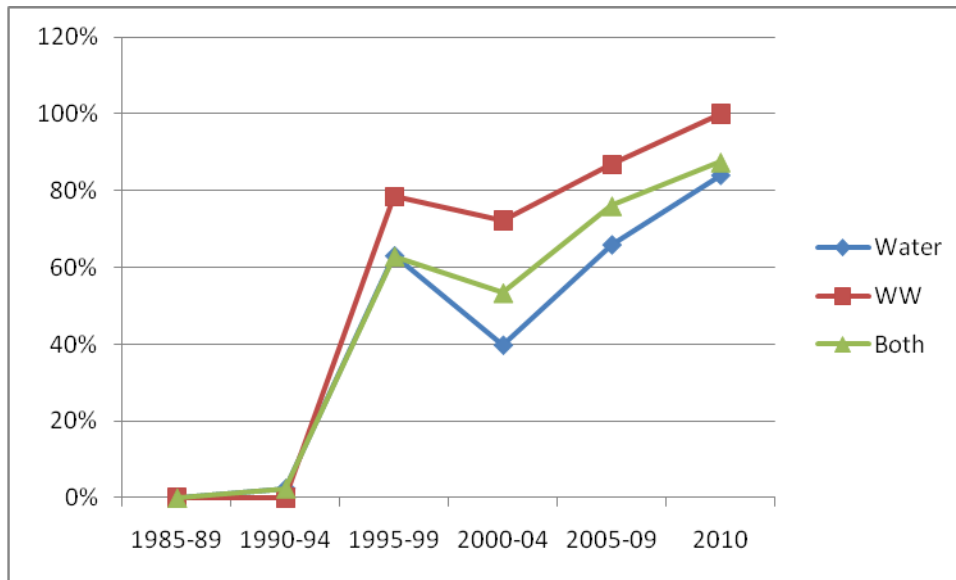
<b>Russia</b>	<b>National</b>				<b>International</b>			
	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1990-94	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1995-99	0	0.0	0.0	0.0	1	0.0	0.3	0.3
2000-04	7	4.2	0.5	4.2	4	1.3	0.7	1.7
2005-09	9	5.5	3.4	5.5	1	2.0	0.0	2.0
2010	0	0.0	0.0	0.0	0	0.0	0.0	0.0
<b>Total</b>	<b>16</b>	<b>9.7</b>	<b>3.9</b>	<b>9.7</b>	<b>6</b>	<b>3.3</b>	<b>1.0</b>	<b>4.0</b>

<b>All BRICs</b>	<b>National</b>				<b>International</b>			
	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>	<b>N</b>	<b>Water</b>	<b>WW</b>	<b>Both</b>
1985-89	0	0.0	0.0	0.0	0	0.0	0.0	0.0
1990-94	3	0.1	0.0	0.1	5	3.9	0.1	4.0



All BRICs	National				International			
1995-99	27	43.2	21.5	43.5	22	25.3	5.9	25.6
2000-04	101	28.7	41.4	62.7	66	43.4	15.9	54.6
2005-09	245	63.3	148.4	167.3	92	32.7	22.5	52.6
2010	17	15.8	5.2	21.0	1	3.0	0.0	3.0
<b>Total</b>	<b>393</b>	<b>151.1</b>	<b>216.5</b>	<b>294.6</b>	<b>186</b>	<b>108.3</b>	<b>44.4</b>	<b>139.8</b>

### Percentage of contract awards in BRIC companies going to national players



### THE ENGLISH & WELSH COMPANIES RETURN TO THEIR ROOTS

There has been an increasing focus on the regulated activities at the expense of the last eighteen years of diversification strategies. This reflects the influence of lower coupon debt and refinancing in relation to non core activities. Both AWG and Thames have spun off their non core activities now that they have been taken private. United Utilities substantially wrapped up the winding down of its non-core activities in 2010 with the sale of almost all of its international water operations, which will be reflected in the 2010-11 results.

Company FY 31/03	Non core revenues			Current activities
	2000	2005	2010	
AWG	16%	47%	23%	Infrastructure services
First Aqua	0%	0%	0%	Regulated activities only
Glas Cymru	63%	0%	0%	Regulated activities only
Kelda [1]	13%	16%	20%	Infrastructure services
Northumbrian [2]	14%	12%	7%	Peripheral non regulated
Pennon	40%	46%	59%	Waste management
Severn Trent	37%	51%	19%	Water & laboratory services
Thames	19%	55%	0%	Regulated activities only
UU	60%	52%	37%	Peripheral non regulated water activities
Wessex	0%	0%	0%	Regulated activities only

Notes:

[1] Kelda's 2010 figures are for 2008

[2] Northumbrian's 2000 figures are for the year ending 22 December 1988

### Private equity versus listed equity

The bids for AWG, Thames Water, Southern Water and Kelda in 2006-08 represented a dramatic continuation of a process that had been building momentum since 2000. In 2007, one broker had predicted there will be no listed companies by the end of 2008, a prediction which was as accurate as some of his colleagues' pronouncements about their understanding of risk management issues in the banking sector.

### Changes in the sector 2000-10 and possible changes to 2015

Company	2000-10 status	2010-15 changes
AWG	Listed, taken private (Osprey)	Private – medium term
Dwr Cymru	Went private (Glas Cymru)	Private – long term
Kelda	Listed, taken private (Saltire)	Private – medium term
Northumbrian	Re-listed (ex Suez)	Probably remain listed
Penon	Listed	Probably remain listed
Severn Trent	Listed	Remain listed
Southern	Taken over, then private (from RBS to JP Morgan)	Private – medium term
Thames	Acquired (RWE then taken private)	Private – long term
UU	Listed	Remain listed
Wessex	Re-acquired (Azurix to YTL)	Remain with YTL

While Ofwat maintains it is keen to have as many companies retaining a market listing, this carries little weight when the equity model can be materially less efficient than the debt one under the current regulatory settlement. This has been redoubled by Ofwat's proposals to introduce 'vertical competition' into the sector, although the momentum behind these proposals does appear to have eased during 2010. One of the key questions over the next few years will be how to encourage companies to return to the listed equity model, perhaps when the Private Equity players are seeking exits in a few years time.

### HOW MANY PEOPLE ARE SERVED BY THE PRIVATE SECTOR?

To gain a reasonable picture of the status of private sector participation in water and wastewater services requires a suitable set of operational assumptions that are robust enough to deal with the vagaries of the data that is currently available.

There are three quantifiable sets of data available:

- [1] Contract information at the time of the award
- [2] Published data on service extension and demand growth
- [3] Data about the current status of markets with a long-established private sector presence

In addition, populations grow within contract areas as a result of urban migration and indigenous population growth. This can be regarded as a contract's organic growth. These figures are extremely difficult to quantify where urbanisation involves people moving into informal settlements as the likelihood of any connection to a formal water service (let alone sanitation) is minimal unless a specific initiative (such as at La Paz in Bolivia by Suez) has been developed by a concession holder. As a result, population growth figures have been kept to a minimum.

For the sake of simplicity, all contracts that have subsequently been ended whether at the end of the contract life or prematurely, as a consequence of various externalities have been excluded from the ongoing picture. The major contract exits identified have been included in a separate table, as these have become a material factor over the past five years.

## How (and why) numbers served change

### Positive drivers:

**Privatisations and IPOs:** Contract awards (Tianjin Capital's contract gains in China since 2005), the acquisition of municipal service companies by private companies (ESSAR by Chile's Aguas Nevas) or stock market flotations (COPASA's IPO in 2006). In addition, privately held companies (Asia Environmental Holdings in Singapore in 2004) can be floated, bringing them to the public's attention.

**Acquisitions:** The acquisition of small privately held companies by larger entities. This is particularly notable in the USA, where there are many privately held companies serving 150 - 5,000 people and having a very low profile. Aqua America and AWW both pursue an aggressive tuck-in acquisition strategy, taking up 5,000-15,000 new customers each year this way. It is also seen in Italy and Greece, with ACEA actively seeking to take in the small municipalities in the Rome region.

**Service extension and population growth:** Water and sewerage services are extended to people who have previously relied on water vending or informal water supplies. New developments within a concession area are connected to the networks. Manila Water is an example of both.

### Negative drivers:

**Condemns and re-nationalisations:** The USA can be a surprisingly hostile place for the private sector. Municipalities can 'condemn' a regulated operator under 'Eminent Domain' law and seek to buy its assets from the owner as recently seen at Pennichuck, a case that is already generating useful attorney fees. In France concessions were nationalised as the political climate changed between 1918 and 1939 and Suez has lost two significant contracts since 2001. Paris is also in some form of public control but the status of this change is unclear as Veolia and Suez continue to manage many aspects of these services.

**Time:** Contracts do not last forever and there is no obligation to renew them at their expiry. Indeed, that can be the essence of a BOT contract. However, assets do not last forever and the need to upgrade, rehabilitate and extend assets points towards new contracts being awarded.

**Divestment:** Concessions being handed back as a company changes strategy (Suez in Puerto Rico), or judges that a contract has become inoperable (International Water in Bolivia). Companies can also be sold to municipalities when a parent company changes direction as seen with Allete's Florida water activities.

**Population decrease:** This will affect a number of concessions and companies in Europe in the longer term.

### People served by contract awards, 1987-2010

These databases exclude France, Spain (with two exceptions) and the USA due to the contract award details in these countries not being typically available and individually of a small and non-specific nature. The average contract award in France for example covers 2,000 people.

Not all water privatisations are fated to be subsumed within other companies, even though this sometimes appears to be the fate of the British water sector. In general, market listings to date have come about through government or municipal privatisations.

### Published data on service extension subsequent to the contract award

Examples of service extension identified include Metro Manila (water service extension by both concessions), and various contracts in Brazil, Malaysia and in Shanghai. In many cases the service extension seen to date is a partial picture.

### The long established markets

There were six markets with an extensive private sector presence in the start of 1987: the USA (mainly regulated activities, rather than the non-regulated O&M outsourcing contracts that have become a feature of the past decade); France (the private sector share has advanced from 72% in 1987 to 79% by 2005); Italy (11% of the market served by the private sector and semi-private companies in 1987); Spain (the private sector share has advanced from 35% in 1987 to 46% by 2005); Germany (Gelsenwasser and some local companies holding approximately 8% of the market through long term contracts) and England & Wales (there were 29 Statutory Water Companies serving 13.8million people in 1989).

Country	Comments	Million people
England & Wales	SWCs in operation in 1987	13.8
USA	Non-regulated activities	36.0
USA	Regulated activities	24.7
Germany	PSP since 1887	6.4
Italy	Mainly pre ATO contracts	6.5
Spain	PSP since 1867	23.0
France	PSP since 1853	45.5
<b>Total</b>		<b>154.9</b>

To count as private sector participation, contracts have to be of at least five years in duration and either a formally established O&M contract, a concessional contract or an outright asset privatisation. In this context, national private water service companies are defined as legal entities that have signed a formal contract with the relevant municipal or state authorities for the provision of water or wastewater services. In order to distinguish between such contracts and formal or quasi legal contracts drawn up with small local entities, these contracts also cover at least 10,000 people. Contracts for industrial water services or for developing industrial zones are excluded.

### A global figure

The uncorrected total feeds directly from the Envisager databases. It does not take into account all population growth within contract areas since the contract award date, nor all service extension work. Neither does it include small, formal PSP projects such as those highlighted by the 2006 World Bank study (Triche et al, 2006).

Contract type	Million people
Contract awards	750.5
Contract endings	-71.4
Incumbent markets	154.5
<b>Global total</b>	<b>834.1</b>

The contract service extension figure reflects the 2009 study by the World Bank which highlighted service gains for 24million people in 36 contracts. Wherever possible, service extension has already been factored in the data used and this is taken into account. Population growth and urbanisation data is very hard to qualify (it is steady or even falling in parts of Europe, while rising rapidly in many developing economies) and this may well be an understatement by 10-15million.

Contract type	Million people
Global total – uncorrected	834.1
Small formal PSP	5.0
Contract service extension	10.0
Population growth & urbanisation	12.5
<b>Global total – corrected</b>	<b>861.6</b>

The final figure compares with, for example 563million people as being identified as served by the private sector 2005. The rise both reflects improved data as well as contract awards in recent years.

## COMPANIES AND THEIR COVERAGE

This table outlines the number of people served by each country in their home and international markets. Wherever possible, it refers to actual companies rather than private equity holders.

When looking at the company entries and contract awards to date, the shift away from the global market leaders to more diverse and local management and financing solutions continues. These entries highlight the notable development of activities in the sector by companies based in China, Malaysia and Singapore. Other players are emerging across Latin America and in the Philippines and more recently India, thus compounding a trend away from European and Western company experience and finance operating globally towards more local applications.

### Size, home and abroad

The table below needs to be approached with some circumspection. While numbers served in 'home' contracts typically refer to contracts where the company has a majority holding of a concession, 'international' contracts (here defined as being outside the country of the company's registration) may well involve relatively small stakes. Where companies have minority shareholdings in contracts managed by other water companies, these have been ignored. These also exclude companies which only serve industrial water customers or where no reliable customer data is available.

Company	Home	International	Total	% Home
<b>Argentina</b>				
Latin Aguas	1,840,000	0	1,840,000	100%
<b>Australia</b>				
United Group	N/A	N/A	N/A	N/A
<b>Austria</b>				
Aquaplus	10,000	260,000	270,000	4%
Energie	150,000	780,000	930,000	16%
EVN	490,500	3,424,500	3,915,000	13%
<b>Brazil</b>				
Andrae Gutierrez	9,018,000	0	9,018,000	100%
CAB Ambiental	620,000	0	620,000	100%
COPASA	12,800,000	0	12,800,000	100%
Gruppo Aguas do Brasil	2,200,000	0	2,200,000	100%
Gruppo Equipav	1,490,000	0	1,490,000	100%
Riovivo	200,000	0	200,000	100%
SABESP	23,400,000	0	23,400,000	100%
<b>Canada</b>				
Aquatech	856,000	0	856,000	100%
North American Envirotech	0	1,300,000	1,300,000	0%
<b>Chile</b>				
Aguas Andinas [1]	6,591,000	0	6,591,000	100%
Aguas Neuvas	1,503,000	0	1,503,000	100%
Antofagasta	485,000	0	485,000	100%
ESSBIO	2,258,000	0	2,258,000	100%
ESVAL	1,902,000	0	1,902,000	100%
Nuevosur	650,000	0	650,000	100%
<b>China</b>				
Anhui Water Resources Development	1,600,000	0	1,600,000	100%
Beijing Capital	13,250,000	0	13,250,000	100%

<b>Company</b>	<b>Home</b>	<b>International</b>	<b>Total</b>	<b>% Home</b>
Beijing Enterprises Water Group	12,350,000	0	12,350,000	100%
Beijing Herocan	1,750,000	0	1,750,000	100%
Bio-Treat Technology	5,350,000	0	5,350,000	100%
Cathay International Water	4,000,000	0	4,000,000	100%
China Water Group	600,000	0	600,000	100%
China Everbright	6,100,000	0	6,100,000	100%
China Water Affairs	6,850,000	0	6,850,000	100%
China Water Industry	15,610,000	0	15,610,000	100%
Cheung Kong Infrastructure	0	329,000	329,000	0%
Chongqing Kanda Env	3,400,000	0	3,400,000	100%
Chongqing Water Group	15,000,000	0	15,000,000	100%
Citic Pacific	600,000	0	600,000	100%
Easen International	500,000	0	500,000	100%
Global Green Tech Group	800,000	0	800,000	100%
Golden State Environment	3,910,000	0	3,910,000	100%
Guangdong Golden Dragon	N/A	N/A	N/A	N/A
Guangdong Investment	5,800,000	0	5,800,000	100%
Guozhen Environmental Protection	6,333,000	0	6,333,000	100%
Heilongjiang Interchina Water Treatment	350,000	0	350,000	100%
Interchina Holdings	3,500,000	0	3,500,000	100%
Jiangxi Hongcheng Waterworks	1,550,000	0	1,550,000	100%
KWIG (Kardan NV)	1,200,000	0	1,200,000	100%
Ming Hing Waterworks	80,000	0	80,000	100%
Nanhai Development Ltd	1,100,000	0	1,100,000	100%
NWS Holdings	16,120,000	0	16,120,000	100%
Ningbo Fuda Company	150,000	0	150,000	100%
Galaxy Water	605,000	0	605,000	100%
Qianjiang Water Resources	1,315,000	0	1,315,000	100%
Shanghai Industrial Holdings	13,900,000	0	13,900,000	100%
Shanghai Chengtou	3,000,000	0	3,000,000	100%
Shanghai Urban Construction Group	2,000,000	0	2,000,000	100%
Shanghai Young Sun	500,000	0	500,000	100%
Shenzhen Kondarl	N/A	N/A	N/A	N/A
Sichuan Guangan AAA Public	100,000	0	100,000	100%
Sound Global	3,760,000	0	3,760,000	100%
Suzhou New District	100,000	0	100,000	100%
Tianjin Capital Environmental Protection	12,350,000	0	12,350,000	100%
Towngas (HK & China Gas & Light)	1,880,000	0	1,880,000	100%
Wuhan Sanzheng Industry Holdings	2,000,000	0	2,000,000	100%
Xin Jiang Hui Tong	780,000	0	780,000	100%
Zhongshan Public Utilities	2,490,000	0	2,490,000	100%
<b>Estonia</b>				
Tallinna Vesi	405,000	0	405,000	100%
<b>France</b>				
Alteau	250,000	0	250,000	100%
Bouygues	0	9,800,000	9,800,000	0%
SAUR	5,500,000	7,699,000	13,179,000	41%
Sogedo	225,000	0	225,000	100%
STGS	166,000	0	166,000	100%
Suez Environnement	12,300,000	105,109,00	117,409,000	10%
Ternois Epuration	100,000	0	100,000	100%

<b>Company</b>	<b>Home</b>	<b>International</b>	<b>Total</b>	<b>% Home</b>
VE	24,500,000	99,890,000	124,390,000	20%
<b>Germany</b>				
E.ON	N/A	0	N/A	N/A
Gelsenwasser	5,800,000	1,711,800	7,511,800	77%
MVV	990,000	0	990,000	100%
Remondis	540,000	4,020,000	4,560,000	12%
RWE	13,200,000	5,065,500	18,265,500	72%
<b>Greece</b>				
Athens Water	4,000,000	0	4,000,000	100%
Thessaloniki Water	850,000	0	850,000	100%
<b>India</b>				
BHEL	100,000	0	100,000	100%
IVRCL	1,100,000	0	1,100,000	100%
Jindal Aquasource	700,000	0	700,000	100%
JUSCO	1,830,000	0	1,830,000	100%
Larsen & Toubro	500,000	0	500,000	100%
VA Tech Wabag	600,000	0	600,000	100%
<b>Indonesia</b>				
Acuatico	2,850,000	0	2,850,000	100%
<b>Italy</b>				
A2A	900,000	0	900,000	100%
ACEA	9,750,000	5,195,000	14,945,000	65%
Acegas-APS	470,000	0	470,000	100%
Acque Potabili	1,200,000	0	1,200,000	100%
ASCM-AGAM	250,000	0	250,000	100%
Iride	5,090,000	0	5,090,000	100%
Hera	2,600,000	0	2,600,000	100%
Mediterranea delle Acque	330,000	0	330,000	100%
<b>Japan</b>				
Mitsubishi	0	1,985,000	1,985,000	0%
Mitsui	0	1,267,000	1,267,000	0%
<b>Kuwait</b>				
Utilities Development Company	1,900,000	0	1,900,000	100%
<b>Malaysia</b>				
Synergy Heights	N/A	0	N/A	N/A
Goldis	0	500,000	500,000	0%
Intan Utilities	600,000	0	600,000	100%
K P Selangor	500,000	0	500,000	100%
PBA Holdings	1,450,000	250,000	1,700,000	85%
PPB	0	250,000	250,000	0%
Puncak Niaga	7,100,000	0	7,100,000	100%
Ranhill Utilities	2,950,000	458,000	3,408,000	87%
Salcon	0	2,397,000	2,397,000	0%
Taliworks	2,045,000	200,000	2,245,000	91%
YTL Holdings	0	2,397,000	2,397,000	0%
<b>Mexico</b>				
Aquasol Morelia	500,000	0	500,000	100%
<b>Morocco</b>				
LYDEC	2,800,000	0	2,800,000	100%
<b>Philippines</b>				

<b>Company</b>	<b>Home</b>	<b>International</b>	<b>Total</b>	<b>% Home</b>
Benguet	250,000	0	250,000	100%
Manila Water	5,600,000	3,100,000	8,700,000	69%
Metro Pacific	5,900,000	0	5,900,000	100%
<b>Poland</b>				
Aquarius	52,000	0	52,000	100%
<b>Portugal</b>				
Mota-Engil	560,000	0	529,000	100%
<b>Russian Federation</b>				
Rosvodokanal	2,010,000	0	2,101,000	100%
RKS	3,745,000	0	3,745,000	100%
Syzran Vodokanal	186,000	0	186,000	100%
<b>Qatar</b>				
QEWEC	500,000	0	500,000	100%
<b>Saudi Arabia</b>				
Amiantit	40,000	1,040,000	1,080,000	4%
<b>Singapore</b>				
Asia Environment	0	4,350,000	4,350,000	0%
Asia Water Technology	0	2,960,000	2,960,000	0%
Boustead	0	550,000	550,000	0%
Darco	0	1,025,000	1,025,000	0%
Dayen	125,000	0	125,000	100%
Hyflux	700,000	3,500,000	4,200,000	17%
Keppel	100,000	0	100,000	100%
Salcon	0	3,820,000	3,820,000	0%
SembCorp	400,000	4,712,000	5,312,000	8%
Sinomem	0	1,260,000	1,260,000	0%
Sound Global	0	11,600,000	11,600,000	0%
<b>Spain</b>				
Acciona	1,700,000	0	1,700,000	100%
Agbar [2]	15,000,000	14,525,000	29,525,000	52%
Agval [3]	2,040,000	150,000	2,190,000	93%
FCC [4]	13,000,000	14,344,000	27,344,000	48%
Ferrovial	650,000	0	650,000	100%
Gruppo ACS	6,600,000	2,100,000	8,700,000	76%
OHL	650,000	3,750,000	4,400,000	15%
Sacyr Vallehermoso	837,150	1,829,000	2,666,150	31%
Tecasva	0	3,440,000	3,440,000	0%
<b>Sweden</b>				
Lackeby Water Group	0	250,000	250,000	0%
<b>Thailand</b>				
Thai Tap	1,200,000	0	1,200,000	100%
East Water	525,000	0	525,000	100%
<b>UK</b>				
AWG	5,792,000	1,250,000	7,042,000	82%
Biwater	0	2,000,000	2,000,000	0%
Costain	N/A	N/A	N/A	N/A
South Downs	657,000	0	657,000	100%
Dee Valley	258,000	0	258,000	100%
Glas Cymru	3,043,000	0	3,043,000	100%
East Surrey	560,000	0	560,000	100%
Kelda Group	5,993,000	0	5,993,000	100%



<b>Company</b>	<b>Home</b>	<b>International</b>	<b>Total</b>	<b>% Home</b>
Nature Technology Solutions	N/A	N/A	N/A	N/A
Northumbrian Water	6,296,000	246,000	6,542,000	96%
Pennon Group	1,516,000	0	1,516,000	100%
First Aqua	4,170,000	0	4,170,000	100%
Severn Trent	8,280,000	3,400,000	11,680,000	71%
South East Water	2,100,000	0	2,100,000	100%
South Staffordshire	1,233,000	0	1,233,000	100%
Thames Water (Macquarrie)	13,000,000	1,200,000	14,200,000	92%
United Utilities	7,250,000	0	7,250,000	100%
<b>USA</b>				
AECOM	0	766,000	766,000	0%
Alliance Water Resources	340,000	0	340,000	100%
American States	1,120,000	0	1,120,000	100%
Aqua America	3,000,000	0	3,000,000	100%
American Water Works	16,400,000	400,000	16,800,000	98%
Artesian	280,000	0	280,000	100%
Cadiz	N/A	0	N/A	N/A
California WS	2,180,000	0	2,180,000	100%
CH2M Hill	4,000,000	0	4,000,000	100%
Connecticut	300,000	0	300,000	100%
Consolidated Water	0	47,000	57,000	0%
Global Water Resources	110,000	0	110,000	100%
Han's Technologies	0	1,130,000	1,130,000	0%
Middlesex	450,000	0	450,000	100%
Pennichuck	140,000	0	140,000	100%
Pico Holdings	N/A	0	N/A	N/A
Pure Cycle	N/A	0	N/A	N/A
SJW	1,060,000	0	1,060,000	100%
Southwest	1,420,000	0	1,420,000	100%
Utilities Inc	1,050,000	0	1,050,000	100%
Western Water	N/A	0	N/A	N/A
York	180,000	0	180,000	100%

[1] Also included in Aguas de Barcelona [see Aguas Andinas, Chile]

[2] Also in Suez

[3] Now separate from SAUR

[4] VE and FCC share the Pro-Activa activities

### Companies covered by country

This excludes entries for companies only included in the country entries.

	<b>1999</b>	<b>2001</b>	<b>2003</b>	<b>2005</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Argentina	0	0	0	1	1	1	1	1
Austria	0	1	1	3	3	3	3	3
Australia	0	0	0	1	3	3	1	1
Belgium	1	1	1	1	0	0	0	0
Brazil	1	1	1	1	4	4	6	7
Canada	0	0	0	1	1	1	1	1
Chile	1	1	1	4	5	6	6	6
China	4	7	9	19	31	31	36	41
Czech Republic	1	1	0	1	0	0	0	0

	1999	2001	2003	2005	2007	2008	2009	2010
Estonia	0	0	0	1	1	1	1	1
France	3	3	3	4	4	4	4	4
Germany	5	5	4	4	5	5	5	4
Greece	0	2	2	2	2	2	2	2
India	0	0	1	3	3	4	4	6
Indonesia	0	0	0	0	0	0	1	1
Italy	5	8	12	7	9	9	8	8
Japan	0	0	0	0	0	1	1	2
Kuwait	0	0	0	0	1	1	1	1
Malaysia	3	2	10	11	11	11	11	11
Mexico	0	0	0	1	1	1	1	1
Morocco	0	0	0	1	1	1	1	1
Netherlands	0	1	1	1	0	0	0	1
Philippines	0	0	2	3	3	3	3	3
Portugal	0	0	0	1	1	1	1	1
Qatar	0	0	0	0	1	1	1	1
Saudi Arabia	0	0	0	1	1	1	1	1
Singapore	0	0	4	6	6	6	6	7
Spain	6	8	8	8	8	7	7	7
Sweden	0	0	0	1	1	1	1	1
Thailand	2	1	1	1	2	2	2	2
United Kingdom	18	15	18	19	15	15	18	17
USA	20	25	23	21	21	24	24	22

The table below summarises these results in terms of the number of companies identified, along with which countries they are based in.

	1999	2001	2003	2005	2007	2008	2009	2010
Number of countries	13	16	18	28	27	28	29	29
Number of companies	70	82	102	128	145	150	157	164
- OECD countries	59	70	73	77	75	78	77	75
- Advanced developing	2	2	6	13	19	20	22	24
- Developing	9	10	23	38	51	52	58	65

In 2010 Chile became a member of the OECD.

## COUNTRY MARKET DEVELOPMENT, PROSPECTS AND PROGNOSIS

### A new set of forecasts

The addressable population is the percentage of the population (2010 estimates) that the author believes have a better than even chance of being served with PSP water and/or sewerage provision by 2015. That may once have appeared a long way off, but it is not as distant as it may have seemed to have been in 1999 and it does allow for current political, regulatory and market trends to be translated into realistic market developments, while allowing for years of contract award and implementation slippage for political and economic changes.

The table below consists of a set of estimates for the current extent of private sector participation in water and sewerage services for the main markets, along with forecasts for the potential extent of private sector penetration by 2015 and 2025. Perhaps 25-30% of the market is 'suitable' for PSP in that PSP can offer genuine benefits to people under current conditions and those foreseeable in 2025. Almost all of this market is the urban market, meaning that by 2025, 45-55% of the urban market is potentially suitably placed for PSP.

## The potential for private sector participation

Not all markets are suitable for privatisation, even on a 25 or a 50 year view. Yet the only predictable element in the above statement is its inherent unpredictability. In 1999, 5% of the world's population was served to some extent by the private sector. Since 2006, this had increased to 10% of the world's population, to 11% between 2007 and 2009 and 12% in 2010.

## Current and forecast extent of private sector participation

What has been fascinating to observe is the steady development of numbers served and a series of forecasts for PSP coverage between 1999 and 2010 that have remained in a 15-17% range. Our revised forecast for the extent of PSP in 2015 is 1,201.8million, an upwards adjustment of 41million on the forecast made in 2007.

### 2015 forecasts (million people)

Year	Number	% of global population
2004	1,125	15%
2005	1,085	15%
2006	1,145	16%
2007	1,148	16%
2008	1,161	16%
2009	1,163	16%
2010	1,202	16%

The figures for privatisation to date demonstrate the variable progress that the private sector has made. In Western Europe, private sector service provision is already becoming commonplace, which can be related to the global domination of international markets by a number of companies from this region. The forecasts for most other regions with the exception of the Americas are on the cautious side for the time being. What is notable is the gap between the estimation of the addressable populations in the Americas and the extent of privatisation to date.

What has been consistently evident over the past years is that nothing can be taken for granted when it comes to assessing market developments and prospects. China was seen as something of interest in 1999, now it is the single most important global driver. The Russian Federation was seen as 'unsuitable before perhaps 2050' as recently as five years ago. Now a market is emerging, especially in Moscow and St. Petersburg. India was beyond most boundaries, characterised by blocked initiatives and mothballed plans. Now not only have a number of contracts been awarded since 2002, but also the new Congress Government has made it clear that PSP is to be highlighted as a method for mobilising new resources.

## Western Europe

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Austria	7%	0%	9%	12%	12%	17%
Belgium	3%	10%	3%	11%	3%	12%
Denmark	1%	0%	2%	2%	2%	2%
Finland	0%	1%	0%	2%	2%	2%
France	70%	52%	75%	71%	76%	76%
Germany	21%	18%	26%	29%	27%	31%
Greece	43%	37%	46%	45%	48%	48%
Ireland	1%	42%	17%	44%	25%	47%
Italy	40%	29%	53%	46%	59%	55%
Netherlands	0%	10%	0%	11%	0%	11%
Norway	6%	5%	5%	10%	8%	12%
Portugal	25%	23%	56%	51%	61%	56%

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Spain	40%	47%	63%	57%	64%	62%
Sweden	1%	1%	5%	5%	5%	5%
Switzerland	0%	0%	0%	0%	0%	0%
United Kingdom	87%	90%	94%	96%	94%	97%

### Central and Eastern Europe

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Albania	0%	5%	15%	30%	29%	31%
Armenia	61%	61%	73%	67%	76%	69%
Azerbaijan	1%	0%	6%	11%	11%	16%
Bulgaria	20%	16%	42%	49%	53%	53%
Croatia	0%	18%	22%	27%	27%	34%
Cyprus	0%	19%	19%	25%	38%	38%
Czech Republic	79%	74%	84%	79%	89%	87%
Estonia	31%	31%	38%	38%	42%	42%
Georgia	24%	0%	29%	12%	46%	38%
Hungary	27%	26%	36%	36%	37%	37%
Kosovo	11%	0%	13%	0%	16%	11%
Latvia	0%	0%	23%	23%	24%	24%
Lithuania	0%	0%	15%	0%	19%	19%
Moldova	18%	0%	19%	7%	29%	14%
Montenegro	25%	25%	25%	25%	33%	33%
Poland	3%	3%	11%	13%	16%	22%
Romania	11%	0%	19%	17%	26%	21%
Russian Federation	9%	4%	18%	15%	27%	20%
Slovakia	20%	20%	37%	37%	38%	38%
Slovenia	0%	10%	25%	25%	26%	26%
Ukraine	0%	0%	9%	9%	13%	13%

### Middle East and North Africa

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Algeria	30%	10%	35%	16%	47%	28%
Bahrain	0%	0%	100%	100%	100%	100%
Egypt	0%	7%	6%	17%	10%	25%
Iraq	0%	0%	0%	0%	0%	0%
Israel & Palestine	12%	0%	21%	8%	21%	28%
Jordan	0%	34%	43%	36%	50%	63%
Kuwait	0%	61%	100%	100%	100%	100%
Lebanon	0%	0%	11%	11%	10%	10%
Morocco	21%	15%	29%	23%	37%	32%
Oman	29%	24%	39%	48%	42%	56%
Qatar	0%	70%	40%	100%	100%	100%
Saudi Arabia	24%	11%	26%	34%	50%	43%
Tunisia	0%	0%	18%	0%	33%	16%
Turkey	2%	8%	10%	11%	11%	17%
UAE	3%	31%	38%	47%	63%	79%
Yemen AR	0%	0%	0%	0%	0%	0%

## Sub-Saharan Africa

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Burkina Faso	0%	0%	11%	0%	13%	0%
Cameroon	27%	0%	28%	9%	30%	8%
Central African Rep	2%	0%	5%	0%	17%	0%
Chad	7%	0%	22%	0%	9%	0%
DR Congo	0%	0%	0%	0%	0%	0%
Côte d'Ivoire	23%	7%	36%	13%	38%	15%
Ethiopia	0%	0%	0%	0%	0%	0%
Gabon	41%	0%	47%	0%	53%	0%
Ghana	25%	0%	26%	0%	28%	6%
Guinea	3%	0%	18%	0%	21%	0%
Guinea-Bissau	0%	0%	14%	0%	17%	0%
Kenya	0%	0%	6%	0%	14%	2%
Lesotho	0%	0%	0%	0%	0%	0%
Mali	1%	0%	1%	0%	2%	0%
Mauritius	0%	15%	0%	15%	16%	16%
Mozambique	3%	0%	12%	0%	21%	0%
Namibia	0%	4%	0%	7%	0%	10%
Niger	4%	0%	8%	0%	8%	0%
Nigeria	0%	0%	0%	0%	5%	1%
Senegal	37%	0%	40%	0%	39%	6%
South Africa	2%	0%	4%	2%	10%	4%
Sudan	6%	0%	8%	0%	8%	0%
Tanzania	0%	0%	0%	0%	0%	0%
Uganda	2%	0%	5%	3%	11%	4%
Zambia	0%	0%	4%	0%	5%	0%

## South East and East Asia and Oceania

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Australia	37%	12%	45%	28%	50%	36%
Cambodia	1%	0%	1%	1%	5%	3%
China	13%	14%	15%	15%	22%	25%
Hong Kong	67%	0%	91%	26%	90%	30%
Indonesia	5%	0%	8%	1%	13%	1%
Japan	0%	0%	5%	13%	8%	16%
Macao	100%	0%	100%	0%	100%	100%
Malaysia	57%	0%	80%	33%	80%	44%
New Zealand	2%	9%	4%	11%	4%	13%
Philippines	13%	2%	20%	7%	30%	13%
Singapore	28%	0%	31%	8%	33%	10%
South Korea	0%	3%	0%	16%	10%	24%
Taiwan	13%	1%	30%	22%	35%	32%
Thailand	3%	0%	64%	22%	65%	36%
Vanuatu	15%	0%	20%	0%	33%	0%
Vietnam	2%	0%	8%	0%	12%	5%

## South and Central Asia

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Bangladesh	0%	0%	0%	0%	0%	0%
India	1%	1%	3%	1%	5%	2%
Iran	0%	0%	0%	0%	0%	0%
Kazakhstan	2%	0%	3%	0%	6%	3%
Maldives	32%	0%	50%	0%	50%	0%
Mongolia	0%	0%	0%	0%	0%	0%
Nepal	0%	0%	3%	0%	8%	0%
Pakistan	0%	0%	0%	0%	0%	2%
Sri Lanka	0%	0%	1%	0%	5%	0%
Uzbekistan	2%	0%	3%	0%	6%	3%

## The Americas

	PSP in 2010		PSP by 2015		PSP by 2025	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
Argentina	10%	5%	19%	16%	26%	22%
Belize	33%	33%	33%	33%	50%	50%
Bolivia	0%	0%	0%	0%	0%	0%
Brazil	28%	19%	36%	24%	52%	46%
Canada	3%	6%	7%	9%	13%	13%
Chile	96%	94%	98%	98%	98%	98%
Colombia	20%	9%	31%	16%	34%	20%
Cuba	13%	0%	13%	0%	15%	4%
Dominican Republic	13%	0%	13%	0%	13%	8%
Ecuador	18%	15%	38%	38%	43%	40%
Honduras	7%	7%	8%	8%	10%	10%
Mexico	13%	22%	22%	30%	24%	32%
Panama	11%	0%	53%	53%	56%	56%
Paraguay	0%	0%	4%	0%	6%	3%
Peru	3%	10%	16%	13%	29%	35%
Trinidad & Tobago	0%	0%	0%	0%	79%	79%
Uruguay	3%	3%	9%	6%	14%	14%
USA	15%	7%	20%	9%	23%	14%
Venezuela	7%	0%	13%	6%	14%	11%

## People served by private water or sewerage services in 2010 and forecast for service in 2015 and 2025

Million people	2010		2015		2025	
Western Europe	181.8	45%	219.7	54%	227.4	55%
C&E Europe	36.0	11%	68.2	21%	86.0	29%
ME & Africa	68.2	5%	123.1	9%	217.8	13%
South & Central Asia	21.1	1%	43.1	2%	97.4	5%
South East Asia	328.2	16%	463.3	21%	646.2	28%
Oceania	9.5	28%	15.7	42%	12.8	31%
North America	99.3	22%	134.8	28%	209.5	40%
Latin America	100.1	21%	132.0	26%	178.0	33%
<b>World total</b>	<b>844.5</b>	<b>12%</b>	<b>1,201.8</b>	<b>16%</b>	<b>1675.1</b>	<b>21%</b>

## MERGERS AND ACQUISITIONS

Mergers and acquisition activity in the sector has been remarkably intense over the past decade, reflecting how ownership changes as strategies and perspectives change. 110 corporate transactions have been listed here, which have taken place since 1997. These transactions are primarily in the water sector and involved at least USD10million being paid for their stakes. In addition, more bids are in the offing, especially in Chile, the Philippines and perhaps in the UK. A considerable number of smaller transactions (typically 20-40 per annum) have also been recorded, especially in the US, where regulated utilities 'tuck in' privately-owned small water systems near to their own systems, in order to expand their customer base and benefit from economies of scale. These major transactions can be divided into four areas:

1. Acquisitions of listed companies
2. Acquisitions of municipal stakes
3. Acquisitions of private companies and divisions
4. Acquisitions of strategic stakes

Where appropriate, an implied value has been derived for the company by dividing the actual price paid by the size of the share stake acquired. Disclosure of earnings and asset earnings is somewhat inconsistent and incomplete, so two measures have been used here: the price paid per person (implied value divided by the number of people served either by water or sewerage services), and price/turnover (implied value divided by revenues) to outline the varying valuations for these assets and activities.

### Private equity deals, 2001–10

This list covers all 22 major deals where a company has either been acquired by a private equity house or sold from one such institution to another.

Company	Holding	Date	Stake	Price
West LB	Mid Kent	03/2001	100.0%	GBP106.0m
Glas Cymru	Dwr Cymru	05/2001	100.0%	GBP1,850.0m [3]
South Downs	Portsmouth	10/2001	100.0%	GBP71.0m
RBS	Southern Water	04/2002	100.0%	GBP1,050.0m
Macquarie	South East	09/2003	100.0%	GBP426.0m [3]
Consortio Financiero	ESVAL [1]	10/2003	49.8%	USD92.3 m
Penta Finance	SmVaK (AWG)	11/2003	54.3%	EUR54.5m
Penta Finance	SmVaK (Ondeo)	04/2004	44.1%	EUR46.5m
Arcapita Bank	South Staffs	11/2004	100.0%	GBP143.0m
PAI	SAUR	02/2005	85.0%	EUR1,037.0m
Hastings	Swan Group	02/2005	100.0%	AUD210.0 m
AIG	Utilities Inc	05/2005	100.0%	N/A
Terra Firma (UK)	East Surrey	10/2005	100.0%	GBP435.0m
Deutsche Bank	East Surrey [2]	12/2005	100.0%	GBP189.0 m
Macquarie	Aquarion	02/2006	100.0%	USD860.0m [3]
Aqualia	SmVak	04/2006	98.4%	EUR167.0m
Westpac	South East	01/2006	100.0%	GBP665.0m [3]
Osprey	AWG	10/2006	100.0%	GBP2,200m
Macquarie	Thames Water	10/2006	100.0%	GBP8,000.0m [3]
CIF / JP Morgan [4]	Southern Water	10/2007	100.0%	GBP4,195.0m
Alinda IF [5]	South Staffs	10/2007	100.0%	GBP400.0m
Saltire Water [6]	Kelda	02/2008	100.0%	GBP3,036.0m

Notes:

[1] 44.8% acquired by Consortio Financiero and 5.0% by the Moneda Chile Fund

[2] The original acquisition of East Surrey Holdings plc included the assets of Phoenix Gas, which have been retained by Terra Firma

[3] Cash and assumed debt

[4] JP Morgan Asset Management Infrastructure 32%, CIF 27%, UBS 18%

[5] An unconfirmed figure quoted in the financial press

[6] CII 47%, GIC Infra Holdings 33% & Infracapital 20%

### Bids for listed companies

The highest prices paid are for asset-owning companies in the US and the UK. In the former, the level of activity has been intense, with a significant proportion of the regulated customer base having seen its owners change hands twice during this period. The lower prices for SmVaK and ScVK reflect their being non-asset owning companies in the Czech Republic.

### Acquisitions, by bidding and target company, 1998–2010, (USDmillion)

Year	Bidder	Target	Bid price (USDmillion)	Stake bought	USD per person	Price / turnover
1998	Azurix	Wessex Water	2,500	100%	702	5.9
1998	Aqua America	Consumers	463	100%	691	4.7
1998	California WS	Dominguez	64	100%	427	2.6
1999	AWG	SmVaK	48	53%	60	2.8
1999	Union Fenosa	Cambridge	87	100%	300	2.9
1999	Anglian	Hartlepool	30	100%	333	3.0
1999	Kelda	York Waterworks	45	100%	265	3.2
1999	Thames	E'Town	923	100%	1,420	6.3
1999	Kelda	Aquarion	444	100%	888	3.8
1999	American WW	SJW Corp	390	100%	398	3.7
1999	American WW	NEI	700	100%	412	3.9
1999	Veolia	ScVK	27	38%	37	1.9
1999	Suez	United Water	927	67%	553	3.9
2000	RWE	Thames	6,750	100%	356	4.1
2000	American States	CCWC	31	100%	775	N/A
2000	American WW	Citizens Utilities	49	100%	445	0.5
2000	American WW	UWR	835	100%	835	N/A
2001	TMWA	Sierra Pacific	350	100%	1,400	N/A
2001	RWE	American WW	4,600	100%	341	3.2
2002	BOC	EMC	50	100%	N/A	1.2
2004	Arcapita	South Staffs	245	100%	199	2.4
2006	Agbar	Bristol Water	281	100%	264	2.2
2006	Linde	EMC	20	100%	N/A	0.3
2007	OTPP	ESVAL	365	49%	746	4.3
2007	OTPP	ESSBIO	340	51%	669	4.6
2007	Veolia	RUAS	42	100%	323	1.1
2009	AWW	EMC	18	100%	N/A	0.2
2008	Aguas Andinas	ESSAL	269	54%	384	N/A
2010	Suez Env	Agbar	4,500	100%	102	1.7
2010	SembCorp	Cascal	206	100%	44	1.1

The two bids for Thames are for somewhat different entities. The EUR11.3billion bid in 2000 included GBP4.3billion bid for the company's listed shares, while the GBP8.0billion bid in 2006 includes Macquarie paying GBP250million for 11% of Thames' equity, valuing Thames' equity at GBP2,275million, with the rest being accounted for by debt. RWE believes that it has made a EUR500million profit in this sale.

### Equity stakes in municipal/state entities acquired by listed companies

This list is by no means comprehensive, but it highlights that USD7.4billion has been spent by the private sector in acquiring equity stakes from governments and municipalities in the past nine years. Including other transactions where data was inadequate for inclusion, the real figure is likely to be in the range of USD9.0–10.5billion. Assets are not actually being bought in these cases, but instead either the equity of an operating company to manage the underlying assets or a minority stake in the



asset owning company is being bought. The high price/turnover ratios seen, especially in Chile, reflect the potential for revenue growth through extending water and sewerage services and, even more dramatically, sewage treatment.

**Completed acquisitions of stakes in municipal/state entities, by bidding company and target, 1997–2010 (USDmillion)**

Year	Bidder	Target	Bid price (USDmillion)	Stake bought	USD per person	Price / turnover
1997	Veolia	Budapest Sewerage	79	25%	158	5.4
1997	Suez	Budapest Water	82	25%	164	5.5
1998	Veolia	Sanepar	217	30%	100	2.6
1999	Bouygues/Azurix	OSM	133	80%	88	3.0
1999	Azurix	BA Province (C & A)	439	90%	244	12.2
1999	Dragados	A del Grande B A	44	31%	39	N/A
1999	EMOS	Aguas Cordeillara	193	100%	345	N/A
1999	Suez	EMOS	957	42%	226	14.2
1999	Suez	EMOS	178	9%	196	12.4
1999	Iberdrola	ESSAL	94	51%	312	10.8
1999	Thames & EDP	ESSEL	113	45%	251	13.2
1999	Suez	EMOS	957	42%	230	14.3
1999	AWG / Enersis	ESVAL	138	40%	136	5.1
1999	Gelsenwasser	Hanse Wasser	355	75%	676	N/A
1999	Vivendi / RWE	BWB	1,749	50%	448	3.1
1999	Azurix	G M de Desarrollo	39	80%	64	2.2
1999	Thames	Izmit Su As	21	12%	146	N/A
2000	Suez	Manuas Saneamento	111	90%	51	3.1
2000	Thames	ESSEL	73	26%	281	14.8
2001	EVN	Nosiwag	83	100%	184	5.5
2001	Thames	ESSBIO	336	51%	220	14.4
2001	AWG / VE	PVK	160	66%	101	2.4
2001	IW / UU	Tallinna Vesi	78	50%	186	N/A
2004	Falabella	ESSAT	74	100%	90	2.1
2004	Falabella	ESSAR	61	100%	55	2.0
2004	Falabella	ESMAG	35	100%	117	3.2
2004	Veolia	BVAG	450	75%	1,200	1.8
2006	DM Consunji	Maynilad Water	503	84%	N/A	N/A
2007	Acegas	APGA	N/A	100%	N/A	N/A
2008	Cascal	Zhumadian Water Co	18	51%	N/A	6.0
2008	Cascal	Yancheng Water Co	29	49%	100	6.1

Source: Envisager M&A Database

**Acquisitions of stakes in subsidiaries of listed companies and unlisted companies**

Examples here include the buying out of joint venture stakes (AAET, International Water, Cascal and China Water), along with buying out minority partners (SAUR), the outright acquisition of water assets held by a third party (Cambridge, Wessex, American WW and AquaSource), the acquisition of privately-owned companies (Utilities Inc, GH Holdings and Citizens Utilities) and non-core divisions from other water companies (Crea and Berlinwasser International).

**Completed acquisitions of stakes in subsidiaries, by bidding and target company, (USDmillion)**

Year	Bidder	Target	Bid price (USDmillion)	Stake bought	USD per person	Price / revenues
1999	American WW	AAET	32	50%	67	1.7
1999	Edison	Intl. Water	40	50%	70	N/A
2000	Bouygues	Crea	60	71%	30	1.7
2000	Nuon	Biwater Capital	130	50%	64	N/A
2000	RWE	China Water Co	70	49%	40	N/A
2000	AWG	Aguas Puerto	131	29%	179	6.7
2000	Guangdong Inv	GH Holdings	508	81%	123	1.9
2000	Bouygues	SAUR	158	13%	101	0.7
2001	Nuon	Utilities Inc.	405	100%	476	6.3
2001	Bouygues	SAUR	181	14%	108	0.7
2001	American WW	Citizens Utilities [1]	231	100%	330	N/A
2001	American WW	Azurix NA	160	100%	80	N/A
2002	YTL	Wessex Water	2,150	100%	581	N/A
2002	Kelda	AWW New Eng	120	100%	678	N/A
2002	RWE	Citizens Utilities [1]	859	100%	781	N/A
2003	Sime Darby	China Water Co	70	46%	43	N/A
2004	CKI	Cambridge	87	100%	301	3.4
2004	Aqua America	Heater Utilities	48	100%	320	N/A
2004	Aqua America	AquaSource	191	100%	382	N/A
2005	Westpac	Mid Kent Water	480	100%	820	5.6
2005	Amga	Aqua Italia	68	63%	348	2.2
2006	FCC	SmVaK	350	100%	315	4.4
2006	Westpac	South East Water	1,330	100%	885	5.9
2007	Aqua America	Utilities & Industries	51	100%	378	N/A
2007	Aqua America	Aquarion NY	7	100%	652	N/A
2007	Macquarie	Aquarion	760	100%	1,150	3.7
2007	OTPP	ASNSM	N/A	100%	N/A	N/A

Note: [1] Separate parts of the same company

Source: Envisager M&A Database

**Examples of strategic stake acquisitions in listed companies**

Information on these activities is particularly poor, as companies are not always inclined to publicise such deals. These exceptions give an indication of the scope of activities that take place, usually referring to building up stakes in a company which has been already invested in (Aguas Andinas), a strategic relationship (Intan Utilities), a prelude to a bid (Acque Potabili) or a stake divestment by a previous owner to a third party (Northumbrian).

**Completed acquisitions of strategic stakeholdings, by bidding and target company, (USDmillion)**

Year	Bidder	Target	Bid price (USDmillion)	Stake bought	USD per person	Price / turnover
1999	ACEA	Acque Potabili	10	11%	123	2.3
1998	Veolia	Intan Utilities	12	18%	111	3.0
2002	Agbar	Aguas Andinas	210	9%	229	16.5
2004	Agbar	Aguas Andinas	167	15%	109	3.2
2005	Ontario Teachers	Northumbrian	460	25%	236	2.8
2006	RBS	Southern Water	N/A	25%	N/A	N/A

Source: Envisager M&A Database

Looking back, eight companies have changed hands twice during this period and three have been bought and sold three times, ranging from Thames Water and American Water Works at one extreme, to Cambridge and Mid Kent at the other. This is likely to be a unique era of corporate activity for the sector.

### LOCAL COMPANIES – A SUBTLE SIDE OF PPP

Information continues to emerge about smaller and lower profile companies which continue to merit keeping at least a watching brief on them. Their very nature (unlisted, usually privately held and locally based) means that information about them can be patchy and at times inconsistent. This is highlighted by the somewhat volatile nature of some companies reported as active in the Russian Federation.

To merit inclusion in the following list, companies need to have gained at least one water or sewerage contract since 1987 which is still active and serves at least 10,000 people.

The last few years have been marked by the increase in the quality of local companies as well as their quantity. This reflects a shift away from opportunists (water vendors who provide a debatable quality of service based on exploiting deficiencies in the utility's service) to enablers, companies often working with the utilities to expand and improve services both in currently served areas and where no formal service previously existed.

In previous editions, we have noted some smaller, local players. This is an attempt to list local companies which have gained formal PPP contracts. The initial survey identified 97 companies in 17 countries. This excludes companies with joint ventures with the major international companies (e.g. the Eurasian Water Partnership in the Russian Federation, which is a Veolia joint venture). In this edition, 112 companies in 22 countries have been identified (some of those initially identified have been taken over or have left the sector). Further details about companies (population served and so on) will be included in the country entries.

PMWYB	Company Entry				Secondary List				Both			
	N	Water	WW	Both	N	Water	WW	Both	N	Water	WW	Both
1985-89	16	48.0	53.8	48.0	0	0.0	0.0	0.0	16	48.0	53.8	48.0
1990-94	39	34.6	16.9	45.1	13	0.4	2.9	3.3	52	35.0	19.8	48.4
1995-99	161	149.3	66.3	159.6	41	9.4	5.4	9.8	202	158.7	71.7	169.4
2000-04	293	132.0	98.3	189.0	73	11.1	7.1	15.5	366	143.1	105.4	204.5
2005-09	396	128.1	119.6	219.5	64	17.0	12.0	24.9	460	145.1	131.6	244.4
2010	22	18.8	15.7	34.5	2	0.7	0.3	1.0	24	19.5	16.0	35.5
<b>Total</b>	<b>927</b>	<b>510.8</b>	<b>370.6</b>	<b>695.7</b>	<b>193</b>	<b>38.6</b>	<b>27.7</b>	<b>54.5</b>	<b>1120</b>	<b>549.4</b>	<b>398.3</b>	<b>750.2</b>

The number of companies here operating internationally is small. One was identified operating in China (North American Envirotech), Vitens (the Netherlands) in Ghana, Aguas de Portugal (Portugal) in Brazil and Mozambique and NTR (Denmark) in the Maldives. Vitens and Aguas de Portugal are public companies, but these activities were gained as PPP projects on competitive tenders.

The impact of these companies ought to be put into their global context. The 927 contracts covered in the Envisager database that relate to companies with full entries in the Yearbook cover 695.7million people with an average of 750,000 people per contract, compared with 54.5million people covered by the 193 contracts held by these companies (it was 32.0million in 2008), with an average of 282,000 people per contract. 93% of people served by PSP contract awards identified here have been by the 164 companies with entries in the Yearbook, with 7% served by the other 112 companies listed below.

These numbers are somewhat distorted, since they do not include the 159million people served by incumbent companies, those already offering private sector provision prior to 1987. 157million of

these people are served by companies with a company entry and the other 2million are included in the list below.

### Smaller company list

<b>Project Country</b>	<b>Company</b>	<b>Parent Country</b>
Argentina	Benito Roggio e Hijos	Argentina
Argentina	Conteras Hermanos / Esuco	Argentina
Argentina	Phoenix / Sagua Intl / Simali	Argentina
Argentina	Sagua International	Argentina
Argentina	Sudamerica de Aguas	Argentina
Brazil	Aguas de Portugal	Portugal
Brazil	Aguas de Santo Antonio	Brazil
Brazil	Aguas de Tucurui	Brazil
Brazil	Aguia Branca	Brazil
Brazil	Carioca Christiani-Nielsen	Brazil
Brazil	Construtora Gautama	Brazil
Brazil	Construtora Nascimento	Brazil
Brazil	Emissao Engenharia	Brazil
Brazil	Emp Sul-Americana de Montagem	Brazil
Brazil	Empresa de Saneamento de Nobres	Brazil
Brazil	Foz do Brasil	Brazil
Brazil	Global Engenharia	Brazil
Brazil	Globalbank Consulting	Brazil
Brazil	Hidrogesp	Brazil
Brazil	Materia Perfuracao de Pocos	Brazil
Brazil	Matonense de Saneamento	Brazil
Brazil	Novacon	Brazil
Brazil	Obrecht Engenharia Ambiental	Brazil
Brazil	Perenge Engenharia	Brazil
Brazil	Primavera do Leste	Brazil
Brazil	Telar	Brazil
Brazil	Villa Nova Engenharia	Brazil
Chile	Grupo Hurtado	Chile
Chile	Hidroscan	Chile
Chile	Vicuna	Chile
China	Beijing BCEG	China
China	Chongqing Kanda Env	China
China	CNA Group	China
China	Dalian Dongda Env Eng	China
China	DKLS Industries Bhd	China
China	Hainan Runda Ind	China
China	Guangxi Huahong Water Affairs	China
China	Haerbin Wanxinglong Co	China
China	Huaqi	China
China	Hong Yuan Ju	China
China	Jiangsu Taizhou Water	China
China	Jinan Shifangyantong	China
China	Lianheruitong Water	China
China	Long Quan Group	China
China	North American Envirotech	Canada
China	Qingdao Huaou	China
China	R&F Properties Group	China

<b>Project Country</b>	<b>Company</b>	<b>Parent Country</b>
China	Rong Group	China
China	Shanghai Fudalefumen	China
China	Shanghai Qingyue Inv	China
China	Sino-Dutch Water Investment Co	Netherlands
China	United Envirotech	China
China	Xucheng Industrial Dev	China
China	Wai Kee Holdings	China
China	Weihai Dean Water Eng	China
China	Yiqi Group	China
China	Zhongchuang Water	China
China	Zhongxing Telecom	China
Colombia	Acuasasa	Colombia
Colombia	Acueductos y Alcantarillados Sostensibles	Colombia
Colombia	Aguas de la Costa	Colombia
Colombia	Aguas de la Guajira	Colombia
Colombia	Aguas de la Mojana	Colombia
Colombia	Aguas de la Ribera	Colombia
Colombia	Aguas del Llano	Colombia
Colombia	Aguas Kpital	Colombia
Colombia	Aguascol	Colombia
Colombia	Conhydra	Colombia
Colombia	Consorcio Almafama	Colombia
Colombia	Construcciones Insaca	Colombia
Colombia	Consultores de Desarrollo / Hidrotec	Colombia
Colombia	Emas / Ingenieria Sala	Colombia
Colombia	Empresa de Aguas de Giradot	Colombia
Colombia	Francisco Velasquez Inginiaria	Colombia
Colombia	Grupo Colombo-Cubano	Colombia
Colombia	Grupo Empresarial Energic	Colombia
Colombia	Grupo Hydros	Colombia
Colombia	Ingenieria Sala	Colombia
Colombia	Ingenieria Total	Colombia
Colombia	Operadores de Servicios	Colombia
Colombia	Presea	Colombia
Colombia	SIE de Colombia	Colombia
Colombia	Unisaguas	Colombia
Ecuador	Leonardo Armijos Luna	Ecuador
France	Alteau	France
France	Sogedo	France
France	STURNO	France
France	Ternois Epuration	France
Georgia	Multiplex Solutions	Switzerland
Ghana	Vitens	Netherlands
Indonesia	PT Buana & PT Dewata Arta Kharsima	Indonesia
Kenya	Gauff Ingenieure	Germany
Maldives	NTR / HOH	Denmark
Malaysia	George Kent Holdings	China
Mexico	Atlatec	Mexico
Mexico	Bufete	Mexico
Mexico	Coplata	Mexico
Mexico	Grupo Protexa	Mexico

<b>Project Country</b>	<b>Company</b>	<b>Parent Country</b>
Mexico	Solaqua / TCS Enterprises	Mexico
Mexico	Wheelabrator / Coplata	USA
Mozambique	Aguas de Portugal / Mazi Mozambique	Portugal
Philippines	Calapan	Philippines
Philippines	Pamatong	Philippines
Poland	Aquarius	Poland
Russia	Rosvodokanal (Alfa Group)	Russia
Russia	Eurasian Water Partnership	Russia
Russia	Russian Utility Systems	Russia
Russia	Syzranvodokanal	Russia
South Africa	Amanz' aBantu Services / Uzinzo	South Africa
Thailand	EGCO	Thailand
Uruguay	STA / Benencio	Uruguay
Venezuela	SNC Lavalin	Canada

## **PART 2: COUNTRY ANALYSIS**

**ARGENTINA**

<b>Economics (2008)</b>	
GNI per capita	USD7,190
GNI per capita (PPP)	USD14,000
GDP in Agriculture	9%
GDP in Industry	35%
GDP in Services	56%

**Regulation and management**

Communities with a population of more than 15,000 are covered by the Programa Nacional de Optimización, Rehabilitación y Ampliación de Servicios de Agua Potable y Alcantarillado Cloacal (PRONAPAC). This programme seeks to provide universal water provision and sewerage services on a financially self-supporting basis through the encouragement of private sector participation and is being supported by the World Bank. The Programme for Drinking Water and Sanitation (Préstamo BID 857-OC/AR) covers communities with a population of 500-15,000. It seeks to develop a suitable level of service to be provided by the municipalities. For smaller communities, the Basic Drinking Water and Sanitation Programme (PASPAYs) is concentrating on public health concerns.

<b>Population</b>	
2008 (million)	38.4
2020 (million)	44.5
Urbanisation in 2008	91.8%
Urbanisation by 2020	93.8%
Urbanisation by 2050	96.0%

<b>Urban Data (2008)</b>	
With improved drinking water	98%
With household drinking water	83%
With improved sewerage	91%
With household sewerage	N/A
With 2 <sup>o</sup> sewage treatment	10%

**Private sector participation**

Until 2002, PSP was at the heart of the government's plans for universal water and sewerage coverage in urban areas. In 2004, some 16.2million of the people living in urban areas of Argentina (33million people) were served by the private sector, excluding the cancelled Tucuman concession (0.8million people). Since then, this picture has changed.

**Development of water and sewerage, 1980-2001**

<b>Census year</b>	<b>Water</b>	<b>Sewerage</b>
1980	60.9%	34.0%
1991	68.3%	33.9%
2001	78.4%	42.5%

In Argentina PSP was supported by the World Bank and IMF reforms and a pro PSP policy under Carlos Menem. Argentina underwent a financial crisis during the 1980s which meant that new investment was not possible and this in turn encouraged a PSP programme. The utility serving Buenos Aires was seen as performing poorly with 45% distribution losses (Zerah and Graham, 2001), excessive staffing and management hampered by political appointments and political intervention (Lindfield, 1998). The World Bank supported the development of a PSP commission and the Government set up ETOSS, a regulatory agency (Lindfield, 1998). During the same time, smaller concessions were developed and awarded to local companies such as Latin Aguas.

<b>Freshwater</b>	
Annual availability (2007)	276km <sup>3</sup>
Per capita (2008)	6,920m <sup>3</sup>



<b>Freshwater</b>	
Annual withdrawal (2007)	11%
Domestic (2007)	17%
Industrial (2007)	9%
Agriculture (2007)	74%

<b>Groundwater</b>	
Annual availability (1998)	128.0km <sup>3</sup>
Per capita	3,543m <sup>3</sup>
Annual withdrawal (1975)	4.7km <sup>3</sup>
Domestic (1987)	11%
Industrial (1987)	9%
Agriculture (1987)	72%

### **A shift from international to regional players**

Since 2000, South Water of Argentina bought out the Azurix stakes in the SAUR led consortia. Another local company, Latin Aguas has become a major regional player, operating three concessions in northern Argentina.

The World Bank's International Centre for Settlement of Investment Disputes (ICSID) ruled in July 2006 that the Argentine authorities are to pay USD165million compensation to Azurix (now Enron) for the cancellation of the Buenos Aires contract in 2002. This is 29% of the USD565million Azurix claimed for the USD438million concession fee paid in 1999 and capital works carried out.

### **Veolia and Tucuman – Political change and contract change**

Generale des Eaux (now Veolia) was awarded the Companhia de Aguas del Aconquija (CAA) concession for water and sewerage services to the city of Tucuman in 1995. The contract was awarded by the Province's governor, a Peronist. During the first two years of the contract, CAA repaired facilities at 400 sites, boosting potable water treatment capacity by 15%. In early 1996, a new governor was elected, who adopted an anti-PSP approach. When Veolia sought to have the concession's tariffs raised to cover investment work, the governor encouraged residents not to pay their bills and sought to have the concession rescinded. In December 1996, under the aegis of the ICSID and central government an agreement was reached and signed in April 1997. This was subsequently modified by the Province on a unilateral basis. In consequence, Veolia cancelled the contract in October 1998, at a loss of FF190million (USD44.7million). Veolia filed a USD100million suit against the government and the ICSID arbitration panel has examined the case.

### **Buenos Aires – The 'British Invasion' backfired**

In June 1999, Azurix (the water services subsidiary of Enron, USA) paid USD438.6million for a 90% holding in the concession company for two of the three regions of the Province of Buenos Aires. The British Management (from Azurix's Wessex Water subsidiary) arrived on the anniversary of Britain winning the Falklands War and the local media referred to this as the 'British Invasion'. During 2000, there were problems with contaminated water in Bahia Blanca. Azurix Buenos Aires agreed with the provincial regulatory agency not to bill residential customers for water services for a 50 day period during which the taste and odour of supplied water were allegedly unsatisfactory. These problems cost the company USD5.4million in revenues and additional costs. In March 2001, the dispute was apparently settled, with Azurix accelerating USD30million in spending to eliminate the problem. In October 2001, Azurix announced that it was withdrawing from the concession due to continuing problems with the provincial government. In February 2002, Azurix cancelled its contract with the Buenos Aires province, handing over the concession to the operational company.

### **Aguas Argentinas – Foreign currency debt versus local currency tariffs**

Suez and Aguas de Barcelona's consortium won the bidding for the central Buenos Aires concession in April 1993 with a bid 27% below the previous municipal tariff. The AA consortium took over a network with 45% distribution losses, providing water to 70% and sewerage for 58% of the city's 9million inhabitants. Suez gained a majority holding of the concession in November 1998 when

Sociedad Comercial Del Plata (SCP) sold its 10.8% stake to Suez and Agbar. In 1993, total investment for the first five years was intended to be USD1,200million. By the end of 1999, USD750million had been invested in AA's infrastructure. In 2001 Aguas Argentinas extended potable water and sewerage coverage in low-income areas as part of the company's USD190million investment during the year. Potable water access has already been connected to 22,000 residents.

The Aguas Argentinas contract was based on performance targets (connections, levels of service, metering) rather than capital spending. A price formula was drawn up, which would be reviewed every five years (Lindfield, 1998). But ETOSS was staffed by former OSN employees and therefore not formally qualified for their new roles. It has been suggested that the monitoring process was politically motivated (Zerah and Graham, 2001).

In 1994, a tariff rise of 13.4% was imposed because the infrastructure condition was found to be worse than expected. Since 1996, AA and ETOSS went into a series of contract renegotiations over bill collection and charging. By 2001, it appears that AA was experiencing financial problems and from 2001, ETOSS imposed a series of fines relating to AA's performance as the company reduced spending in the wake of the 2001 economic crisis and the 2002 Peso devaluation. Between 2003 and 2005, further renegotiations took place but were inconclusive and the contract was handed back in 2006 (Castro, 2006). Capital spending was being held back to retain the contract, as the economic crisis ruled out compensatory tariff increases as stipulated in the contract. In July 2004, an interim debt restructuring agreement was drawn up to create the basis for a normalisation of the contract in 2005. However, in September 2005, Suez announced that it would be exiting AA. Suez and Agbar sold their stakes in AA to the municipality in 2006.

In 2001-02, the economic crisis exposed the danger of having a major concession based upon foreign currency debt. The collapse in the value of the Peso against the Dollar and the Euro forced Suez and Agbar to make write downs against these contracts. Suez had EUR480million in hard currency debt in Argentina at the end of 2001, the great majority relating to water investments. The company recorded a EUR80million loss on currency translations in 2001, along with releasing EUR118million in provisions. A further write-down of EUR500million (net of minorities and tax) was made in June 2002. In July 2004, an interim debt restructuring agreement was drawn up to create the basis for a normalisation of the contract in 2005. Agbar made a write down of EUR55million for its water activities in Argentina in 2002. In December 2003 Agbar wrote off all direct and indirect investments in Argentina and constituted provisions of EUR216million to cover the maximum loss that the Argentine operations might cause in the future.

In 2010, the International Centre for Settlement of Investment Disputes ruled that the Argentinian government had acted unfairly over the Buenos Aires and Santa Fe concessions. While Suez Environnement is seeking USD1.2billion in compensation, the amount to be awarded will be restricted to the 2002-06 period and somewhat lower than this.

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Buenos Aires	12,550,000	13,067,000	Aguas Argentinas 1993-2006
Cordoba	1,423,000	1,552,000	Water and sewerage PSP 1997-2007
Rosario	1,186,000	1,280,000	Water provision BOT 1995-2006
Mendoza	876,000	956,000	Water provision BOT awarded in 1998
Tucumán	781,000	868,000	Water provision BOT 1997-98

### **Politics and the Peso Crisis**

The Aguas Argentinas, Aguas Provinciales de Santa Fe and Aguas Cordobesas concessions have all been particularly affected by the 2002 Peso Crisis. Meanwhile, the Aguas del Gran Buenos Aires concession was cancelled in July 2006. According to the provincial government, after six years of the concession, 71% of the people in AGBA's concession region lack sewer connections and 64% drinking water. The province's state water company Aguas Bonaerenses (ABSA) will now run the concession. SAUR renegotiated its Mendoza concession (the government currently holds 20% of the concession and in 2008 announced that it would like to acquire a further 20%) and the Catamarca concession may be revived. Proactiva's 30 year Catamarca concession was awarded in 2000 and rescinded in 2005.

<b>Private sector contracts awarded (Please see relevant company entry for details)</b>		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Misiones	30 year water and sewerage concession	Urbaser
Balcarce	20 year water and sewerage concession	Aguas de Balcarce / Camuzzi
Formosa	30 year water and sewerage concession	Aguas de Formosa
Santiago del Estero	30 year water and sewerage concession	Aguas de Santiago
Mendoza	95 year water provision BOT	Obras Sanitarias de Mendoza
Escobar	Water provision concession	Aguas de Valencia
Laprida	Concession, water and sewerage	Aguas de Laprida / Camuzzi
Rioja	Concession, water and sewerage	Aguas de La Rioja
Salta	Concession, water and sewerage	Aguas de Salta
Corrientes	Concession, water and sewerage	Aguas de Corrientes
Campana	Water concession	Aguas de Campana
Cordoba	30 year concession, water and sewerage	Aguas Cordobesas

### Problems endure

Buenos Aires' Aysa, was unable to satisfy demand at the beginning of 2008, due to insufficient service expansion investments. In essence the re-nationalised entity continues to face the problems experienced in 2006, when the Aguas Argentinas' contract ended. The status of Aguas de La Rioja is currently in question. It appears that many of the surviving concessions are currently under constant scrutiny from a number of interests.

In 2010, the IDB loaned Argentina USD710million for urban water and sanitation projects, with the first USD200million going to Salta and San Juan.

<b>Private sector company operations (Please see the relevant company entry for details)</b>				
<b>Company</b>	<b>Parent company/(country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Camuzzi	VE (France)	45,000	45,000	<b>45,000</b>
OS de Mendoza	SAUR (France) / South Water (Argentina)	1,200,000	950,000	<b>1,200,000</b>
Aguas de Formosa	South Water / Sagua (Argentina)	185,000	185,000	<b>200,000</b>
Aguas de Santiago	South Water / Sagua (Argentina)	235,000	235,000	<b>235,000</b>
AgVal	Aguas de Valencia (Spain)	150,000	0	<b>150,000</b>
Urbaser	Gruppo ACS (Spain)	300,000	300,000	<b>300,000</b>
Aguas de La Rioja	Latin Aguas (Argentina)	235,000	174,000	<b>235,000</b>
Aguas de Salta	Latin Aguas (Argentina)	1,047,000	769,000	<b>1,047,000</b>
Aguas de Tumbles	Latin Aguas (Argentina)	157,000	95,000	<b>157,000</b>
Aguas de Corrientes	Latin Aguas (Argentina)	634,000	473,000	<b>634,000</b>
Aguas de Campana	Esuco (Argentina)	78,000	0	<b>78,000</b>
Aguas Cordobesas	Gruppo Roggio (Argentina)	1,265,000	0	<b>1,265,000</b>

### Sources:

Castro J P (2006) *Water Services in Latin America: Public or Private? (Discussion of Four Case Studies)*. MSc Thesis, Erasmus University, Rotterdam

Lindfield M R (1998) *Institutions, Incentives and Risk Preparing Markets for Private Financing of Urban Infrastructure*. The Australian Housing and Urban Research Institute. Brisbane, Queensland University of Technology / Erasmus University Rotterdam

Zerah M H & Graham K (2001) *The Buenos Aires Concession: The Private Sector Serving the Poor. In Asia, WASP-S. (Ed.) New Delhi, WSP*

**AUSTRALIA**

<b>Economics (2008)</b>	
GNI per capita	USD40,240
GNI per capita (PPP)	USD37,250
GDP in Agriculture	3%
GDP in Industry	29%
GDP in Services	68%

**Water resources**

Australia has the lowest percentage of rainfall as run-off, the lowest amount of run-off, the least amount of water in rivers and the smallest area of permanent wetlands in the world. In addition, the country has the most variable rainfall and stream flow in the world, with inland waterways characterised by high turbidity (sediment loading) and salinity. The country is characterised by a dependence on groundwater resources and the over-development of its main river basins. As for renewable resources, 20% are fully utilised, and 15% of supplies come from groundwater resources.

In much of inland Australia, groundwater is often the only practical water supply for the pastoral and mining industries and their associated communities. The Great Artesian Basin is of critical importance over a large area of eastern Australia. In the Perth region, groundwater constitutes about two-thirds of total water use and about 30% of the water supplied by the Western Australian Water Corporation. Australia has the highest per capita water storage of all countries, because of the variable rainfall. Australia's storage capacity in major reservoirs totals some 81,000GL, or 3.7 times the developed resource. The bulk of water storage is concentrated in a few very large reservoirs. Australia's ten largest reservoirs hold about 50% of national capacity. In New South Wales, the ten largest reservoirs contain 90% of that State's storage volume. In 75% of lakes and reservoirs, chlorophyll levels are regarded as excessive. There is a clear link between the concentration of phosphorus in these waters and the amount of chlorophyll (or algae) present.

Australia's National Dryland Salinity Program estimates that over 20% of surface water resources in South Australia are too saline for human consumption. Lost water resources are valued at around AUD100million each in some local supply catchments. Other costs attributed to salinity are AUD130million per year in lost agricultural production and AUD100million pa in damage to infrastructure. A AUD300billion national water grid linking the wet northern regions of Australia with the dry south was unveiled by private sector groups in 2004. The idea would be to create a self-sufficient water management scheme for Australia that would be developed through optimising water resources and reuse while minimising losses. The water grid would have annual running costs of around AUD6billion.

**Water use**

Total water use of Australia's major cities remained static between 1991 and 1998 despite a 12% increase in the total number of properties supplied. If the effects of the drought in 1998 were accounted for, the overall water usage would have declined. User-pays pricing and demand management is delivering benefits in improving the efficiency of water use in urban communities. Unaccounted for water in Australian urban water networks is relatively low at 16% of total deliveries. Unaccounted for water includes unmetered supplies such as street flushing and fire fighting, together with leakage.

Water usage in an average household of 2.8 people ranges from 263,000L pa for Sydney to 700,000L pa for Darwin. Water is mainly used outdoors, with 30–55% spent mostly watering lawns and gardens. For example, water use in Darwin is about 700,000L pa for detached houses but 323,000L pa for flats without gardens.

Australia is wasting 92% of its city runoff water and 86% of its effluent water. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) believes that storm water, treated sewage effluent, treated industrial discharges and household laundry and bathroom wastewater, could be used for irrigation of city parks, verges, ovals and other horticultural uses, along with a number of industrial processes, for cooling water, and for toilet flushing. Between 1998 and 2002, the re-use of effluent has doubled to 14%, due to AUD300million (USD163million) investment around the country. Savings of AUD1-5 for every 10 kilolitres of water recycled are achievable.

<b>Population</b>	
2009 (million)	20.3
2020 (million)	23.3
Urbanisation in 2008	88.7%
Urbanisation by 2020	90.6%
Urbanisation by 2050	93.8%

### Management

A national strategic framework for water reform was agreed through the Council of Australian Governments in February 1994. This created a structured programme of reform measures to achieve more efficient and sustainable water resource use. State and territory governments have prime responsibility for water resource management and implementation of the reforms. The Federal Government has a complementary role in the reform process in providing leadership and facilitating implementation, in the interest of promoting national outcomes. The reforms were implemented over the period to 2001, covering both rural and urban areas and include measures in relation to water pricing, water entitlements and trading, environmental requirements, institutional reform, public consultation and education, and research. Good progress has been made in implementing the reforms in the short time since they were agreed.

In 2003, the Senate Environmental Committee announced the recommendation of the creation of a national policy. This would set targets for regulating and improving supplies, set efficiency standards, prepare management guidelines and coordinate monitoring and funding arrangements. Suitable pricing levels need to be set to encourage conservation. While Australia is the world's driest continent, the average price for domestic water is AUD1.64 per m<sup>3</sup> (USD0.93), materially below the level charged in Japan, the UK and most of northern Europe. Perth was expected to need additional sources of potable water by 2005, Brisbane and Melbourne by 2015 and Canberra by about 2017.

Water property rights systems are being addressed by the state governments under a framework of national principles. Transferable water entitlements are being developed so that they can be traded like any other commodity. In a system of transferable entitlements, water rights can also be bought or reserved to protect the environment. This market is discussed in some detail below. Most water agencies are adopting a full 'user pays' system, charging for water at close to its true supply cost, whereby all water consumed must be paid for. Environmental costs are based on a set of national principles on water for ecosystems and measures to promote integrated catchment management approaches. State governments have undertaken activities to promote water trading and initiated action to progress interstate water trading. Issues relating to groundwater management are also being examined through a national framework, as is management of stormwater and wastewater resources. Water quality is being addressed through the National Water Quality Management Strategy (NWQMS), which seeks to achieve a nationally consistent approach to water quality management, while allowing flexibility to respond to differing regional circumstances. The National River Health Program (NRHP) is developing the first national biological monitoring system for Australia's rivers, for the assessment of river health and related management action and State of the Environment reporting. Irrigation accounts for 70% of diverted river waters, with much of the remainder used for domestic consumption.

The AUD2billion National Water Initiative unveiled in 2006 seeks to secure water supplies up to 2032 through appropriate water pricing, ensuring that water entitlements are secure and tradable, along with interstate water trading and developing scientifically-based and transparent water planning, water resource accounting and the integrated management of water resources. The priority is to minimise losses and allocate existing water from the rural sector more efficiently through trading and improved price signalling rather than building dams or plant.

<b>Urban Data (2008)</b>	
With improved drinking water	100%
With household drinking water	N/A
With improved sewerage	100%
With household sewerage	100%
With 2 <sup>0</sup> sewage treatment	95%

## PSP plans

According to the Australian Council for Infrastructure Development in 2003, since 1993, more than USD1,100million of public-private partnership contracts have been signed in the water industry. PSP is being carried out on a state by state basis, with a wide range of approaches and attitudes. Major water and sewerage projects currently under consideration number 12 and have a combined capital expenditure of AUD2.7billion. In Victoria, the State is seeking to privatise its water services in the medium term, while the 2003 Constitution (Water Authorities Bill) and the Water Legislation Bill are currently being debated to see if the private sector ought to be excluded from asset ownership. Currently, water resources are managed by three separate entities. Melbourne Water, the wholesale company for the city of Melbourne is currently to stay in state hands, with O&M outsourcing contracts being developed. This state is seen as the leader in market development terms. South Australia is seeking a BOOT approach. The Labor Party seeks to demonstrate that assets are returned to public ownership after a given time. In this context, United Water's (UW) AUD1,500million 15 year BOOT for Adelaide is non-contentious, given that UW's contract calls for a 20% fall in operating costs. Canberra is expected to privatise its water provision services in the medium term. Western Australia is developing a partnership basis, since it seeks to avoid too much contracting out, so that the municipalities hold on to their intellectual knowledge. The State of Queensland has restricted PSP to one contract (Noosa) to date and Brisbane Water remains a council entity. In New South Wales, Sydney Water has been corporatised and bulk water provision is carried out by the private sector (see city study below). The AUD1,200million sewerage scheme is open to tender, and various bids have been received, including one from Sydney Water.

### The cost of asset extension and enhancement

The replacement value of Australia's municipal and industrial water supply systems are estimated at AUD44billion, with a further AUD37billion for sewerage. While the quality of this infrastructure has been seen as improving in recent years by the engineering profession, none is seen as in a good condition (an 'A' rating, with 'B' being fair, 'C' poor and 'D' very poor, 2010 is provisional):

### Condition of water infrastructure, 1999–2010

	1999	2001	2005	2010
Water	C-	C	B-	B-
Wastewater	D-	C-	C+	B-
Stormwater	N/A	D	C-	C-

Source: *Engineers Australia (2005) 2005 Australian Infrastructure Report Card, (2010) Infrastructure report cards 2010 & The Institution of Engineers, Australia (1999) A report card on the nation's infrastructure*

Spending on water and sewerage engineering and water storage systems such as dams is forecast to rise by 6.5% per annum in the long term:

### Annualised water and sewage engineering costs, 1996–2018 (AUDmillion)

1996-00	Actual	1,251
2000-04	Actual	1,692
2004-09	Actual	4,603
2010-14	Forecast	7,564
2015-18	Forecast	5,197

Source: *Construction Forecasting Council (www.cfc.acif.com.au), 2010 forecasts*

Freshwater	
Annual availability (2007)	492km <sup>3</sup>
Per capita (2008)	22,956m <sup>3</sup>
Annual withdrawal (2007)	5%
Domestic (2007)	15%
Industrial (2007)	10%
Agriculture (2007)	75%

### Companies noted

Along with Suez, Veolia and UU a number of local players have been identified. Actew, a publicly held utility and the private Australian Gaslight Company have formed a JV Actew AGL, Australia's first multi utility entity. Actew retains ownership of Australia Capital Territory's (ACT's) water and sewerage assets, with the JV being responsible for service provision. United Group acquired the Maffra contract from RWE in 2004 and seeks to develop its BOT activities.

Groundwater	
Annual withdrawal (1983)	2.0km <sup>3</sup>
Domestic (1983)	0%
Industrial (1983)	23%
Agriculture (1983)	77%

### The cost of taboos

In July 2006, a referendum rejected plans to recycle wastewater in Toowoomba. The AUD73million scheme was intended to pioneer the use of treated effluent as the town's main water supply. The town of 92,000 has no river and securing water supplies by conventional means is set to increase water costs by at least 50%.

### The cost of sustainability

In May 2008, the government announced that it would commit AUD12.9billion pledged to protect water supplies in the face of climate change under its 'Water for the Future' programme. This includes AUD1.5billion in new urban water investment to help secure water supplies for homes and businesses; AUD1.0billion for the National Urban Water and Desalination Plan, AUD250million for the National Water Security Plan for Cities and Towns, and AUD250million for the National Rainwater and Greywater Initiative. A further AUD5.8billion will be invested in a rural water programme (including AUD1billion for water resource and recycling initiatives serving towns with less than 50,000 people and AUD450million for developing national water accounts and monitoring programmes) and another AUD3.1billion will be set aside to purchase some 30% of the country's water rights to put back in the Murray Darling Basin waterways.

MAJOR CITIES			
City	2005	2015	Status
Sydney	4,331,000	4,701,000	Corporatised, private bulk water provision
Melbourne	3,626,000	3,933,000	SE Water O&M
Brisbane	1,758,000	1,946,000	PSP under consideration
Perth	1,474,000	1,627,000	PSP desalination contract
Adelaide	1,134,000	1,230,000	One water & sewerage PSP

### Sydney Water becomes State Water

In July 2004, Sydney Water was corporatised and renamed State Water. It will have an independent regulator and has been ordered to attain cost savings of AUD1.7billion (EUR966million) between 2004 and 2014. The entity has suffered from years of project delays, especially related to management problems. Sydney's Waterplan 21, the development blueprint for achieving sustainable water consumption by 2021 has been scaled back due to the abandoning of proposals for industrial water recycling, citing inadequate demand and funding cutbacks. The pipeline was to have taken effluent from upgraded treatment plants in the satellite cities of Liverpool and Glenfield. By 2010, the government had aimed to recycle 83million L, but this target is now expected to be lowered. Sydney Water is increasing spending on its pipe network by 35% to AUD38million (EUR23.16million) pa, along with pipe inspections costing a further AUD36million (EUR21.9million). Around 200 leaks a day spring from the 21,000km of secondary pipes linking mains to households, while the overall rate of leakage was 10.7% as of February 2004, or 188ml/day. About 7,000km of mains are inspected annually, with about 4,000km repaired each year, saving an estimated 38.8ml of water each day. By June 2005, this saving is expected to rise to 60ml.

Private sector contracts awarded (Please see relevant company entry for details)		
Location	Contract	Company

<b>Private sector contracts awarded</b> (Please see relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Noosa	Sewerage BOT	Australian Water Services
Sydney	Water treatment BOT	Australian Water Services
Brisbane	Sewage treatment DBO	AWG
Sydney	Water treatment BOT	North West Transfield
Melbourne	Water treatment BOT	North West Transfield
Melbourne	Water & wastewater services	Utility Services
Melbourne	Desalination	Australian Water Services
Adelaide	Rural water treatment BOO	International Water
Coliban	25 year water BOOT	General Water Australia
Noosa	Water provision BOT	General Water Australia
Sydney	Desalination DBO	General Water Australia
Sydney	Water treatment BOO	General Water Australia
NSW	20 year wastewater DBO	General Water Australia
Noosa	25 year wastewater DBO	Australian Water Services
Adelaide	Water and sewerage concession	United Water
Ballarat	Water treatment BOOT	United Water
Ballarat	Sewage treatment BOT	United Water
Victoria	Water provision to four towns	Aqua Tower
Sydney	Wastewater	VE
Queensland	Wastewater recovery DBO	VE
Queensland	Water DBO	VE
Townsville	Water provision	United Utilities Australia
Bustard Bay	10 20 year W & WW O&M	United Utilities Australia
N Queensland	20 year water DBO	United Utilities Australia
Waikerie	15 year wastewater DBO	United Utilities Australia
Berri Barmera	25 year water reuse DBO	United Utilities Australia
Adelaide	20 year BOT desalination	UUA / Acciona
Perth	Desalination	Australian Water Services
Pimpama	Wastewater treatment	Australian Water Services

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Australian WS	SE (France)	3,250,000	120,000	<b>3,370,000</b>
United Water	VE (France)	1,310,000	1,200,000	<b>1,310,000</b>
GW Australia	VE (France)	1,140,000	11,000	<b>1,151,000</b>
NW Transfield	Mitsubishi (Japan)	530,000	0	<b>530,000</b>
International Water	Mitsubishi (Japan)	189,000	0	<b>189,000</b>
UU Australia	Mitsubishi (Japan)	180,000	8,000	<b>188,000</b>
Utility Services	Leighton (Australia)	1,300,000	1,300,000	<b>1,300,000</b>
UUA / Acciona	Acciona (Spain) / Mitsubishi (Japan)	500,000	0	<b>500,000</b>
Aqua Tower	Cheung Kong Infra (Hong Kong)	25,000	0	<b>25,000</b>

### Water trading in the Murray River Basin

Water trading has been used to encourage the optimal use of water for agricultural purposes in Australia, especially in the Murray-Darling River Basin in Victoria. Permanent and spot rights are traded on an exchange; the former giving the bidder the right to use the water in perpetuity, the latter is used to meet seasonal shortfalls.

Permanent water trade by volume is considerably less in volume than temporary trade, but the price paid is higher, due to the nature of permanent water transfer and is much less affected by the seasonal allocations within authorities. These water licence values have risen from AUD180 per ml in 1994 to more than AUD2,000 per ml. In wet years with full dams, irrigators gain a 100% allocation and utilise all the water covered by the licence. But in dry years, governments can reduce allocations. Prices are related to seasonal supply and demand, which also varies from year to year. Likewise, price is affected by the availability of water rights on the market.



**Murray Irrigation Limited, spot prices, 1994-2010**

Season	Total value AUDmillion	Average AUD/ml	Low AUD/ml	High AUD/ml
1998-99	0.83	15.33	6	65
1999-00	2.24	37.68	21	85
2000-01	1.12	15.49	8	30
2001-02	2.85	40.82	20	75
2002-03	12.64	228.09	100	350
2003-04	5.71	70.13	50	150
2004-05	4.97	73.35	44	200
2005-06	4.21	44.59	34	140
2006-07	12.28	370.73	70	800
2007-08	7.85	680.04	200	1,100
2008-09	16.38	298.20	225	600
2009-10	9.06	148.24	63	500

**Murray Irrigation Limited, permanent entitlements, 1996-2010 (to 20<sup>th</sup> August 2010)**

Year	Entitlements	AUD per entitlement	
		Low	High
1996	1,168	213	300
1997	1,512	252	338
1998	1,816	270	450
1999	1,155	400	415
2000	1,679	280	420
2001	310	360	375
2002	2,914	190	450
2003	3,724	300	500
2004	1,717	407	550
2005	2,496	540	600
2006	6,499	550	800
2007	14,752	500	1,100
2008	22,890	525	2,100
2009	7,719	530	1,970
2010	1,827	100	1,514

The high and low prices here are for buy and sell quotes. Data is taken from the [www.murrayirrigation.com.au](http://www.murrayirrigation.com.au) site.

Murray Irrigation Limited regulates the provision of water to 2,400 farms in southern New South Wales. Water rights and permanent entitlements worth in the region of AUD80million have been traded over the past 12 years.

Nationally, in 2001-02, 92% of water rights trading were for temporary allocations, reflecting the need for specific water provision services at a given time, rather than for general allocation allowances.

Sources:

*Construction Forecasting Council (www.cfc.acif.com.au), September 2005 forecasts*

*Engineers Australia (2005) 2005 Australian Infrastructure Report Card*

*The Institution of Engineers, Australia (1999) A report card on the nation's infrastructure*

*Suez (2007) Suez Environment in Australia, Press Kit, April 18<sup>th</sup> 2007*

**BANGLADESH**

<b>Economics (2008)</b>	
GNI per capita	USD520
GNI per capita (PPP)	USD1,450
GDP in Agriculture	19%
GDP in Industry	29%
GDP in Services	52%

**Management**

Water policy is managed by the Ministry of Water Resources, with a National Water Council responsible for all inter-ministerial cooperation. The National Water Plan, started in 1983, concentrated on flood control and an integrated water management policy was developed in 1995, leading to a National Water Policy and National Water Management Plan being adopted in 1998. These took into account municipal water supply and sewerage issues for the first time. The Policy aims to change traditional service delivery and increase sector capacity by decentralization, user participation in planning, development, and operation and maintenance through local government and community-based organizations. The 2004 National Water Management Plan aims for 100% basic water supply and sanitation coverage in towns and rural areas by 2015. Government coverage targets for piped water supply in urban areas are 70% by 2010 and 90% by 2015, with 100% coverage to at least a basic minimum service level by 2010. Actual urban piped water access by 2008 was 24% (United Nations JMP 2010 figures).

<b>Population</b>	
2009 (million)	162.2
2020 (million)	181.2
Urbanisation in 2008	27.1%
Urbanisation by 2020	33.9%
Urbanisation by 2050	56.4%

**Water provision**

In 1998, 87% of people in Bangladesh were within 150m of a tube well and 97% of the population had what was seen as access to safe water for drinking. However, tube wells have their own problems. 22% of the 7million tube wells in use suffered from arsenic contamination, along with bacterial contamination in 22% of shallow and 9% of deep tube wells.

**Water utility performance, 2006-07 (11 leading cities surveyed)**

	<b>Dhaka</b>	<b>Chittagong</b>	<b>National average</b>
Water coverage (%)	83.3%	34.2%	55.4%
Water availability (hours / day)	23.0	8.0	11.7
Unaccounted for water (%)	37.2%	33.3%	22.5%
Non revenue water (%)	48.6%	33.3%	24.8%
Metered connections (%)	70%	86%	18%

Source: WSP (2009) *Bangladesh Water Utilities Data Book, 2006-07*

According to the World Bank 95% of Bangladesh's population has access to safe drinking water and almost half of the population has access to improved sanitation. The water data below is for urban household connections, which are appreciably less developed. However, Bangladesh cannot meet the Millennium Development Goal (MDG) target on sanitation if sanitation coverage is not raised by 9.5% a year. During the first half of the 1990s, sanitation coverage increased by 7.5% pa. It has slowed down in the past decade and indeed urban coverage fell from 55% to 51% between 2000 and 2004 due to rapid urbanisation. There was a fall in urban water coverage from 83% to 82% during this period for the same reason.

The World Bank noted in December 2005 that urban water requirements are set to rise from 10,000million L a day to over 35,000million L in the future.

<b>Urban Data (2008)</b>	
With improved drinking water	82%
With household drinking water	24%
With improved sewerage	56%
With household sewerage (2004)	7%
With 2 <sup>o</sup> sewage treatment	0%

### Water spending plans and performance

The 2001 National Water Management Plan seeks to spend USD17.9billion on water and sanitation between 2001 and 2025, with USD1.5billion pa budgeted for the first five years. Revenues cover 64% of O&M costs, with revenue collection at 60-85% efficiency, with total non-revenue water at 40-60%. No city is able to offer 24 hour water service as a norm.

<b>Freshwater</b>	
Annual availability (2007)	105km <sup>3</sup>
Per capita (2008)	656m <sup>3</sup>
Annual withdrawal (2007)	6%
Domestic (2007)	3%
Industrial (2007)	1%
Agriculture (2007)	96%

<b>Groundwater</b>	
Annual availability (1998)	34.0km <sup>3</sup>
Per capita	274m <sup>3</sup>
Annual withdrawal (1990)	3.4km <sup>3</sup>
Domestic (1979)	13%
Industrial (1979)	1%
Agriculture (1979)	86%

### City Study: The Dhaka Water and Sewerage Authority

Dhaka needs a minimum of 1.6billion L of water a day against a theoretical capacity of 1.35billion L a day and an actual production of 1.26billion L. Electrical problems mean 40% of the city's 370 wells do not work, while 600km of water pipes out of 2,000km need to be replaced. Average water consumption is 119 L per capita per day, costing USD0.40 per m<sup>3</sup>. In 1991, 59% of the population received piped water from 90,000 household connections and 1,200 communal taps. In 2005, DWASA served 75% of the city, including 5.5million with piped water (75% with continuous service) and 0.5million through public pipes. Dhaka's population is growing by 6% a year, of which 40% end up in the slums. The 2.5million people living in slums are not connected to the water system as they are not registered as landowners. Since 2000, the government has deployed the army to stop the theft of water supplies in the capital. Under the 1998 master plan, USD500million in investments have been identified for the period to 2013. The World Bank water treatment loan of USD80million has run into difficulties because of currency problems, so bilateral loans are being sought.

Of the city's population, 20% were connected to sewerage in 1984, rising to 44% by 1991, due to the World Bank supporting a secondary sewerage expansion project. By 2002, this had fallen to 30% due to population expansion, with 10% of effluents being treated. Dhaka's sewerage system currently serves 27% of the population. The World Bank estimates that up to USD8billion will be needed for the water supply and sewerage system over the next 20 years. Dhaka's effluent treatment capacity is 120,000m<sup>3</sup> a day, but only 50,000m<sup>3</sup> reaches the plant because the main sewer pipe is broken. The Fourth Dhaka Water Supply and Sanitation Project includes a USD3,159million scheme to improve Dhaka's sewerage network by 2020. The water table in Dhaka is falling by 3million per annum due to over-abstraction from 444 deep tube wells, which supply 88% of the city's demand.

### Veolia, Grameen and water micro finance

The 2006 Nobel Peace Prize winner, Muhammad Yunus has formed a joint venture between Grameen Bank and Veolia Water to provide water to poor rural communities in Bangladesh. Grameen-Veolia Water Ltd is 50% owned by Veolia Water AMI (Africa, Middle East, India) and 50% by Grameen Healthcare and aims to bring drinking water to more than 100,000 people for a total

investment estimated at EUR500,000 (USD790,000). In 2008, the first plant started to supply water suitable for cooking and drinking to 25,000 inhabitants of Goalhari, a village 100km from Dhaka.

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Dhaka	12,430,000	16,842,000	N/A
Chittagong	4,114,000	5,707,000	N/A
Khulna	1,494,000	2,048,000	N/A

Sources:

*ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Bangladesh, ADB, Manila*

*'Water of strife', John Vidal, The Guardian, G2, 27/03/2002*

**BELIZE**

The state held Water and Sewage Authority (WASA) was privatised in 2001. 10% of the shares in Belize Water Services Ltd (BWS) WASA's successor company were acquired by the Belize Social Security Board, 7.3% by the public and the remaining 83% was acquired by Cascal. BWS is responsible for urban and adjacent areas in Belize, accounting for in excess of 50% of the country's population. Belize had a population of 236,000 in 2002, 48% living in urban areas. The Water Law of 1970 gave WASA the right to manage all water services in Belize. In 1995, WASA handed over its involvement in rural areas to the ministry of rural development. BWS remains actively involved in these areas in a support capacity. In August 2005, these shares were bought back by the government in August 2005 for USD24.9million. These shares were subsequently sold to local and international investors for USD25.4million. As part of the original repurchase agreement, Cascal was awarded an O&M contract for BWS.

Three of the nine urban districts have sewerage (Belize City, Belmopan and San Pedro). Water in the island of San Pedro is provided through a desalination system provided by Consolidated Water. The San Pedro rate is subsidised by the government. In San Pedro, water costs BZD0.20 per gallon for the first 1,000 gallons per month. In Belize City the fee is BZD0.10. There is typically a 20% higher cost for regions where sewerage services are provided. Outside these areas, the typical rate is BZD0.075.

Distribution losses have been cut from 53% by BWS in 2001 to 35% in 2009 with the long term aim of achieving 10-15%. In 2002, water sales by volume grew by 12.5% on the completion of the Belize City Water Expansion Project and by an average of 7.5% pa between 2002 and 2005 and 2% to 2009. BWS had 39,400 customers in 2005 and 44,610 in 2009. Metering and billing is carried out on a monthly rate nationwide. Potable water is formally provided to 90% of the country, including all urban dwellers. 59% of the urban population had access to sanitation in 1994.

BWS's revenues have grown from BZD19.3million in 2001-02 to BZD29.7million for 2008-09. Due to the decrease in NRW water production has been unchanged during this period, while water sales grew from 1,334million gallons to 1,842million gallons. There were 10,323 sewer connections in 2009, a 3% increase during the period.

<b>Private Sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Belize	Urban water & sewage services, BOT	Cascal
San Pedro	Water provision, 23 year BOT	Consolidated Water

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Cascal	Sembcorp (Singapore)	125,000	70,000	<b>125,000</b>
Consolidated	Consolidated Water (USA)	7,000	0	<b>7,000</b>

**BOLIVIA**

<b>Economics (2008)</b>	
GNI per capita	USD1,460
GNI per capita (PPP)	USD4,140
GDP in agriculture	13%
GDP in industry	38%
GDP in services	48%

**Water and sewerage services**

In 1988, 89% of the urban population had access to piped water, with 32% having indoor taps. 70% had access to sanitation, including 42% with flush lavatories. Water provision on the city level was fairly consistent in 1998, but there were appreciable differences in sanitation and sewerage coverage.

	<b>Piped water</b>	<b>Indoors</b>
La Paz	97%	44%
Santa Cruz	83%	25%
Cochabamba	82%	59%
Oruro	96%	25%

	<b>Sanitation</b>	<b>Flush</b>
La Paz	68%	65%
Santa Cruz	95%	20%
Cochabamba	81%	61%
Oruro	45%	37%

In December 2002, Bolivia launched a five year, USD496million drinking water and sanitation project, aiming to extend drinking water to some 2.1million people (USD154million) and sewer infrastructure to about 2.3million people (USD265million), plus USD77million in capacity building and technical assistance. Aguas de Illimani was meant to invest USD30million in the plan.

<b>Population</b>	
2009 (million)	9.7
2020 (million)	11.6
Urbanisation in 2007	65.6%
Urbanisation by 2020	71.0%
Urbanisation by 2050	82.2%

**Cochabamba: the beginning of the end**

The Cochabamba concession process was a direct result of political support and multilateral funding. President Sanchez, during his rule from 1993-97, promoted PSP. The World Bank provided a USD14million loan to Cochabamba which was linked to promoting PSP and in October 1999, the Drinking Water and Sanitation Law (Law 2029) was passed enabling PSP to take place. SEMAPA, the municipal water utility provided water for four hours a day and had a record of poor and limited service. There is no evidence of local companies playing a lead role in water PSP in Bolivia.

The concession in Bolivia involved a 15-17% guaranteed US dollar rate of return, with exchange risk covered by tariffs. This was one of the reasons for the concession's swift collapse. The Cochabamba concession attracted a single proposal, which was then developed through negotiation. Aguas de Tunari was awarded the concession in October 1999 with the concession starting in January 2000. Law 2029 meant that the concession covered all water resources in its area and all actual and potential customers had to connect to the system and well owners were obliged to use the company's water irrespective of their ability to pay. No public consultation was taken either over the law or the concession process. Contract disputes were to be dealt with through the International Centre for the Settlement of Investment Disputes, the International Chamber of Commerce and the United Nations Commission on International Trade Law.

In April 2000, there was a week of rioting that left one dead and 175 injured after violent protests against the PSP. IWL withdrew from the project as a result. In January 2000 Aguas del Tunari

increased prices by 20% as stipulated by the government. Part of this increase was imposed by the government to recoup previous project costs. Since 2000, investment in water infrastructure has been frozen, due to the refusal of the protestors to allow charges for water. The Bolivian Government acquired 80% of Aguas de Tunari from Abengoa (25%) and International Water (Bechtel and Edison, 55%) for USD0.25(sic) in 2006. This ended the dispute between the parties.

In 2005, the water system covered 52.6% of households (56,148 connections) in an area of 599,302 people and was seen as performing well in terms of tariffs and financial stability, but less so on water quality and delivery (Sharma & Quinanila 2009).

### Urban data (2008)

With improved drinking water	96%
With household drinking water	93%
With improved sewerage	34%
With household sewerage (2004)	39%
With 2 <sup>o</sup> sewage treatment	11%

### La Paz & El Alto: the end of the beginning?

In January 2006, Bolivia's newly elected President Morales created a water ministry charged with renationalising water operations. Suez's La Paz and El Alto concession was targeted, as it is the only major concession in Bolivia. Abel Mamani, the water minister previously ran Fejuve, the anti-private sector pressure group operating in La Paz and El Alto.

Sisab, the Bolivian basic services regulator was meant to produce an audit about AISA's performance in order to justify the concession's rescindition. It appears that this audit has been withheld by the government, as previous audits have shown that AISA has performed at least to expectations. Indeed, Sisab gave AISA an A+ rating in April 2006 and qualified it as "Bolivia's best firm". AISA agreed to hand over the concession in October 2006 and it was handed over in January 2007.

### Bolivia battles on, with Spain's assistance

The political changes have been reflected in a fall in water finance. Annual investment in water and sewerage was USD48-69million between 1996 and 1999 and USD65million in 2000. Between 2001 and 2006, it has ranged between USD22-50million pa.

Bolivia's "Water, belonging to all and for all" declaration of 2007 states that "no one owns water; water belongs to the state and its protection, preservation and development is the responsibility of all inhabitants". In May 2007, Bolivia withdrew from the World Bank's International Centre for the Settlement of Investment Disputes (ICSID) and the ICSID convention. This is the arbitration mechanism for international disputes. The Bolivian government is expecting to sign a potable water and irrigation financial cooperation agreement with Spain to ensure that most of the USD1.5billion Water Fund for Latin America announced by Spain in 2007 will go to Bolivia. Bolivia intends to invest USD621million in 2008 for potable water services, water resources management and irrigation.

<b>Freshwater</b>	
Annual availability (2007)	304km <sup>3</sup>
Per capita (2008)	31,308 m <sup>3</sup>
Annual withdrawal (2007)	1%
Domestic (2007)	13%
Industrial (2007)	7%
Agriculture (2007)	80%

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Comments</b>
La Paz	1,533,000	1,817,000	Water and sewerage in limbo
Santa Cruz	1,352,000	1,932,000	N/A

### Another area of dispute

In April 2000, Bolivia's Ductec paid USD46million for the concession to distribute water from the Silala River/Springs. The company has been seeking to charge Chilean companies for using the water downstream where it flows into Chile. The Chilean companies claim that this water is from Chile and refuse to pay the USD4million pa that Ductec seeks. Ductec is threatening to build a dam which would divert the water away from Chile unless it is paid. In 2004, Chile's president Ricardo Lagos said that if technical and geological studies prove that the source is in Bolivia and thus not an international water, Chile would be willing to negotiate rates. In essence, this is a reverberation of the 1879 War of the Pacific, when Bolivia lost its Pacific seaboard to Chile. Water, as ever, is thus used as a tool in international diplomacy.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Silala Springs	Water rights and provision concession	Ductec

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Ductec	Ductec (Bolivia)	N/A	0	N/A

Sources:

Castro J P (2006) *Water Services in Latin America: Public or Private? (Discussion of Four Case Studies)*. MSc Thesis, Erasmus University, Rotterdam

Dalton G. (2001) 'Private sector finance for water sector infrastructure: what does Cochabamba tell us about using this instrument?' *Water Issues Study Group, School of Oriental and African Studies (SOAS), University of London (Occasional Paper No 37, 2001)*

Harris C (2003) *Private Participation in Infrastructure in Developing Countries: Trends, Impacts, and Policy Lessons*. World Bank Working Paper No. 5. World Bank, Washington DC

Sharma SK & J.J. S. Quintanilla JJS (2009) *Sustainability analysis of water supply systems in Cochabamba, Bolivia*. 34<sup>th</sup> WEDC International Conference, Paper 716. WEDC, Loughborough, UK

Slattery K (2003) *What Went Wrong? Lessons from Cochabamba, Manila, Buenos Aires, and Atlanta*. *Water & Wastewater Annual Privatization Report*, The Reason Foundation. Los Angeles USA

World Bank & PPIAF (2006) *Approaches to Private Participation in Water Services: A Toolkit*, Appendix A. World Bank, Washington DC



**BRAZIL**

<b>Economics (2008)</b>	
GNI per capita	USD7,300
GNI per capita (PPP)	USD10,080
GDP in Agriculture	7%
GDP in Industry	28%
GDP in Services	65%

**Regulation and legislation**

In 2000 the Brazilian Government passed a law to establish the Agência Nacional de Águas (ANA), a new federal regulatory agency responsible for the implementation of the National Water Resources Policy and for co-ordinating the National System of Water Resources Management. The agency will have financial and administrative autonomy, and will be linked to the Ministry of the Environment. In Brazil, there are 27 state water and sewage companies serving 89million people (72% of the urban population) in 3,823 municipalities (69% of the total).

Each of the 26 states and the Federal District manage water under state jurisdiction. At the river basin level, 43 Basin Committees have been established to date, 39 of these at state level and 4 in basins of rivers under Federal jurisdiction. Around 50% are found in the south east. The Water Law of 1977 established the principle of decentralised and participatory management, with the discussion on the best management practices with local users. A law on pricing provisions has been adopted in 14 states and in the Federal District, with the aim of full cost recovery through billing. One of the main strategies of the National Sanitation Policy is to improve the level of efficiency of service providers and co-ordination of public and private efforts in order to optimise the upgrading and expansion of service cost without incurring excessive costs.

In March 2004, Brazil's lower house approved a bill aimed at promoting public-private partnerships in water and wastewater. If fully enacted, the bill will require projects to have an environmental license and guarantees on the part of the private sector in the form of bid and performance bonds. The Sao Paulo state government is understood to be planning to create a state controlled company, Companhia Paulista de Parcerias, which would manage public-private partnership projects. In June 2004, a law (10.881/2004) was passed regulating contracts for river water use between companies and municipal water works and the National Water Agency (ANA). Water basin committees will receive authority to set up water companies or choose a company to manage the water in their area. This will encourage water basin regions to start charging for river water.

In 2005, Brazil approved a National Water Resources Plan (PNRH) for 2006-16, which is designed to secure water supplies to people currently unserved, while safeguarding some of the world's richest aquatic life. The National Water Resources Plan aims to double the number of inhabitants served with potable water and sewage systems between 2005 and 2015. The plan details the current water resources in the country and projects a scenario with targets for 2020, with guidelines for a greater rationalization of the country's water supplies.

<b>Population</b>	
2009 (million)	193.7
2020 (million)	219.2
Urbanisation in 2008	85.6%
Urbanisation by 2020	89.5%
In urban agglomerations, 2050	93.6%

**National Plans**

The national sanitation regulation bill aims to encourage the operation of state sanitation utilities and private sector players by putting the responsibility of sanitation regulation on states, but also allows for the responsibility to be delegated to municipalities, or shared between states and municipalities.

In 2007 Lei 11.445/07 para o saneamento básico (water and sanitation services law) came into force, with the aim of increasing investments to provide universal access to water and sanitation, while allowing for flexibility regarding account circumstances and the ability of people to pay for these services. A Program for the Acceleration of Growth (PAC) was also launched, for upgrading Brazil's infrastructure. USD205billion will be provided by state owned companies and the private sector and

USD30billion by the Federal Government. This plan includes raising sewerage connections nationally from 35% to 75% by 2018. The PAC will invest BRL38.3billion (USD23.5billion) in basic sanitation by 2010. The water and sewerage department of the cities ministry believe that the sector needs a BRL200billion (USD123billion) investment.

Brazil's government plans to expand potable water services to 87% of the country and to have sewerage services reaching 55% of the population by 2010. This will cost BRL11billion a year. Of that total, some BRL1billion will come from the national budget, BRL2billion from the PPI pilot investment programme, and at least BRL3billion from the federal workers' unemployment insurance fund (FGTS). More than BRL3billion would come from another fund, the FI-FGTS. According to a report by the Instituto Trata Brasil released in April 2008, Brazil needs to invest BRL11billion in basic water and sanitation services every year for 20 years, while the government plans to invest BRL10billion per year, starting in 2008, but only for the next four years.

### Infrastructure development

The table below outlines the regional development of water, sewerage and sewage treatment in Brazil in 1991. The column for treated sewage refers to the percentage of sewage collected that is subject to treatment.

%	Water	Sewerage	Treated
North	82%	4%	24%
N East	87%	16%	72%
S East	93%	57%	32%
South	96%	18%	33%
West	87%	35%	40%
<b>Total</b>	<b>91%</b>	<b>35%</b>	<b>38%</b>

The National Sanitation Policy seeks to develop universal access to water and sewerage services in urban areas, with at least 80% of effluents subject to treatment by the year 2010. In 1995, 15.6% of urban sewage effluents were treated.

### Water supply

	1970	1980	1997
Urban	61%	79%	91%
Rural	3%	5%	20%

### Sewerage

	1970	1980	1995
Urban – network	22%	37%	48%
Urban – septic tanks	25%	23%	23%
Rural – network	1%	2%	3%
Rural – septic tanks	3%	7%	11%

In 1995, 92.8% of water produced and distributed through the domestic supply network was treated. Studies in 2000 by the Ministry of Health and BNDS, the state development bank, found that 18,250 people die each year as a result of inadequate basic sanitation, with 65% of all infant admissions to hospital as a result of infections related to solid or liquid waste.

According to the Ministry of Cities in 2003, Brazil needs to invest around USD62billion in sanitation and water supply programs by 2020 to meet urban service needs. 45million Brazilians who live in urban and rural areas do not have access to water supplies. More Brazilians had telephone lines, refrigerators and television sets in 2002 than access to a proper sewage system, a government study showed.

### Urban Data (2008)

With improved drinking water	99%
With household drinking water	96%
With improved sewerage	87%

With household sewerage (2004)	53%
With 2 <sup>o</sup> sewage treatment	25%

### Market structure and the private sector

Water and sewerage services to urban areas are provided through two contract types. They can either be granted through concessions to state sewerage companies for 25 to 50 years or by direct management through autonomous departments. In some cases, the latter is provided with assistance from the Ministry of Health via the National Health Foundation.

	<b>Water</b>	<b>Sewerage</b>
<b>Total</b>	<b>7,327</b>	<b>1,544</b>
Concessions	4,753	686
Direct mgt	2,024	583
Assisted by MFH	625	185

There are 27 concession companies (County Water and Sewerage Service companies), all of whom serve more than 100,000 people and supply water to 78% of the urban population and sewerage services to 64%. Contracting out to the private sector as opposed to commercialisation and the partial flotation of municipal concession holders remains at an early stage. In total, there are some 1,350 water and sewerage entities in Brazil, of which 32 were operated by the private sector in 2005 and by 2008 there were 40 private companies providing sanitation services to about 7million people in 63 Brazilian municipalities. This excludes companies which have been partially placed under private management through share issues such as SABESP.

Problems affecting other entities are not going away and in 2008 State-run water and sewage utilities gained BRL600million to assist in financing projects, purchase equipment and improve management. At least 11 of the 25 Brazilian State-run waterworks companies are in serious financial distress.

### Brazil's leading water entities (BRLmillion, 2005)

Companhia de Saneamento Basico do Estado de São Paulo – Sabesp	4,397.1
Companhia Estadual de Aguas e Esgotos – Cedae	1,506.3
Copasa	1,194.4
Companhia de Saneamento do Parana – Sanepar	1,031.7
Companhia Rio Grandense de Saneamento – Corsan	753.7
Empresa Baiana de Aguas e Saneamento – Embasa	573.9
Companhia de Saneamento de Goias – Saneago	448.7
Companhia de Saneamento Ambiental do Distrito Federal – Caesb	443.0
Companhia Pernambucana de Saneamento – Compesa	420.5
Companhia de Aguas e Esgotos do Ceara – Cagece	335.5

Source: Valor Economico August 2005, cited in COPASA's February 2006 IPO document

<b>Freshwater</b>	
Annual availability (2007)	5418km <sup>3</sup>
Per capita (2008)	28,223m <sup>3</sup>
Annual withdrawal (2007)	1%
Domestic (2007)	20%
Industrial (2007)	18%
Agriculture (2007)	62%

### Financing service extension

The estimated cost for investments necessary to develop an urban water supply, sewerage and sewage treatment service network is BRL50billion (USD20billion) by 2017. The government estimates that Brazil requires overall investments of BRL178billion (USD81.1billion) by 2025. Of this total, approximately BRL110billion is needed to provide universal sewage collection and treatment.

<b>USDbillion</b>	<b>Water</b>	<b>Sewage</b>	<b>Total</b>
Invested, 1970-98	11.0	6.0	<b>17.0</b>
Needed, 1999-10	5.6	25.4	<b>31.0</b>

PPP for smaller scale water and sewerage projects are being encouraged by the government through a bill introduced in May 2006 which opens up expressions of interest regarding areas where 50million people are currently unserved. Bahia state is currently looking at tenders for a public-private partnership covering sewerage services. Sab Esp's Alto Tietê water supply PPP has to increase water treatment capacity by 50% at one of the main water treatment plants in the São Paulo metropolitan region at a cost of BRL270million.

The BRL40billion (USD22.5billion) 2007 PAC growth plan has been slow in delivering its objectives for sewerage extension. By 2010, 15% of projects had been completed. However by that time, USD15.6billion of contracts had been agreed with the aim of completing 86% by the end of 2010.

Some regional targets

State	Utility	Timescale	Current	Planned
Rio Grande do Sul	Corsan	2009-11	13%	30%
Rio Grande do Norte [1]	Caern	2009-14	33%	73%

[1] For Natal, the state capital

Groundwater	
Annual availability (1998)	1,874.0km <sup>3</sup>
Per capita	11,347m <sup>3</sup>

### Private sector players

The three main private sector partnerships are more than holding their own in Brazil. In 2005 Cop Asa increased its number of water concessions from 595 and sanitation services from 152 in 2004 to 608 and 170, respectively. In the same period Sanepar renewed nine municipal contracts and gained one additional 30-year concession for water supply and sanitation services in the municipality Bom Jesus do Sul, with operations in 343 of the state's 399 cities.

According to Valor Econômico (BN Americas 3<sup>rd</sup> September 2008) the private sector operates 9.8% of services in Brazil's basic sanitation sector, compared with 6% of services in 2006 and 7.5% in 2007. The increase in 2008 is for 3.2million people via seven new contracts. The report states that the private sector aims to cover 30% of the market in 10 years.

The Envisager database estimates that at the end of 2009, 26% of the country was served by outsourced activities for water and 19% for sewerage.

Company	State	Population served	Water connections
CEDAE	Rio de Janeiro	9,700,000	1,500,000
CESAN	Esprito Santo	1,700,000	353,000
COMPESE	Pernembuco	5,100,000	1,000,000
EMBASA	Bahia	6,800,000	1,600,000
Municipal			
Campo Grande	Mato Grosso do Sul	607,299	146,112
Cuiaba	Mato Grosso	539,692	105,883
Itu	Sao Paulo	34,404	112,000
Novo Hamburgo	Rio Grande do Sul	44,210	192,274
Vareza Grande	Mato Grosso	36,217	192,979

Waterworks concessionaire Aguas de Niterói has invested BRL148million (USD70.1million) since 2001 to extend water and sanitation services in Niterói, the second biggest city in Brazil's Rio de Janeiro state. Aguas de Niterói won the 30 year Niterói concession in 1999, and since opening operations the company has increased the supply of potable water from 46% in 1999 to 100% today; the concessionaire also collects and treats 75% of the city's sewage, up from 20% in 1999 and well above the national average. Besides building the wastewater treatment plants, major investments have included the installation of infrastructure to expand the potable water supply and sewage collection.

<b>Brazil – Local concession projects</b>			
<b>Municipality</b>	<b>Concessionaire (operator)</b>	<b>Population</b>	<b>Comments</b>
Aracatuba, SP	Sanear (Amafi, Multiservice)	157,467	Sewerage
Birigul, SP	Aquaperola (Isratec, Hidroge)	84,016	Bulk water
Cajamar, SP	Aguas de Cajamar (Multiservice)	33,707	Water
Campos, Rio	Aguas de Paraiba (Cowan)	350,000	Water & sewerage
Itu, SP	Cavo Itu (Cavo, Camargo Correa)	112,939	Sewerage
Jau, SP	Aguas de Marigada (Multiservice)	97,354	Water
Jau, SP	Consortio SR Almeida, Silec	97,354	Sewerage
Jundiai, SP	Cia Saneamento de Jundiai	288,644	Sewerage
Mairinque, SP	Cia Agua (Grupo Villanova)	35,000	Water and sewerage
Marilia, SP	Aguas de Marilia (Hidroge)	173,841	Bulk water
Mineiros do Tiete, SP	Saneciste	9,462	Water and sewerage
Niterói, Rio	Aguas de Niterói (Cowan, Carioca)	448,736	Water and sewerage
Ourinhos, SP	Aguas de Esmeralda (Multiservice)	79,148	Bulk water
Ourinhos, SP	Telar Engineering	79,148	Sewerage
Paranagua	Aguas de Paranagua (Castilho)	110,000	Water and sewerage
Pereias	Novacon	4,850	Water and sewerage
Petropolis, Rio	Aguas do Imperador (Cowan)	263,838	Water and sewerage
Regia dos Lagos I, Rio	Aguas de Juturnaiba (Cowan)	200,000	Water and sewerage
Regia dos Lagos II, Rio	Prolagos (ADP, Monteiro Aranha)	N/A	Water and sewerage
Ribeirao Preto, SP	Ambient (CH2M Hill, Rek)	450,960	Sewerage
Salto, SP	Saneciste de Salto (Saneciste)	100,000	Sewage treatment
Tuiuti, SP	Ribeirao Pantano Tuiuti (Novacom)	3,000	Water and sewerage

Source: Adapted from Global Water Report, p11, 204, 08-10-2004

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Sao Paulo	18,333,000	20,535,000	SAPESP partially floated
Rio de Janeiro	11,469,000	12,770,000	CEDAE flotation postponed
Belo Horizonte	5,304,000	6,354,000	COPASA floated in 2006
Porto Alegre	3,795,000	4,096,000	N/A
Recife	3,527,000	3,830,000	N/A
Brasilia	3,341,000	4,282,000	N/A
Salvador	3,331,000	3,950,000	EMBASA PSP under way
Fortazela	3,237,000	3,850,000	N/A
Curitiba	2,908,000	3,581,000	N/A
Campinas	2,634,000	3,003,000	N/A
Belem	2,043,000	2,524,000	N/A
Grande Vittoria	1,613,000	1,974,000	N/A
Santos	*1,634,000	1,890,000	N/A
Manaus	1,645,000	2,059,000	Manuas Saneamento sold to Suez in 2000
Goiânia	1,898,000	2,372,000	N/A
Natal	1,035,000	1,253,000	N/A
Grande Sao Luis	990,000	1,192,000	N/A
Sao Jose de Campos	*972,000	1,560,000	N/A
Catarinense	*936,000	1,131,000	N/A
Maceió	1,116,000	1,391,000	N/A
João Pessoa	918,000	1,087,000	N/A
Teresina	872,000	1,029,000	N/A

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Dos Lagos	25 year water and sewerage concession	ProLagos
Nova Friburgo	25 year concession, water and sewerage	Multiservice-engenharia
Jau	25 year DBFO, wastewater	Multiservice-engenharia
Sabesp	Sale of 49% of Sao Paulo's stake	Sao Paulo / SABESP
Sanepar	Sale of 30% of Sanepar by Parana	Andrade Gutierrez
Manuas	Water & sewerage concession	Suez

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Brusque	Deep shaft STW BOT	Cejen
Campo Grande	Water and sewerage concession	Aguas Guariroba
Minas Gerais	Sale of 30% of COPASA in 2006	COPASA
Bedford Roxo	Water & wastewater concession	Grupo Equipav
Palestina	30 year Water & wastewater concession	CAB Ambiental
Alto Tiete	15 year water concession	CAB Ambiental
Paranagua	17 year wastewater concession	CAB Ambiental
Guaratingueta	30 year wastewater concession	CAB Ambiental
Mirassol	30 year Water & wastewater concession	CAB Ambiental
Alta Floresta	22 year Water & wastewater concession	CAB Ambiental
Pontes de Lacerda	23 year Water & wastewater concession	CAB Ambiental
Colider	23 year Water & wastewater concession	CAB Ambiental
Aracoiaba	25 year Water & wastewater concession	Grupo Aguas do Brasil
Resende	30 year Water & wastewater concession	Grupo Aguas do Brasil
Goytacazes	45 year Water & wastewater concession	Grupo Aguas do Brasil
Niterói	45 year Water & wastewater concession	Grupo Aguas do Brasil
Lakes Region	25 year Water & wastewater concession	Grupo Aguas do Brasil
Petropolis	25 year Water & wastewater concession	Grupo Aguas do Brasil

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
SABESP	San Paulo municipality	23,400,000	19,600,000	<b>23,400,000</b>
COPASA	Minas Gerais municipality	12,800,000	7,500,000	<b>12,800,000</b>
Sanepar	Andrade Gutierrez (Brazil)	9,018,000	5,444,000	<b>9,018,000</b>
Cejen	Riovivo (Brazil)	0	200,000	<b>200,000</b>
Bedford Roxo	Grupo Equipav (Brazil)	400,000	400,000	<b>400,000</b>
ProLagos	Grupo Equipav (Brazil)	360,000	360,000	<b>360,000</b>
Aguas Guariroba	Grupo Equipav (Brazil)	730,000	520,000	<b>730,000</b>
Multiservice-engenharia	Grupo Aguas (Brazil)	180,000	305,000	<b>305,000</b>
Grupo Aguas do Brasil	Grupo Aguas (Brazil)	932,000	932,000	<b>932,000</b>
Aguas de Limeira	SE (France)	256,000	256,000	<b>217,000</b>
Manuas Saneamento	SE (France)	1,400,000	1,200,000	<b>1,400,000</b>
CAB Ambiental	CAB Ambiental (Brazil)	3,684,000	265,000	<b>3,940,000</b>

The Envisager database has identified a total of 63 PSP contract awards, 60 of which continue to be in operation.

**CAMBODIA**

During 1999-98, the Ministry of Industry, Mines and Energy awarded four local private sector contracts to secondary towns in the country. These contracts were awarded to local operators under unsolicited bids and the operators' identities have not been revealed. While labelled as BOT contracts, they are in fact being operated as full concessions with operating lives of 23-40 years. In each case, the number of people served refers to the percentage of the town's population that is actually connected. According to Castalia, these contracts have performed to expectations, although no provision has been made for access to poorer households. Coverage in Cambodia's other 19 secondary towns range from 5-9%.

<b>Cambodia – Local projects</b>			
<b>Project</b>	<b>Operator</b>	<b>Population</b>	<b>Comments</b>
Banteay Meanchey	N/A	8,000	Commenced 1998, 8% of households connected
Kompong Speu	N/A	8,000	Commenced 1997, 20% of households connected
Kien Svay	N/A	1,000	Commenced 1998, 2% of households connected
Takeo	N/A	2,000	Commenced 1997, 6% of households connected

**Urban Data (2008)**

With improved drinking water	81%
With household drinking water	55%
With improved sewerage	67%
With household sewerage (2004)	23%
With 2 <sup>0</sup> sewage treatment	0%

A National Water Resources Policy was adopted in 2004, with legislation on Water Resources Management being passed in 2007. 2015 targets are for 80% safe water coverage and 74% with safe sanitation. USD114million is budgeted for water and sanitation projects from 2007 to 2009.

**Transforming service delivery in Phnom Penh**

Phnom Penh's Water Supply Authority was corporatised in 1996. Between 1996 and 2001 it received USD94million of donor assistance and USD56million in loans from the ADB, the World Bank, JICA, and the French Government. The transformation of the city's utility performance is one of the most dramatic on record.

In 1993, there were 25,960 recorded customers, 12,980 of which did not receive water and 13,901 'customers' who did receive water but were not registered. The distribution network was refurbished between 1994 and 1999 and the network expanded from 2000. From 1998, a programme to regain the public's trust in the utility and to encourage billing payments went into operation, including improved information availability and simplified payments. Tariffs were revised in 1997 and 2001 and have been unchanged since.

<b>Service delivery, 1993-09</b>	<b>1993</b>	<b>1995</b>	<b>2000</b>	<b>2005</b>	<b>2009</b>
Connections	26,881	28,654	67,016	138,226	192,514
Metered connections	3,391	15,023	66,905	138,226	192,514
Collection efficiency	48.0%	50.0%	99.5%	99.8%	99.9%
Non revenue water	73.0%	64.0%	33.0%	9.0%	5.9%
Revenues (million Riels)	1,400	5,500	25,125	64,679	105,780
Gross profit (million Riels)	-700	1,300	4,191	23,380	33,313

The utility has been transformed between 1993 and 2009. Staff per 1,000 connections fell from 20 to 3.2. Water quality now meets WHO standards, with production having increased from 65,000 m<sup>3</sup> per day to 300,000 m<sup>3</sup> per day. The coverage has increased from 20% to 90% with pressure at 2.5 bar against 0.2 bar and 24 hours per day water delivery against 10 hours per day. The reduction in non revenue water has resulted in a saving of 165,000 m<sup>3</sup> of water per day, equivalent to USD100million in water treatment facilities.

A water for all programme has connected 18,862 low income families between 1993 and 2009, providing subsidies of USD5 per family per month, through lowering the connection cost and USD5million in lower tariffs.



### **Wastewater remains an area of concern**

Phnom Penh's Water Supply Authority has 147,000 connections covering 83% of the city and was corporatised in 1996. Between 1996 and 2001 it received USD100million of donor assistance from the ADB, the World Bank, JICA, and the French Government. This has resulted in non-revenue water falling from 72% in 1993 to 6% by 2005 and water provision rising from 10 to 24 hours per day, along with universal metering.

There are currently no wastewater collection systems in Cambodia. There is a pilot project underway for one area of Phnom Penh which is funded by the World Bank (approved in April 2003). However, funding for sanitation and hygiene promotion and activities has generally been limited in Cambodia, and has not been a priority in budget allocation. Research on the sector shows that, if they can afford to, most residents invest in on-site sanitation (i.e. construct pit latrines and septic tanks). In contrast, poor families use river banks and canals for excreta disposal. As a result, Cambodia has one of the highest infant mortality and morbidity rates in the world caused by water-related contamination.

#### *Sources:*

*ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Cambodia, ADB, Manila*

*Andrews, C. & Yñiguez, C. (eds) 2004. Water in Asian Cities: Utilities' Performance and Civil Society Views. ADB, Manila, Philippines*

*Castalia (2004) Sector Note on Water Supply and Sanitation for Infrastructure in East Asia and the Pacific Flagship, Review by Castalia for the World Bank, ADB and JIBC*

*Garn, M., Isham, J. and Kähkönen, S. (2000) "Should We Bet On Private or Public Water Utilities In Cambodia? Evidence on Incentives and Performance from Seven Provincial Towns" Middlebury College Economics Discussion Paper 02-19, Vermont, USA*

*Chan E S (2010) Transforming Phnom Penh Water Utility, Presentation to the GWI Water Summit, Paris, France, April 2010*

**CANADA**

<b>Economics (2008)</b>	
GNI per capita	USD43,460
GNI per capita (PPP)	USD38,170
GDP in Agriculture	3%
GDP in Industry	31%
GDP in Services	66%

**Regulation**

Canada has 9% of the world's renewable water resources and 20% of the world's freshwater when its glaciers are included, while accounting for 0.5% of the world's population. 60% of Canada's freshwater drains North, while 90% of the Canadian population lives in the South, where pollution and escalating demand are increasing pressure on freshwater resources.

The Federal Water Policy (1987) encourages full-cost pricing of all water use. The territorial or municipal governments set water fees for water use in communities. Provincial legislation such as the 1996 Alberta Water Act promotes water conservation, strengthens licensing and restricts interbasin diversion. Other federal legislation includes the Canada Water Act (1970), the International River Improvements Act (1955), the Canadian Environmental Assessment Act (1996), the International Boundary Waters Treaty Act (1911), the Canadian Environmental Protection Act (1988) and the Navigable Waters Protection Act (1993).

<b>Population</b>	
2009 (million)	33.6
2020 (million)	36.4
Urbanisation in 2008	80.4%
Urbanisation by 2020	82.0%
Urbanisation by 2050	87.9%

Sewerage service penetration reached 75% in 1994, with 93% of the effluents collected by the sewerage network receiving treatment, compared with 85% in 1991.

**Development of sewage treatment, 1981-2004**

	<b>1981</b>	<b>1986</b>	<b>1991</b>	<b>1996</b>	<b>2004</b>
None	N/A	N/A	N/A	N/A	3.4%
Primary	25.0%	27.0%	32.0%	33.0%	28.7%
Secondary	25.0%	23.0%	25.0%	24.0%	47.0%
Tertiary	14.0%	13.0%	18.0%	18.0%	20.9%

The target is to provide 100% of the population with potable water and with 100% sanitation coverage. In 1998, 90% of the population had access to potable drinking water, with 85% served by sewerage and some 80% of collected sewage effluents treated to at least the secondary level. Before usage approximately 81.5% of drinking water receives some form of treatment.

For the municipal sector, providing a complete water supply service plus secondary waste treatment in all municipalities is estimated to cost from CAD50 to CAD90billion. This includes the cost of upgrading, renovation, expansion, and associated operating costs. The estimated value for the municipal water utility systems is about CAD110billion. In May 2001, the Federation of Canadian Municipalities estimated that over CAD16.5billion will be needed to upgrade the water infrastructure over the next 10 years.

### Summary of water and wastewater capital spending surveys

Source & date	Period	CAD billion	Comments
Peat Marwick (1994)	1995 – 2015	41	Additional spending
FCM / McGill (1996)	1997 – 2007	80–90	New & upgraded infrastructure
NRTEE (1996)	N/A	38–39	Maintain extant services
CWWA (1997)	1997 – 2012	88	New & upgraded infrastructure

Sources:

*Peat Marwick (1994) "Introduction to Public-Private Partnerships" Proceedings of the 23rd Annual Technical Symposium and Exhibition of the Water Environment Association of Ontario, Toronto ON; (FCM & McGill): Federation of Canadian Municipalities and McGill University (1996) Report on the State of Municipal Infrastructure in Canada. Ottawa ON*

*(NRTEE): National Round Table on the Environment and the Economy (1996) State of the Debate: Water and Wastewater Services in Canada. Ottawa ON*

*(CWWA): Canadian Water and Wastewater Association (1997) Municipal Water and Wastewater Infrastructure – Estimated Investment Needs 1997-2012 Ottawa ON*

In 2003, it was found that water leakage in Montreal was 37% against the national average of water system losses of 13%. According to PriceWaterhouseCooper, updating the system will cost the city CAD4billion over 20 years.

Urban Data (2008)	
With improved drinking water	100%
With household drinking water	100%
With improved sewerage	100%
With household sewerage	100%
With 2 <sup>o</sup> sewage treatment	72%

### Water usage

Between 1991 and 1994, daily municipal water use fell by 3.3% in per-capita terms and fell overall despite a 2% increase in municipal population receiving water services, over the same period. This decrease is a result of declines in commercial and industrial uses; probably because of the recession and a reduction in economic activity.

### Municipal water use, by sector (1994)

Domestic	52%
Industrial	17%
Commercial	18%
Distribution losses	13%

Total daily residential water use increased slightly and continued to account for more than half of all municipal water use in 1994. On a per person basis, daily residential water use fell from 334L per person in 1991 to 331L per person in 1994, a decrease of just under 1%. In 1994, Canadian households paying for water by volume used 263L per person per day, 39% less water than households paying a flat rate, which used 430L per person per day. The percentage of Canada's municipal population with water meters increased from 52.4% to 54.3% between 1991 and 1994.

Freshwater	
Annual availability (2007)	2,850km <sup>3</sup>
Per capita (2008)	85,556m <sup>3</sup>
Annual withdrawal (2007)	2%
Domestic (2007)	20%
Industrial (2007)	69%
Agriculture (2007)	11%

### Prospects for the private sector

While the private sector is typically regarded as having a minimal role in Canada's water and sewerage services, the reality is that of a steadily increasing presence. In the wake of the Walkerton tragedy, in which polluted water killed seven people in Ontario in 2000, a number of national and regional plans have been carried out. It transpired that the municipality has run down its water testing and network maintenance operations to cut costs. In 2004, Ontario's Liberal government indicated that private-sector participation may be considered in the wake of rising capital spending needs and these service shortcomings. However, subsequent developments have been marginal to date.

The proposed Safe Drinking Water Act will require mandatory licensing of all water testing laboratories and owners of municipal water systems and tighten standards for drinking water treatment and distribution. A proposed Sustainable Water and Sewage Systems Act will require municipalities to recover the full cost of water and sewer services from consumers.

Aquatech has been in operation since 1981 and has 50 water and wastewater contracts covering 0.8million people. The company believes that it controls 60% of the private sector market share in Canada. There are three smaller operations in Canada, mainly operating at the O&M level.

Ontario's provincial government commissioned an expert panel to write a report in 2005 which recommends that the private sector is considered in future policy options. The report recommends that counties, single tier municipalities and regional municipalities prepare business plans on how they will amalgamate water systems within their boundaries to achieve greater cost efficiencies. In Ontario, the number of water or wastewater facilities operated by private firms increased from 26 in 1998 to 42 in 2001. By 2006, one service provider estimated that between 50 and 75 Ontario systems were privately operated.

<b>Groundwater</b>	
Annual availability (1998)	369.60km <sup>3</sup>
Per capita	12,241m <sup>3</sup>
Annual withdrawal (1990)	1km <sup>3</sup>
Domestic	43.3%
Industrial	14.2%
Agriculture	42.5%

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Toronto	5,312,000	5,938,000	One wastewater DBO
Montréal	3,640,000	3,897,000	N/A
Vancouver	2,188,000	2,389,000	N/A
Ottawa	1,156,000	1,262,000	N/A
Edmonton	1,015,000	1,118,000	N/A
Calgary	1,058,000	1,193,000	N/A

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
York	Water strategy development	US Water
Moncton	20 year water provision PPP	US Filter
Toronto	15 year wastewater DBO	US Filter
Brockton	5 year water & wastewater O&M	US Filter
Haldimand	Wastewater O&M	US Filter
Lake Huron	10 year water O&M	Azurix NA

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
US Filter	VE (France)	127,000	1,238,000	<b>1,331,000</b>
Aquatech	Aquatech WMS (Canada)	88,000	768,000	<b>800,000</b>
US Water	AWW (USA)	600,000	0	<b>600,000</b>
Azurix NA	AWW (USA)	420,000	0	<b>420,000</b>

*Sources:*

*A breath of fresh air (2007) Market Solutions for Improving Canada's Environment, Fraser Institute, Canada*

*Ontario Government (2005) Watertight: The Case for Change in Ontario's Water and Wastewater Sector, Ontario, Canada*

**CHILE**

<b>Economics (2008)</b>	
GNI per capita	USD9,370
GNI per capita (PPP)	USD13,250
GDP in Agriculture	4%
GDP in Industry	44%
GDP in Services	52%

**Development of regulation**

Urban water provision and sewerage services have been in continuous development over the past 150 years. By the end of the 1970s, a large number of public services delivered drinking water or collected wastewater in the main cities of Chile, whose urban population then was 8.5million. Services were provided by the municipality, along with a number of private companies delivering drinking water and providing sewerage services in the upper part of the city. Sewerage was seen as under-developed and there were no sewage treatment works. As sewerage tariffs were notably low, any extension of sewerage coverage was entirely dependent on government funding. In 1977, water and sewerage activities were integrated on a regional basis. Two semi-autonomous utilities were created, EMOS in the metropolitan region and ESVAL, along with 11 regional services. A regulatory body, SENDOS, reporting to the Ministry for Public Works was also established. During the 1980s, EMOS started to contract out some maintenance activities.

The PSP process in Chile has been a relatively gradual one. The regulations enacted in 1988 outlining full cost recovery for water utilities and setting the state's responsibilities in overseeing a contract meant that the capacity building processes were taking place a decade before the PSP process formally began. During the 1990s, Santiago (and the other 11 Chilean water utilities) were commercialised with, at the outset, full PSP in mind. While the process was open to local companies, the larger contracts, especially Santiago were developed to attract trans-national companies.

In Chile, Aguas Andinas is regulated by SISS, which is in turn monitored by the Ministry of Public Works. SISS can impose fines for non-compliance. Tariff disputes between AA and SSIS are to be resolved through a panel of experts mediating between the propositions. AA has recourse to the national courts in legal disputes with SISS. Coverage targets are monitored annually and reviewed every five years within the context of a 15 year investment plan. These plans are made available to the public.

While water and sewerage coverage increased, the low level of tariffs did not allow these services to grow in terms of maintenance of the new systems and in terms of maintenance, rehabilitation and replacement of old systems. As a result, in 1989 a set of laws and regulations were passed and a regulatory body, totally separated from operational activities, was created. The reform also included laws that allowed the selling of EMOS and ESVAL to the private sector.

EMOS and ESVAL were transformed into corporatised entities and their shares entrusted to CORFO, a government body. The companies follow regulations applied to private companies, although their annual budget has to be approved by the Finance Ministry. From 1990 to 1995, their tariffs rose by 70% so as to eliminate central government subsidies and to enable capital spending to be enhanced. During this period, urban water and sewerage coverage reached the highest levels of Latin America. The first sewage treatment works were built at the beginning of the 1990s, the first in Santiago being built in 1992.

Since 1995, the government has concentrated on encouraging the PSP of major water and sewerage entities through a series of share sales. In 2001, the government has shifted from outright PSP (asset sales on the England & Wales WaSC model) to 30 year BOT concessions. MOP, the public works ministry, a new regulator was created during 2007, along with a revised concession legislation designed to improve the transparency of the process.

The Chilean Government set 2006 as the target date for all wastewater to be treated governed by standards relating to the discharge of industrial wastewater. Decree 90 required 760 industries to submit reports by the end of 2005 about their discharges.

15 water utilities raised their water tariffs by more than 3% from November 2005 in line with inflation. The increase can result from inflation, variations in the country's tariffs decree, new tax indexes or

higher costs due to wastewater treatment, among other factors. Every time any of these factors accumulates an increase of more than 3%, utilities are entitled to raise their tariffs. In contrast, 22 water utilities lowered their rates on items such as potable water and sewerage services in 2006. For example, Aguas Andinas' rates will fall by between 2.37% and 3.53% depending on location. The rates decrease is based on SISS's examination of the different costs for national and imported products and supplies of each utility, which is reviewed every five years. Chile's water rates are defined every five years by a decree.

<b>Population</b>	
2009 (million)	17.0
2020 (million)	18.6
Urbanisation in 2008	88.4%
Urbanisation by 2020	91.0%
Urbanisation by 2050	94.2%

### Development of services

Capital spending in 1995 US dollar terms has only recently picked up. In 1960-65, USD400million was spent, falling steadily to USD200million in 1976-80. In 1981-85 it recovered to USD325million, easing to USD325million in 1986-90 before reaching USD839million in 1991-95.

%	Water	Sewerage	Treatment
1965	53.5	25.4	0.0
1970	66.5	31.1	0.0
1975	77.4	43.5	0.0
1980	91.4	67.4	0.0
1985	95.2	75.1	0.0
1990	97.4	81.8	8.0
1995	98.6	89.2	14.0
1998	99.3	91.6	16.7
2000	N/A	N/A	31.0
2004	99.7	98.4	72.0
2008	99.8	95.3	82.6

Sewage treatment coverage is planned to rise to 98.7% by 2014.

Chile needs USD2.5billion in capex in the medium term for water treatment and distribution (USD1.4billion), wastewater treatment (USD400million) and sewerage (USD700million). EMOS forecasts that it will need USD2billion over 20 years so as to ensure the development of its sewerage network and its sewage treatment system. Three sewage treatment works are to be constructed in the medium term, so as to link in with the city's sewerage network, as described below. Broadly speaking, Chile will need to spend USD5-6billion in order to develop a universal sewerage and sewage treatment service in the longer term.

### Capital spending in Chile, 2010-20 (USD million)

	2010	2011-15	2016-20
Water	90	290	180
Sewerage	50	200	140
Sewage treatment	50	40	10
Earthquake response	0	100	0

Source: SSIS, quoted in GWI, p24, August 2010

The government approved a bill in 2004 which will permit the granting of concessions for storm sewerage systems. MOP announced in 2006 that USD2.6billion was needed to complete Chile's rainwater management systems for cities with more than 50,000 people, with USD690million required in Santiago.

Aguas Andinas is implementing a USD477million investment plan by 2010 for completing its sewerage coverage programme, including USD197million for the construction of the Los Nogales wastewater treatment plant, which is scheduled to begin operations in 2010. Nationally, SISS

expected wastewater treatment to rise from 77.5% in 2005 to 81% in 2006. Longer term targets are 98.8% for 2010 and 99.4% for year 2015.

The privatisation/PSP process raised USD2.29billion with the state retaining 35.4% of the sector's equity. These stakes generate USD80million pa in dividends, USD54million of which provide subsidies for the poorest 17% of the population.

<b>Urban Data (2008)</b>	
With improved drinking water	99%
With household drinking water	99%
With improved sewerage	98%
With household sewerage (2004)	89%
With 2 <sup>0</sup> sewage treatment	72%

### Infrastructure spending, 1999-09

According to SISS, the 19 largest water and sewerage companies invested USD1.97billion in water infrastructure and USD1.55billion on sewerage and sewage treatment between 1999 and 2009. During this period, the number of water connections rose by 2.5%.

### CORFO considering further stake sales

CORFO, the Chilean state development agency is considering selling its outstanding stakes in Aguas Andinas, Essal, Essbio and Esval, all of which are asset owning companies.

<b>Freshwater</b>	
Annual availability (2007)	884km <sup>3</sup>
Per capita (2008)	52,607m <sup>3</sup>
Annual withdrawal (2007)	1%
Domestic (2007)	11%
Industrial (2007)	25%
Agriculture (2007)	64%

<b>Groundwater</b>	
Annual availability (1998)	140.0km <sup>3</sup>
Per capita	9,444m <sup>3</sup>

### Rainwater management and desalination are the next area for PSP

According to a study carried out the Chilean construction chamber's (CChC) specialists, investment in sanitation and rainwater management infrastructure during the 2006-10 period will total USD3.7billion, while the amount invested during the 2008-12 period should be at least USD4.5billion. The government has indicated that PSP will be used as a tool to finance and manage these investments.

MOP, the Ministry of Public Works is seeking to develop private sector desalination projects for mining companies operating in the north of the country. In 2009, Escondida was given the go-ahead to develop a USD3.5billion facility to serve its activities in Region II.

### Santiago and Chile's 12 Regions

Region	Contract Type	People served (2005)	Date of PSP	Average water consumption per client
I	BOT	411,586	2003	212.4 m <sup>3</sup> pa
II	BOT	461,333	2003	212.4 m <sup>3</sup> pa
III	BOT	231,357	2004	198.0 m <sup>3</sup> pa
IV	BOT	486,891	2003	180.0 m <sup>3</sup> pa
V	Privatised	1,372,910	1998	180.0 m <sup>3</sup> pa
Metropolitan	Privatised	4,934,120	1999	289.2 m <sup>3</sup> pa
VI	Privatised	With VIII	2000	With VIII
VII	BOT	571,047	2001	182.4 m <sup>3</sup> pa
VIII	Privatised	2,075,720	2000	205.2 m <sup>3</sup> pa
IX	BOT	535,317	2003	177.6 m <sup>3</sup> pa



X	Privatised	510,899	1999	190.8 m <sup>3</sup> pa
XI	BOT	69,719	2004	187.2 m <sup>3</sup> pa
XII	BOT	127,615	2003	228.0 m <sup>3</sup> pa

Region	Company	2004 Revenues USDmillion	Concession Company	Owners
I	ESSAT	31.5	Aguas de Altiplano	Grupo Solari
II	ESSAN	48.2	Aguas de Antofagasta	Grupo Luksic
III	EMSSAT	14.2	Aguas Chañar	Hidroscan / Icfal / Vecta
IV	ESSCO	29.2	Aguas de Valle	Vicuña / Fernández León
V	ESVAL	100.5	ESVAL	Grupo Hurtado
Metropolitan	EMOS	326.9	Aguas Andinas	Agbar
VI	ESSEL	See VIII	ESSBIO	Southern Cross
VII	ESSAM	28.7	Aguas Nuevo, Sur, Maule	Southern Cross
VIII	ESSBIO	111.1	ESSBIO	Southern Cross
IX	ESSAR	25.9	Aguas Araucania	Grupo Solari
X	ESSAL	38.1	ESSAL	Iberdrola
XI	EMSSA	5.8	Aguas Patagonia Aysen	Hidroscan / Icfal / Vecta
XII	ESSMAG	11.6	Aguas Magallanes	Grupo Solari

Source:

SSIS data, published in Santander Investment (2006) *IAM: Swimming in Safe Waters*, Santander, 9<sup>th</sup> March 2006, Santiago, Chile

MAJOR CITIES			
City	2005	2015	Status
Santiago	5,683,000	6,191,000	EMOS privatised in 1999

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
ESSAM	Nuevosur (Chile)	655,000	635,000	655,000
EMOS	Aguas Andinas (Chile)	5,800,000	5,700,000	5,800,000
ESVAL	ESVAL (Chile)	1,392,000	1,335,000	1,392,000
ESSCO	ESVAL (Chile)	510,000	490,000	510,000
ESSEL	Southern Cross (USA)	600,000	600,000	600,000
ESSBIO	Southern Cross (USA)	1,500,000	1,500,000	1,500,000
ESSAL	Aguas Andinas (Chile)	650,000	650,000	650,000
ESSAT	Aguas Nuevas (Chile)	480,000	460,000	480,000
ESSAR	Aguas Nuevas (Chile)	870,000	830,000	870,000
ESMAG	Aguas Nuevas (Chile)	150,000	145,000	150,000
ESSAN	Antofagasta (Chile / UK)	500,000	475,000	500,000
Cascal	Sembcorp (Singapore)	108,000	13,000	108,000
Bayesa	Sembcorp (Singapore)	0	282,000	282,000
Aguas Decima	Agbar (Spain)	120,000	90,000	120,000
Aguas Quinta	Agbar (Spain)	200,000	150,000	200,000
Aguas Cordillera	EMOS (Chile)	315,000	295,000	315,000

Sources:

World Bank & PPIAF (2006) *Approaches to Private Participation in Water Services: A Toolkit*, Appendix A. World Bank, Washington DC

Errazuriz P P (2010) 'Complete turnaround of Chilean water companies', Presentation to the GWI conference, Paris, February 2010

**CHINA**

<b>Economics (2008)</b>	
GNI per capita	USD2,940
GNI per capita (PPP)	USD6,010
Agriculture	11%
Industry	49%
Services	40%

**Legal Framework**

The State Council is responsible for official government policy and sets national priorities and objectives. The State Council's "*Circular on Strengthening Urban Water Supply, Water Saving and Water Pollution Prevention and Control (2000)*" sets the policy agenda for 2000–10, by (i) improving water supply planning and promoting water conservation; (ii) enforcing the "Law on Water Pollution Prevention and Control" by aiming for at least a 60% urban wastewater treatment rate by 2010; (iii) promoting market-oriented tariff reforms to help attract private capital; and (iv) improving sector governance and regulation. It's "*Decision on Reforming the Investment System (2004)*" aims to promote non-government investment in new areas of the economy, including municipal public utilities and encourages enterprises to raise capital through the debt and equity markets, while relaxing the government's review process for new investments.

The State Council's document 34, the "*Circular on accelerating the reform of water price, promoting water saving and protecting water resource (2004)*" defines four major components of water price for the first time: water resource tariff, water fee for hydro projects, charges for water supply and charges for wastewater treatment and emphasises the need to adjust the water supply price to a rational level.

In 2008, the Ministry of Environmental Protection was established. At the same time, the Law on Prevention and Control of Pollution was revised and implemented.

**The 2002 Water Resource Law**

This law has been in effect since 1<sup>st</sup> October 2002 and marks a significant tightening of the 1998 Water Resource Law, introducing a Department of Water Administration run by the State Council as an overall manager of water policy for the country. All water abstraction requires permission and a suitable consumption fee. The OECD notes that the Water Law "opens the way for integrated driver basin management, stakeholder participation and the use of market mechanisms in water management".

Formal tariff charging started in 1985. Water provision is subsidised in order to ensure its universal availability in urban areas. This applies both to piped water and water provided by vendors. The State Council's document 34, the "*Circular on accelerating the reform of water price, promoting water saving and protecting water resource (2004)*" emphasises the need to adjust the water supply price to a rational level, moving from an average tariff accounting for 0.5% of household expenditure up to 1.5% (Browder 2007).

The Government has passed 13 water laws since 1989, along with a framework water law in 1985 including: The Water Act (1988), The Management Stipulation of Urban Water Conservation (1989) and The Water Consumption Quota Measure (1989). The 11<sup>th</sup> five year plan (2006-10) seeks to mobilise RMB1trillion (USD143billion) for water and wastewater projects. Official targets are for water coverage in cities to be at least 95% in 2010, up from the current 91%.

The State Council's "Decision on Reforming the Investment System (2004)" aims to promote non-government investment in new areas of the economy, including municipal public utilities and encourages enterprises to raise capital through the debt and equity markets, while relaxing the government's review process for new investments. The 2002 Water Resource Law "opens the way for integrated driver basin management, stakeholder participation and the use of market mechanisms in water management".

### A diversion?

The South to North Water Diversion Project is designed to transfer water from the Yangtze River in the water rich south to the water poor north of the country. The disparity between population and water resources is such that 80% of water resources are in the Yangtze River Valley, compared with 54% of China's population and 35% of arable land. 44% of the population live to the north of the valley, but they only have 15% of water resources. The project was first proposed by Mao Zedong in 1952 and was due to be completed by 2010. Construction in fact started in 2002 and will continue into the mid 2030s, at a cost of at least USD60-65billion. More than 2,500km of canals will be built, in three separate projects.

The USD24billion Three Gorges Dam project being constructed along the Yangtze River demonstrates the challenges involved in projects of this scale. In 2004, more than 700million tonnes of sewage and industrial wastewater was discharged into the Yangtze River basin. The 660km reservoir system started holding water in 2004, and without suitable measures, will trap effluents from cities upstream. In 2004, the State Environmental Protection Administration (SEPA) assessed its Three Gorges Anti-Water Pollution Plan. To date, 93% of industries have yet to achieve zero emissions or emission recycling, against an aim of reducing industrial pollution in the Three Gorges Reservoir by 30% by 2005. Indeed, 35% of projects had yet to start and 75% of facilities continue to discharge effluents at their pre-plan levels. 320 wastewater treatment works are due to be built by 2010 at a cost of RMB40billion (USD5billion), but this will only cover 85% of effluents discharged and further investment will be needed for sewerage systems.

### Water and sewerage development

	1980	1993
Piped water (billion m <sup>3</sup> /pa)	8.83	45.02
Domestic (billion m <sup>3</sup> /pa)	3.39	12.83
Access to piped water	81.4%	93.1%
Sewage removal (t/pa)	16.43	31.68
Sewer pipes (km/1000)	0.24	0.45

### Tariffs, cost recovery and tariff reform

Water provision has been subsidised in order to ensure its universal availability in urban areas, with formal tariff charging only starting in 1985. Currently, water tariffs account for 0.5% of household expenditure and there is no effective constraint upon its consumption. In 2004 the ministry of water resources estimated that China's economy is 85% below the global efficiency average in water consumption. This is in part due to outdated plant and management techniques, but mainly as a result of artificially low water fees.

### Profitability of municipal water utilities

1997 (531 cities)		2004 (661 cities)		
Profits	Average for all	Category I	Category II	Category III
>10%	10%	0%	7%	4%
0% - 10%	48%	38%	41%	32%
0% - -10%	16%	33%	18%	26%
> -10%	23%	29%	33%	38%

High capital spending since 1997 and the cost of servicing new debt have eroded the general profitability of these services. Indeed, these services are currently making a loss in a majority of cities. This is only partly accounted for by factors such as tariffs. It is evident that if bills are not paid, this erodes revenues and profits as do excessive management, staffing and operating costs.

### Water tariffs and tariff reform

Until recently, water tariffs did not reflect their actual costs. This is in the process of altering due to a number of drivers that have emerged in recent years. All domestic urban water users are metered, either directly through household or apartment connections or through a meter serving their entire

apartment block. The table below summarises water tariffs by city category and tariff changes over the past decade.

### Weighted average water supply tariffs by category of city (RMB/m<sup>3</sup>)

City	1997	2004	Change
Category I	1.00	1.72	72%
Category II	0.93	1.33	43%
Category III	0.85	1.24	46%
National average	0.93	1.37	47%

According to the National Development and Reform Commission, average tariffs in the 36 large and medium sized cities rose by 10% during 2005 to RMB2.09 per m<sup>3</sup> including RMB1.55 per m<sup>3</sup> for water and RMB0.54 per m<sup>3</sup> for wastewater.

The water industry generates revenues of RMB60-70billion pa, which is anticipated to rise to RMB150-200billion by 2010 as tariff reform drives tariffs to RMB6.00 per m<sup>3</sup>.

### Tariffs in 2005

RMB per m <sup>3</sup>	Conventional water		Reclaimed water	
	Domestic	Industrial	Domestic	Industrial
Beijing	3.7	5.6	1.0	1.0
Tianjin (central)	2.9	4.6	1.1	1.3

Population	
Total 2009 (million)	1,345.8
Total 2020 (million)	1,423.9
Urbanisation in 2008	43.1%
Urbanisation by 2020	53.2%
Urbanisation by 2050	72.9%

### Urban water in China

The table below highlights the effect of increased tariffs on domestic water usage, whereby despite an increase in domestic users from 273million in 2002 to 322million in 2006, the volume of domestic water supplied increased from 15.0billion m<sup>3</sup> to 15.9billion m<sup>3</sup>.

### Urban water usage in China, 2002-06

Billion m <sup>3</sup> pa	2002	2003	2004	2005	2006
Industry	20.9	20.9	21.1	21.0	22.2
Public services	6.2	6.8	6.8	7.1	6.4
Domestic supply	15.0	16.4	16.5	17.3	15.9
<b>Total</b>	46.6	48.4	48.9	50.1	54.1
Consumption (l/day)	213	215	212	204	190
Users (million)	273	295	303	327	322

Urban Data (2008)	
With improved drinking water	98%
With household drinking water	96%
With improved sewerage	58%
With household sewerage (2004)	50%
With 20 sewage treatment	26%

### Water quality and quantity

In 2004 the Ministry of Water Resources estimated that China's economy is 85% below the global efficiency average in water consumption. This is in part due to outdated plant and management techniques, but mainly as a result of artificially low water fees. The Ministry of Construction and the Beijing municipality, acting under the authority of the State Council, have issued rules aimed at rationalising water tariffs to encourage efficiency.

Currently, over 400 of the leading 600 Chinese cities are short of water, with Beijing and Tianjin, the national capital and a major port city in the north, at a critical moment of water shortage. Meanwhile, rural people in some arid areas also have to endure acute water shortage, either for farming or drinking.

China discharged 43-50 billion m<sup>3</sup> of wastewater in 2000-2001 (various estimates), including 20 billion m<sup>3</sup> of industrial wastewater. The annual increase in effluent discharge estimated at 2.4 billion m<sup>3</sup> pa in 1999. Total discharge in 2008 was 57.2 billion tonnes, compared with 53.7 billion tonnes and 55.7 billion tonnes in 2006 and 2007 respectively. While industrial discharge was stable at 24.2 billion tonnes, domestic discharges rose through the period from 29.7 billion tonnes to 33.0 billion tonnes.

63% of rivers tested in 1998 were at or below class four (bad to very bad, equivalent to abiotic) on China's five-tiered water-quality scale. In 2008, 24.2% were class four or five and 20.8% below class five. That year 39.3% of major reservoirs and lakes were of class four and five and 39.3% were below class five. 90% of urban water sources are also polluted. In 1997, China spent 1% of its national budget on environmental protection. Water shortages in cities cause a loss of an estimated USD11.2 billion (RMB120 billion) in industrial output, while the impact of water pollution on human health has been valued at USD3.9 billion (RMB41.73 billion).

At the end of 2000 (9th Five Year Plan) there were 427 WWTWs in China, including 282 to secondary standard, with a total treatment capacity of 14.75 million m<sup>3</sup> per day. USD3.6 billion was spent on building 317 municipal Wastewater Treatment Works ('WWTWs') in 1998-2002, via internal treasury bonds. At the end of 2002, there were 452 WWTWs in operation, with a capacity of 31 million m<sup>3</sup> per day. China recycled 40% of its urban wastewater, compared with 75-80% in developed economies. Treatment capacity was expected to exceed 30 million m<sup>3</sup> per day by the end of the 10th Five Year Plan in 2005. In addition, USD2.6 billion will be spent cleaning up Beijing's water system.

Since 2001, all 699 cities and urban areas with a population of more than 500,000 are meant to develop appropriate sewage treatment facilities for 60% of effluents by the end of the 10th Five Year Plan (2001-2005). All cities are meant to charge a sewage treatment levy by the end of 2003. Shanghai, Jiangsu and Zhejiang and the other main industrialised cities will have 50% of facilities at a cost of USD9 billion, treating 22 million m<sup>3</sup> of effluent per day. In June 2003, the State Environmental Protection Administration (SEPA) announced that China's treatment capacity will double from 25 million m<sup>3</sup> pa to 58 million m<sup>3</sup> pa by 2005, with an investment of USD14.5 billion. In total, USD36 billion is to be spent between 2000 and 2010 on WWTWs. In 2001-2005 (10th Five Year Plan), 375 WWTWs were to be built.

In rural areas, 500 million people have access to tap water, with 106 million having improved sanitation facilities. The country's rural areas have seen 674,000 waterworks built along with 48.91 million wells. By the end of 2000, 880 million Chinese rural residents, or 92.4% of the country's rural population, had improved water services, with 106 million rural dwellers having modern toilets, taking the incidence of such toilets in rural areas to 44.8%. However, WHO estimates for 2000 point to 66% and 27% coverage respectively.

### Municipal water services in China

China's municipal water services (the services provided in urban areas) can be characterised as having a notably high connection density (people served per km of water mains), a high metering penetration, but a low proportion of water used being provided by the utilities (46% against 68-80% in Brazil, Russia and the UK) and a poor payment collection rate (Source: WB, 2007, p12).

**Service development and city size**

Category		Number	Population (million)	Water Supply coverage (%)	Wastewater treatment (%)
I	Population > 2million GNP/Cap >USD3,000	21	90	93%	61%
II	Population 0.5-2.0million GNP/Cap USD1,500-3,000	331	201	91%	38%
III	Population < 0.5million GNP/Cap <USD1,500	310	58	86%	21%

Municipal wastewater treatment has increased from 15% in 1990 to 52% by 2005 with a 65% target by 2010. In an interview in GWI (September 2009, p26) the General Manager of Beijing Drainage notes that there were 37 wastewater treatment plants in China in 1978 (2 in Beijing), with 300 by 1997 and 800 by 2004, rising to 1,500 (30 in Beijing) in 2008. In the long term, he projects a further 4,000 being built.

<b>Freshwater</b>	
Annual availability (2007)	2,124km <sup>3</sup>
Per capita (2008)	2,812 m <sup>3</sup>
Annual withdrawal (2007)	22%
Domestic (2007)	7%
Industrial (2007)	26%
Agriculture (2007)	67%

**Estimates of Chinese urban sewerage treatment capacity and technology/equipment market:**

	1996-2000	2110-2005	2006-2010	2011-2015
Treatment rate (%)	10.8	22	35	50
Treatment capacity (m tons/day)	10.4	22.2	38.7	60.3
Current capacity (m tons/day)	N/A	10.4	22.2	38.7
Construction required (m tons/day)	N/A	11.8	16.5	21.6
Investment for construction (billionRMB)	9.0	14.1-17.6	19.8-24.7	25.8-32.3
Yearly operation cost (billionRMB)	1.6-2.5	3.3-5.3	5.8-9.9	9.0-14.5
Technology / equipment market size (billionRMB)	N/A	4.9-7.9	6.9-11.1	9.1-14.6

Source: China Environmental Protection Industry Association 2001

**Total forecast spending on environmental protection:**

9th five year plan, 1996	2000	USD43billion
10th five year plan, 2001	2005	USD84billion
11th five year plan, 2006	2010	USD157billion
12th five year plan, 2011	2015	In preparation

In fact, USD224billion is being spent during the 11th Plan, much part of the difference being accounted for by *currency* changes. It is understood that the 12th Five Year Plan will seek to increase urban sewage treatment to at least 60% and preferably to 70-80%. It will also need to address water scarcity issues in tandem with further urbanisation and industrial development. Details will not be revealed before the end of 2010, but spending is anticipated to be double the 11th Plan levels.

China earmarked USD33billion of the Five Year Plan's spending on water and wastewater treatment projects between 2001 and 2005. Under the 10th Five Year Plan, 11% of funding is earmarked from central government, 34% from local and provincial government and 55% from industry. But by the end of 2002, just 28% of the plan had been realised and 70% of planned total was realised by the end of 2005.

It is understood that the 2006-11 period seeks to mobilise RMB1trillion (USD125billion) for water and wastewater projects. This includes RMB330billion on sewage treatment projects for the 278 cities that currently do not have them and RMB320billion for the two main pipelines for the South-North Water Transfer Project. Official targets are for water coverage in cities to be at least 95% in 2010, up from the current 91% and around 70% of wastewater, 28billion m<sup>3</sup> pa will be treated.

### Planning and paying for water and wastewater infrastructure

Because water provision is officially regarded as a commercial activity, it is not accounted for on the 11th Five-Year Plan (WB, 2007, p34), but as the World Bank points out, where the private sector is not involved and tariffs do not cover costs, significant state and municipal funds will still be required. In contrast, detailed forecasts for investments in wastewater services have been prepared.

### Wastewater investments in the 11th Five-Year Plan

Area	RMBbillion	%
Water reuse	9	3%
Rehabilitation	11	4%
Sludge	43	14%
Wastewater treatment plants	49	16%
Sewerage network	188	63%

### World Bank estimates of water and wastewater spending in China:

RMBbillion	8th – 10th Five Year Plans	11th Five-Year Plan
	1991-05	2006-10
Water Supply	200	160
Wastewater	230	270
Total	400	430

This represents a more than tripling of the rate of expenditure seen in the previous fifteen years. Further significant spending can be expected in the future as urbanisation continues, along with the impact of continued economic development and the broader adoption of water intensive domestic goods.

Global Water Intelligence estimates that operating spending on municipal water services will rise from USD4.65bn in 2007 to USD10.88billion by 2016, with operating spending on municipal wastewater services rising from USD4.20bn to USD5.95bn during that period.

### PSP and politics

Private sector participation in water and wastewater services in China has been enabled by legislation such as the 1984 PRC Water Pollution Prevention Law and the 1988 PRC Water Law and subsequently by various laws governing such aspects as Contract Law (1999).

The Ministry of Construction's 2000 "*Circular on Accelerating the Marketization of Urban Utilities*" encourages domestic and foreign investment in urban public utilities through a variety of ownership arrangements such as sole ownership, joint ventures, or partnerships. The joint "*Circular on Accelerating the Commercialization of Urban Wastewater and Solid Waste Treatment*" by the MOC, the National Development Reform Commission and the State Environmental Protection Agency in September 2002 provided specific references to wastewater treatment plants and promotes arrangements such as build-operate transfer (BOT), joint ventures with municipal utilities, and transfer-own transfer (TOT) contracts.

The Chinese Government formally opened the national urban utility market to domestic and overseas investors in 2003. Domestic and foreign investors would be allowed to invest alone or cooperate with local authorities or enterprises. The Ministry would further promote charges for sewage and refuse treatment in 2003, and deepen the price reform of water supply, so as to establish a price system adapted to the market economy.

The Ministry of Construction's 2004 "*The Administrative Method of Urban Utilities Concessions*" was meant to fully establish the legal status of concession contracts, but may need to be further developed regarding the legal status of contracts, the imbalance between the enterprise and the government and the limitation of its applicability.

Water provision is subsidised in order to ensure its universal availability in urban areas. This applies both to piped water and water provided by vendors. The supply of water has deteriorated both in terms of availability and the quality of the water provided because of the lack of funding. On average, water accounts for 0.5% of household expenditure. In consequence, domestic water use in urban China is at an appreciably higher level than is currently sustainable. There have been a number of developments at the municipal level designed to eliminate subsidies, while ensuring that water services are both of a higher quality and affordable (up to 1.5% of average household expenditure).

At the end of 1999, Chinese and expatriate companies served 11million people against 15million being served by international players. More recently, water and sewerage PSP has moved forward at a dramatic rate. Since 2000, contracts serving a further 21million people have been awarded to international companies, while contracts serving 36million people have been awarded to Chinese and expatriate companies.

International companies seeking to enter this market need official support from at least one of the main Beijing government bodies. The State Planning Commission (SPC) approves BOT projects. The Ministry of Construction (MOC) approves STW construction and operation projects inside cities, having been involved with the private sector since 1993 with the water and sewerage sectors. The Ministry of Water Resources (MWR) is responsible for non-urban areas. While the MWR is still responsible for major infrastructure projects, it is much less powerful than the MOC, and therefore the MWR is not seen as important when seeking international BOT proposals. The State Environmental Protection Administration (SEPA, formed in 1998) looks after STWs and industrial effluent treatment projects. The NEPA works with provincial EPAs, which are essential partners for sewerage and sewage treatment BOT projects. To date, all such projects have in fact remained in state hands, whilst mobilising finance from international multilateral agencies.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	870.00
Per capita (1998, m <sup>3</sup> )	693
Withdrawals (1985, km <sup>3</sup> )	75.0
For agriculture (1985)	54%

### **Chinese private sector players**

Three broad approaches are being used by the private sector in China. Firstly, include international companies working with joint ventures or through specialist funds. Joint ventures Sino-French Holdings (Suez and New World), and the leading dedicated fund is the China Water Company, which is held by Sembcorp (Singapore). The setting up of Chinese owned private sector companies, i.e. the partly owned by the state and private companies owned by regional players mainly in Singapore and Malaysia. Restrictions on returns by foreign owned and controlled entities have meant that stakes in ventures such as Thames Water's Shanghai water treatment project have been sold back.

Secondly, a major expatriate Chinese market has developed. To date this has mainly come from 'expatriates' in Hong Kong and from Malaysia and Singapore. The development of this market outside Hong Kong has taken place since 2000.

The largest market in terms of recent developments is that of nationally based Chinese companies. These can either work on their own or in partnership with international companies. To date six examples of the third approach have been identified. One, Shenzhen Overseas Chinese Town Co is indirectly concerned with the sector, concentrating on the development of tourist facilities for Shenzhen, including water services. The Suzhou New District Hi-Tech Industrial Co Ltd carried out the development and operation of water, road, gas and power services for the city's Hi-Tech Industrial Development Zone. Shenyang Public Utility is responsible for most of Shenyang's water provision. Three others (Shanghai Lingqiao Tap Water Co, Shanghai Municipal Raw Water and Wuhan Sanzheng Industry Co Ltd) are primarily concerned with water provision projects and services. In all cases, a majority of the company's shares continue to be directly or indirectly in state or municipal hands.



By the end of July 2004, contracts covering 31million people have been awarded to Chinese companies, along with 16million through expatriate Chinese companies. International companies serve 36million, in all cases through joint ventures. However, at the end of 1999, Chinese and expatriate companies served 11million against 15million being served by international players. Thus while Chinese and expatriate companies have privatised services affecting 36million more people since 2000, international players have moved more modestly ahead with 21million people.

## Companies noted

Water treatment facilities constructed by Degrémont (Suez) and Purac (now operating as Enpure) in China serve 100million and 40million people respectively. These companies have been active in the market since the 1970s and effectively pioneered the return of western engineering concerns to the country.

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Anshan	1,611,000	1,864,000	PSP (Dalian Dongda)
Anshun	822,000	922,000	N/A
Baotou	1,920,000	2,473,000	PSP (Epure)
Beijing	10,717,000	12,850,000	Various projects
Benxi	1,000,000	1,144,000	N/A
Changchun	3,046,000	3,765,000	Wastewater BOT
Chengde	1,429,000	1,700,000	N/A
Changsha	2,451,000	3,169,000	Wastewater TOT
Chengdu	4,065,000	4,637,000	VE has a water treatment & provision BOT
Changzhou	1,249,000	1,623,000	Water management JV
Chifeng	1,238,000	1,490,000	N/A
Chongqing	6,363,000	7,258,000	Chongqing Water / Suez Environnement
Dailan	3,073,000	3,664,000	Water treatment BOT
Daqing	1,594,000	2,067,000	Water treatment BOT
Datong	1,763,000	2,285,000	N/A
Dongguan	4,320,000	5,370,000	Bulk water concession
Fushun	1,456,000	1,653,000	N/A
Fuxin	807,000	866,000	N/A
Fuyu	1,068,000	1,244,000	N/A
Fuzhou	2,453,000	3,172,000	PSP (China Water Co)
Guangzhou	8,425,000	10,420,000	Various water and WW contracts
Guiyang	3,447,000	4,446,000	N/A
Handan	1,535,000	1,992,000	Wastewater BOT
Hangzhou	2,831,000	3,656,000	Wastewater BOT
Harbin	3,695,000	4,392,000	Water treatment BOT
Hefei	1,916,000	2,481,000	Two PSP projects
Henyang	973,000	1,211,000	N/A
Heze	1,318,000	1,519,000	Beijing Enterprises Water
Huaian	1,243,000	1,441,000	Beijing Capital
Huaianan	1,420,000	1,664,000	One water treatment JV
Huhehaote	998,000	1,057,000	Water management project
Hunjiang	798,000	925,000	N/A
Huzhou	1,203,000	1,417,000	Two PSP projects
Jiamusi	969,000	1,230,000	N/A
Jiaying	954,000	1,160,000	N/A
Jilin	2,255,000	2,918,000	N/A
Jingmen	1,228,000	1,403,000	Two water and one WWTW BOT
Jinan	2,743,000	3,184,000	Seven water BOTs
Jining	1,143,000	1,397,000	N/A
Jinzhou	925,000	1,118,000	Water & WW TOTs
Jinxi	2,268,000	2,988,000	N/A
Jixi	947,000	1,106,000	N/A
Kaifeng	848,000	1,015,000	N/A

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Kunming	2,837,000	3,406,000	Water treatment BOT
Lanzhou	2,788,000	1,938,000	Veolia Environnement
Leshan	1,411,000	3,117,000	N/A
Linqing	1,009,000	1,288,000	N/A
Linyi	2,035,000	2,387,000	Water & WW BOTs
Liuan	1,647,000	1,948,000	N/A
Liupanshui	1,149,000	1,149,000	N/A
Liuzhou	1,409,000	1,829,000	Two wastewater treatment plants
Louyang	1,664,000	2,031,000	N/A
Mianyang	1,322,000	1,689,000	Wastewater TOT
Mudanjiang	1,171,000	1,522,000	N/A
Nanchang	2,188,000	2,913,000	Four water & WW contracts
Nanchong	2,046,000	2,649,000	One bulk water BOT
Nanjing	3,621,000	4,151,000	Three wastewater BOTs
Nanning	2,040,000	2,641,000	N/A
Neijiang	1,441,000	1,670,000	N/A
Ningbo	1,810,000	2,345,000	N/A
Pingxiang	905,000	1,178,000	N/A
Qingdao	2,817,000	3,248,000	Four water & wastewater BOTs
Qiqihar	1,607,000	1,877,000	Wastewater BOT
Shanghai	14,503,000	17,225,000	A wide range of contracts & companies
Shantou	1,495,000	1,980,000	N/A
Shenyang	4,720,000	5,377,000	Shenyang Public Utility floated in 1999
Shenzhen	7,233,000	8,958,000	Bulk water PSP, W & WW BOT
Shijiazhuang	2,275,000	2,943,000	UNDP commercialisation project under way
Suining	1,401,000	1,621,000	N/A
Suqian	1,258,000	1,422,000	One WWTW BOT
Suzhou	1,849,000	2,396,000	PSP for industrial development zone
Taian	1,598,000	1,858,000	N/A
Taichung	1,033,000	1,281,000	N/A
Taiyuan	2,794,000	2,863,000	One wastewater BOT
Tangshan	1,825,000	2,176,000	Water O&M
Tianjin	7,040,000	8,119,000	Various major projects
Tianmen	1,676,000	1,946,000	Water BOT
Tianshui	1,199,000	1,946,000	N/A
Tongliao	855,000	1,036,000	N/A
Wanxian	1,963,000	2,438,000	N/A
Weifang	1,498,000	1,822,000	WWTW BOT
Wenzhou	2,212,000	2,862,000	Water treatment BOT
Wuhan	7,093,000	8,204,000	Wuhan Sanzheng Industry Holding
Urumqi	1,562,000	1,905,000	Various projects
Wuxi	1,646,000	2,135,000	Two WWTW BOTs
Xian	3,926,000	4,559,000	One water treatment and two WW BOTs
Xiangxiang	863,000	1,081,000	N/A
Xiantao	1,528,000	1,772,000	N/A
Xianyang	1,072,000	1,355,000	Two water BOTs
Xiaoshan	1,130,000	1,164,000	N/A
Xinghua	1,587,000	1,677,000	One water BOT
Xintai	1,334,000	1,378,000	One WWTW BOT
Xinyu	870,000	1,096,000	Three water contracts
Xuanzhou	851,000	987,000	N/A
Xuzhou	1,960,000	2,566,000	Four BOTs
Yangchen	789,000	1,029,000	Two BOTs
Yantai	1,991,000	2,578,000	N/A
Yichun (H'ang)	785,000	849,000	N/A
Yichun (Jiangxi)	961,000	1,127,000	Water treatment and WWTW BOTs
Yixing	1,129,000	1,195,000	N/A
Yiyang	1,313,000	1,572,000	PSP currently under consideration

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Yonzhou	991,000	1,128,000	Four wastewater BOTs
Yueyang	847,000	880,000	One water BOT
Yulin	1,060,000	1,379,000	N/A
Yuyao	876,000	950,000	One wastewater BOT
Yuzhou	1,226,000	1,357,000	PSP WWTW project being tendered for
Zaoyang	1,210,000	1,418,000	N/A
Zaozhuang	2,096,000	2,458,000	N/A
Zhangilakou	1,001,000	1,248,000	N/A
Zhangjiangang	936,000	1,056,000	N/A
Zhanjiang	1,514,000	1,905,000	One water BOT
Zhaodong	783,000	948,000	One wastewater BOT
Zhengzhou	2,590,000	2,989,000	Bulk water BOT
Zibo	2,982,000	3,517,000	Four WW BOTs - China Everbright JV
Zigong	1,087,000	1,260,000	One WWTW BOT

The 109 cities forecast in 2003 to have a population in excess of 1million by 2015 is a significant increase on the number in the 1996 UN urbanisation assessment. This in turn rose to 114 in the 2007 assessment. This is due to better data as well as major cities such as Shenyang fragmenting into several autonomous entities. It is also of interest to note that there has been some scaling back of the 2015 population forecasts since the 2001 edition of the *Masons Water Year Book*.

### City Study: Shanghai

The Shanghai Water Resources Bureau operates the city's water and sewerage services. All of the urban area's 7,496,500 people are supplied with piped water via 1,499,300 connections, using an average of 193L of water per day. All connections are metered, with the quality of water generally being regarded as low although water treatment works nominally account for 104% of water demand. There is no surcharge for sewerage services. Water costs USD0.13 per m<sup>3</sup>, with no price adjustment made for the volume used. Shanghai's main challenges are developing its infrastructure for continued growth, industrialisation and water pollution.

Greater Shanghai saw the construction of 31 WWTWs between 1980 and 2002 at a cost of RMB10billion, treating 44% of the 5.40million m<sup>3</sup> of effluents generated each day. There are plans for 27 more, including 14 between 2001 and 2006, with two major works in construction. The Zhuyuan Wastewater Treatment Plant with a capacity of 1.70million m<sup>3</sup> per day is being constructed and operated (20 years) by Youlian Enterprise Development Company and two other private players. RMB0.87billion is to be invested in the project, which started in 2002. The contract is for the operation of the Shanghai Zhuyuan No 1 Sewage Treatment Factory. YEDC, along with two other private companies, will invest CNY870million (EUR107million), raising its capacity to 1.7million tonnes per day during the contract period. The Bailonggang Wastewater Treatment Plant will handle 1.2million m<sup>3</sup> per day at a cost of RMB060billion. Both were expected to be in service by the end of 2003.

In 1995, a consortium led by Thames Water and Bovis (P&O) was awarded a 20 year BOT contract to build and manage a water treatment plant at Da Chang, generating 0.4m m<sup>3</sup> of potable water per day. In 2002, the State Council issued a note requiring all fixed return water contracts held by foreign entities to be restructured. Thames Water subsequently sold its stake in the venture back to the municipality.

A second water treatment plant is currently being upgraded by Degrémont, on a stand-alone basis. In addition, Shanghai has two semi-private water companies. The Shanghai Lingqiao Tap Water Co. distributes water to the Pudong district of the city of Shanghai. The Shanghai Municipal Raw Water Co Ltd abstracts water from the Yangtze and Huangpu rivers for treatment at the Shanghai municipality's water treatment stations. The company builds and operates the pumping stations, canals and reservoirs necessary for the bulk water provision to the city.

### Shanghai – Guaranteed returns are not guaranteed

In 1995, a consortium led by Thames Water and Bovis (both of the UK) were awarded a 20 year BOT contract to build and manage a water treatment plant at Da Chang in Shanghai, generating 0.4million

m<sup>3</sup> of potable water per day. The facility provides drinking water for 2million people, having entered service at the end of 1997. The USD70million construction project was operated on a 50:50 basis and called Bovis Thames (Shanghai). In early 2002, Thames Water bought out its joint venture partner.

In 2002, the State Council passed a law requiring all fixed return water contracts held by foreign entities to be restructured. In the case of Bovis Thames (Shanghai), the contract was based around a 12% guaranteed return. Guaranteed returns are still allowed for Chinese companies. Thames Water subsequently sold its stake in the venture back to the municipality. It is understood that Thames Water made a nominal profit on the share sale.

### City Study: Beijing (Peking)

The Beijing Municipal Water Works Co. and the Beijing Water Resources Bureau operate water and sewerage services. The city's population of 5,769,600 has 1,153,920 connections, with 95% of the population receiving piped water. The average water consumption is 149L per capita per day. Water quality is regarded as poor, partly because of the contamination of the groundwater resources that supply 69% of current needs. In 1991, water prices were increased from 0.25CNY per m<sup>3</sup> to 0.45CNY per m<sup>3</sup> for industrial and commercial customers and from 0.12CNY per m<sup>3</sup> to 0.30CNY per m<sup>3</sup> for domestic customers. There are a total of 194,000 water meters, 175,000 for domestic customers and 14,000 for industrial and commercial customers. Distribution losses are officially estimated at 7.5% although in reality they are approximately 28%.

Year	1993	1996	2000
Capacity (million m <sup>3</sup> per day)	1.90	2.30	3.00
Demand (million m <sup>3</sup> per day)	1.95	2.50	3.10

In Beijing, 60% of the city was served by sewers in 1993, with the other 40% served by night soil carriers. In 1991, 3.6% of the city's sewage was treated in 1991, which increased to 18.5% in 1992. Officially, six WWTWs currently handle 50% of the city's effluents. By 2008, 87% of Beijing's sewage was being treated and the Beijing No 10 project will further increase this. The emphasis has now switched to reclaiming water from the treated effluent.

In the Greater Beijing area, the total abstraction was 3,564million m<sup>3</sup> pa in 1992, and is forecast to rise to 3,800million m<sup>3</sup> pa in 2000 and 5,140million m<sup>3</sup> by 2020. Groundwater is heavily used for agriculture (1,447million m<sup>3</sup> pa) and it is estimated that groundwater over-abstraction is currently running at 2,000–2,700million m<sup>3</sup> pa. Because water is scarce across Northern China, there is little scope for increasing the use of the Miyun and Guanting rivers, which flow in the region. The total water availability is currently at 400m<sup>3</sup> per capita pa. Water demand was expected to outstrip supply by 70% during 1991-2000. As a consequence, in November 1992, fees for water supply were fixed to usage, along with quotas for water usage. The current emphasis is to boost water supplies via upgrading and expanding the Number 9 Water Treatment Plant. The municipality is playing off various sources of funding for this project. In addition, World Bank funding is being sought for upgrading the Gao Bei Dian Treatment facility. The Beijing Number 10 treatment plant project, originally awarded to AWG and subsequently to Beijing Enterprise Water, is under construction at a cost of CNY1.5 billion and will cover 15% of the city by the time it enters service.

In June 2001 a RMB22billion (USD2.6billion) plan was started to ease water shortages in the capital city within five years. It involves 20 projects for water resource development, pollution protection, rain and flood water utilisation, building of water-saving and ecological agricultural developments around the reservoir areas and water quality monitoring. In total, Beijing spent USD12billion in the run up to the 2008 Olympics to improve its environmental performance. This includes an increase in sewage treatment from 45% in 2000 to 90% by 2007, with treatment capacity rising from 1.26million tonnes per day to 2.62million tonnes per day through USD870million being spent on seven large plants, and USD750million on 15 smaller facilities. Prior to the construction of four facilities in the past few years, there was effectively no sewage treatment in the city.

Beijing Drainage, the state held wastewater treatment and recovery utility estimates that 60% of Beijing's wastewater was recovered for reuse in 2009 and that they aim for 100% recovery by 2013 (interview in GWI, September 2009, p26) in a RMB35billion plan taking reuse from 860,000 m<sup>3</sup>/ day to 2,520,000 m<sup>3</sup>/ day (GWI, April 2009, p30).

**PSP contracts noted**

The list below is not comprehensive. The author's database contains details of approximately 460 contracts and the GWI China database (to the end of 2009) contains 854 contracts.

**City Study: Guangzhou (Canton)**

The Guangzhou Water Resources Bureau serves 92% of the central area's 2,914,300 people through 728,575 connections. All water connections are metered. Of the city's sewage 10% was treated in 1998, against an official target of 25%. In consequence, 2.7million tonnes of untreated effluent is discharged into the Pearl River daily and the local authority regards the river as biologically dead. A 7% 'Environment Tax' is levied in hotels, but there is no indication of how these funds are used. In 2002 Earth Tech was awarded a USD120million DBO contract that over two phases will treat 0.4million m<sup>3</sup> of wastewater per day, or 15% of the current total discharge.

**Universal service provision in Macao**

In contrast to Hong Kong, where water management and provision remains under municipal control, the former Portuguese colony of Macao had two PSPs for its water and sewerage services between 1985 and 1993. In 1996, the colony renewed the 1988 water provision concession for the Macao Water Supply Company (SAAM), for a further 25 years. The contract serves some 600,000 people via 169,460 domestic customer connections. This was awarded to Sino-French Holdings, the joint venture between Suez (France) and New World Infrastructure (Hong Kong) who holds 85% of SAAM's equity.

Since 1982, non revenue water in Macau has fallen from 40% to 11% by 2005 while rising from 27% to 37% in Hong Kong. While water prices as charged in Hong Kong and Macau are level pegging at HKD4.2 per m<sup>3</sup> (USD0.54), since 1997 (MOP 4.39 / m<sup>3</sup> for Macau since 1999, USD0.55), the actual cost of water services in Hong Kong are HKD11.0 per m<sup>3</sup> (USD1.41) resulting in Hong Kong's services making a loss compared with SAAM's 28% return on equity in 2004.

The water network has been extended from 127km in 1985 to 526km by 2005, with 90% of the original network having been replaced and the rest refurbished. The number of metered connections also increased from 61,000 to 192,843, including 23,363 commercial, industrial and government accounts.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
11 cities	25 year BOT, sewage treatment	Sound Global
4 cities	25 year BOT, water treatment	China Water Company
4 cities	Water treatment plant BOTs	Cathay International Water
Anyang	25 year BOT, sewage treatment	Beijing Capital Co
Baoding	20 year O&M, water provision	Sino French Holdings
Baoji	23 year bulk water BOT	VE / Beijing Capital Corp
Baoji	Wastewater treatment	China Water Industry
Baoying	26 year wastewater BOT	Tianjin Environmental
Beijing	23 year BOT, water treatment	Beijing Anling
Beijing	Industrial water & wastewater treatment	Shenfei Dayen
Beijing	29 year wastewater TOT	Bio-Treat Technologies
Beijing	20 year sewage treatment BOT	Kerry Utilities / VE
Beijing	Wastewater treatment BOT	VE
Beijing	Wastewater treatment BOT	Beijing Capital Co
Bengbu	30 year water supply BOT	SIHL
Bijie	Water treatment & mains BOT	Han's Technologies
Binzhou	40 year water BOT	Beijing Enterprises Water

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Binzhou	25 year wastewater BOT	Bio-Treat Technologies
Boluo	Wastewater treatment	China Water Industry
Boxing County	30 years, wastewater TOT	China Everbright
Central Wenzhou	Wastewater BOT	SIHL
Changle	Water management	VE
Changle	Water, bulk water & WW activities	Salcon Water
Changli	30 year water and sewerage contract	Sino French Holdings
Changping	29 year water BOT	Beijing Enterprises Water
Changsha	20 year wastewater TOT	Beijing Enterprises Water
Changtu	30 year O&M, water provision	Sino French Holdings
Changzhou	30 year water BOT	VE
Chengdu	18 year BOT, water provision	VE / Marubeni
Chengdu	25 year wastewater TOT	Beijing Enterprises Water
Chengdong	30 year water BOT	Salcon Water
Chongqing	40 year BOT, water provision	Sino French Holdings
Chongqing	30 year build & manage, water provision	Sino French Holdings
Chongqing	25 year BOT, wastewater treatment	Aquamundo
Chongqing	25 year BOT, wastewater treatment	Sino French Holdings
Da-fang	Water treatment & mains BOT	Han's Technologies
Danyang City	30 year wastewater treatment BOT	AEH
Dao Bin Shan	23 year water treatment BOT	Shenfei Dayen
Daya Bay	Water treatment	China Water Affairs
Daya Bay	Wastewater treatment	China Water Affairs
Deqing	15 year BOT, water treatment	Sound Global
Dongying	30 year BOO WW	Beijing Capital Co
Donnguan	Bulk water concession	GDI
Du Yun City	Water treatment	China Water Industry
Eastern Wenzhou	27 year wastewater BOT	SIHL
Fenyi	Water treatment	China Water Affairs
Fenyi	Wastewater treatment	China Water Affairs
Foshan	25 year BOT, wastewater treatment	Aquamundo
Foshan	23 year wastewater BOT	Bio-Treat Technologies
Foshan	22 year wastewater BOT	Beijing Enterprises Water
Fugou	Water treatment	China Water Affairs
Fuyang	30 year wastewater licence	Tianjin Environmental
Fuzhou	30 year water treatment concession	China Water Company
Gaoan	Water treatment	China Water Affairs
Gaoan	Water treatment	China Water Affairs
Gaozhou	30 year O&M, water provision	Sino French Holdings
Geermu	Water treatment	China Water Industry
Guan County	30 year wastewater BOT	Beijing Herocan
Guanghan	30 year wastewater BOT	Puresino
Guangzhou	20 year DBFO, sewage treatment	Sino French Holdings
Guangzhou	25 year wastewater BOT	Beijing Enterprises Water
Guangzhou	22 year wastewater BOT	Beijing Enterprises Water

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Guangzhou	25 year wastewater BOT	Beijing Enterprises Water
Guangzhou	22 year wastewater BOT	Beijing Enterprises Water
Guangzhou	30 year O&M, water provision	Sino French Holdings
Guangzhou	Water treatment	China Water Affairs
Guigang	30 year water BOT	Beijing Enterprises Water
Guigang	30 year wastewater BOT	Beijing Enterprises Water
Guizhou	30 year wastewater TOT	Beijing Enterprises Water
Guizhou	30 year wastewater BOT	Beijing Enterprises Water
Haikou	Water & wastewater management	VE
Haikou	Bulk water	China Water Affairs
Haining	25 year water TOT	Beijing Capital Co
Haining	30 year water BOT	Salcon Water
Handan	25 year wastewater BOT	VE
Hangzhou	26 year wastewater TOT	Tianjin Environmental
Hanzhong	Water BOT	Interchina
Harbin	28 year BOT / O&M, water treatment plant	SAUR
Hewemhu	30 year BOT W & WW	Beijing Capital Co
Hefei	23 year wastewater TOT	BCH
Heze	25 year wastewater TOT	Beijing Enterprises Water
He-Zhang	Water treatment & mains BOT	Han's Technologies
Hezhou	30 year water & WW BOT	Beijing Enterprises Water
Hohhot	30 year water BOT	VE
Honghu	Water & wastewater TOT	Tianjin Environmental
Huainan	30 year BOT WW	Beijing Capital Co
Huang Yan	30 year wastewater TOT	Beijing Enterprises Water
Huidong	Wastewater treatment	China Water Industry
Huizhou	Bulk water	China Water Affairs
Huizhou No 4	Wastewater treatment	China Water Industry
Huizhou No 6	Wastewater treatment	China Water Industry
Huzhou	22 year wastewater BOT	SIHL
Huzhou	34 year water BOT	SIHL
Huzhou	30 year wastewater BOT	Beijing Herocan
Jiangdu	23 year water BOT	Bio-Treat Technologies
Jiangling	Water treatment	China Water Affairs
Jiangmen	Wastewater treatment BOT	AGEPSG
Jiangyin	30 year wastewater TOT	China Everbright
Jiangyou	30 year wastewater BOT	Beijing Enterprises Water
Jiangyou	30 year wastewater BOT	Beijing Enterprises Water
Jiaonan	20 year wastewater BOT	Beijing Enterprises Water
Jiaozhou	20 year wastewater BOT	Beijing Enterprises Water
Jiaozhou	20 year wastewater BOT	Beijing Enterprises Water
Jinan	30 year wastewater TOT	Beijing Enterprises Water
Jinan	30 year wastewater BOT	Beijing Enterprises Water
Jinan	26 years, wastewater BOT	China Everbright

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Jinan	30 years, wastewater TOT	China Everbright
Jinan	30 year wastewater BOT	China Everbright
Jingdzehen	20 year wastewater treatment BOT	AEH
Jingzhou	Water treatment	China Water Affairs
Jingzhou	Wastewater treatment	China Water Affairs
Jinzhou	30 year wastewater TOT	Beijing Enterprises Water
Jinzhou	30 year water TOT	Beijing Enterprises Water
Jinzhou	30 year wastewater TOT	Beijing Enterprises Water
Kunming	30 year water BOT	VE
Kunshan	29 year wastewater TOT	Bio-Treat Technologies
Kunshan	29 year wastewater TOT	Bio-Treat Technologies
Lanzhou	30 year water management	VE
Leiyang	25 year water BOT	Beijing Enterprises Water
Lianjing	30 year O&M, water provision	Sino French Holdings
Lianyuangang	25 year wastewater TOT	Bio-Treat Technologies
Lianyuangang	25 year wastewater BOT	Bio-Treat Technologies
Lijin County	28 year wastewater BOT	Beijing Herocan
Ling Country	30 year wastewater BOT	China Everbright
Linyi	25 year wastewater BOT	Beijing Capital Co
Linyi	30 year water BOT	Salcon Water
Linyi City	Water & wastewater treatment	China Water Industry
Lishui	28.5 year wastewater treatment BOT	AEH
Liuzhou	30 year water management	VE
Liuzhou	25 year BOT, wastewater treatment	Global Green Tech
Lonhgua	22 year wastewater BOT	SIHL
Luyi	Water treatment	China Water Affairs
Ma'anshan	Wastewater BOT	Interchina
Maanshan	Water BOT	Beijing Capital Co
Mianyang	30 year wastewater TOT	Beijing Enterprises Water
Mianyang	30 year wastewater BOT	Beijing Enterprises Water
Mianyang	30 year wastewater BOT	Beijing Enterprises Water
Nan An City	30 year raw water BOT	Salcon Water
Nanchang	25 year wastewater BOT	AEH
Nanchang	Wastewater BOT	BCH
Nanchang	28 year O&M, water provision	Sino French Holdings
Nanchang	Water supply	Jiangxi Hongcheng Waterworks
Nanghai	Water supply	Nanghai Development
Nanjing	25 year wastewater BOT	Bio-Treat Technologies
Nanjing	Industrial wastewater treatment BOT	Nanjing Sembcorp Suiyu
Nanjing	30 year wastewater BOT	Bio-Treat Technologies
Nanjing County	30 year wastewater BOT	Easen International
Nansha	22 year wastewater BOT	Beijing Enterprises Water
Nantong	25 year water treatment BOT	AEH
Na-Yong	Water treatment & mains BOT	Han's Technologies
Ninghua	30 year wastewater BOT	Han's Technologies



<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Ningxiang	Water treatment	China Water Affairs
Panjin	30 year wastewater TOT	BCH
Pengzhou	25 year wastewater BOT	Beijing Enterprises Water
Qi Qi Har	30 year wastewater BOT	Beijing Enterprises Water
Qianshan	Water treatment	China Water Affairs
Qingbaijiang	25 year wastewater TOT	Beijing Enterprises Water
Qingdao	25 year BOT, water provision	Sino French Holdings
Qingdao	Water BOT	Beijing Capital Co
Qingdao	25 year BOT, wastewater	VE / CEI
Qingdao	40 year wastewater BOT	Beijing Enterprises Water
Qingzhen	30 year water BOT	Beijing Enterprises Water
Qinhuangdao	Wastewater BOT	Interchina
Qinhuangdao	25 year BOT, water provision	Beijing Capital Co
Qujing	26 year W & WW BOT	Tianjin Environmental
Renhua	Water treatment	China Water Affairs
Rizhao City	25 year wastewater BOT	Beijing Herocan
Sanya	30 year O&M, water provision	Sino French Holdings
Sanya	35 year concession, water provision	Sino French Holdings
Shang Qiu City	Water treatment	China Water Industry
Shanghai	Pudong, industrial water JV	Sino French Holdings
Shanghai	50 year O&M, water services	VE
Shanghai	28 year 'concession', water provision	Shanghai Fengxian Saur Water
Shanghai	20 year wastewater treatment BOT	Youlian
Shangli	Water treatment	China Water Affairs
Shen County	30 year wastewater BOT	Beijing Herocan
Shenyang	30 year O&M, water provision	Shenyang Public Utility
Shenyang	Water and wastewater treatment BOT	Shenfei Dayen
Shenyang City	Water treatment	China Water Industry
Shenzen	50 year water & wastewater BOT	VE / Beijing Capital Corp
Shenzen	Bulk water concession	GDI
Shenzhen	20 year wastewater TOT	Beijing Enterprises Water
Shenzhen	25 year wastewater BOT	Beijing Enterprises Water
Shuangilu	20 year wastewater BOT	Beijing Enterprises Water
Shuangilu	20 year wastewater BOT	Beijing Enterprises Water
Shuangliu	20 year wastewater BOT	Beijing Enterprises Water
Sihui South China	Wastewater treatment	China Water Industry
Sihui Urban	Wastewater treatment	China Water Industry
Sunijiakou	Water treatment	China Water Affairs
Suqian	30 year wastewater BOT	Bio-Treat Technologies
Suzhou	25 year wastewater BOT	Bio-Treat Technologies
Suzhou EDZ	Water & wastewater treatment	China Water Industry
Taiyuan	25 year BOT, wastewater	Beijing Capital Co
Tangshan	Water treatment	China Water Industry
Tanzhou	30 year O&M, water provision	Sino French Holdings
Tianjin	35 year concession, water provision	Sino French Holdings

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Tianjin	20 year 'concession', water provision	VE / Marubeni
Tianjin	30 year management	VE
Tianjin	26 year wastewater BOT	Tianjin Environmental
Tiazhou	18 year BOT, bulk water provision	Jiangsu Water Group
Tiazhou	27 year wastewater BOT	Beijing Enterprises Water
Tiazhou	27 year wastewater BOT	Beijing Enterprises Water
Tongling	25 year BOT, water provision	Beijing Capital Co
Urumqi	23 year wastewater BOT	VE
Wangcheng	27 year wastewater treatment BOT	AEH
Wannian	Bulk water	China Water Affairs
Wannian	Water treatment	China Water Affairs
Wannian	Wastewater treatment	China Water Affairs
Wanzhou	30 year O&M, water provision	Sino French Holdings
Weinan	22 year water BOT	VE / Beijing Capital Corp
Weinan	30 year wastewater BOT	Beijing Herocan
Wuhan	29 year wastewater TOT	Bio-Treat Technologies
Wujin	Water treatment	China Water Affairs
Wuzhou	Water treatment	China Water Affairs
Xiamen	Water & wastewater concession	SIHL
Xian	Water treatment BOT	Berlinwasser International
Xian	25 year wastewater TOT	Tianjin Environmental
Xian	30 year wastewater BOT	Beijing Herocan
Xiangtan	30 year W & WW BOT	SIHL
Xianjiang	25 year wastewater BOT	Bio-Treat Technologies
Xianyang	30 year water BOT	SIHL
Xianyang	Water BOT	Interchina
Xihua	Water treatment	China Water Affairs
Xinghua	25 year water BOT	Beijing Herocan
Xinhui	Water treatment	China Water Affairs
Xining	30 year wastewater treatment BOT	AEH
Xinyu	Bulk water	China Water Affairs
Xinyu	Water treatment	China Water Affairs
Xinyu	Water treatment	China Water Affairs
Xitang	30 year wastewater BOT	Han's Technologies
Xiuning	30 year wastewater treatment BOT	AEH
Xuancheng	30 year wastewater BOT	Bio-Treat Technologies
Xuzhou	30 year water BOT	Beijing Capital Co
Yancheng	30 year water concession	China Water
Yanshan	Wastewater treatment	China Water Affairs
Yichun	30 year water BOT	PBA Holdings
Yiliang	Wastewater treatment BOT	Han's Technologies
Yizheng	30 year water BOT	Salcon Water
Yongchuan	Water treatment	China Water Affairs
Yongchuan	Water treatment	China Water Affairs
Yongshun	30 year wastewater BOT	Easen International

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Yongzhou	30 year wastewater BOT	Beijing Enterprises Water
Yongzhou	30 year wastewater BOT	Beijing Enterprises Water
Yongzhou	30 year wastewater BOT	Beijing Enterprises Water
Yongzhou	30 year wastewater BOT	Beijing Enterprises Water
Yuanping	Wastewater & water reuse BOT	Sino-Dutch WIG / BCH
Yueyang	25 year BOT, water treatment	AEH
Yunan County	Wastewater treatment	China Water Industry
Yunan County	Wastewater treatment	China Water Industry
Yunfu City	Water & wastewater treatment	China Water Industry
Yuyao	Wastewater treatment BOT	Beijing Capital Co
Zanyi	30 year wastewater BOT	Han's Technologies
Zhangzhu	25 year wastewater TOT	AEH
Zhanhua	30 year wastewater BOT	Beijing Enterprises Water
Zhanjiang	Bulk water treatment BOT	SIHL
Zhaoan	30 year wastewater BOT	Easen International
Zhaodong City	25 year wastewater BOT	Beijing Herocan
Zhengcheng	Water treatment	China Water Affairs
Zhengzhou	30 year O&M, water provision	Sino French Holdings
Zhi-jin	Water treatment BOT	Han's Technologies
Zhongstan	22 year O&M, water provision	Sino French Holdings
Zhongye	25 year water BOT	Beijing Enterprises Water
Zhoukou	30 year water BOT	AEH
Zhoukou	Water treatment	China Water Affairs
Zhumadian	Water supply	China Water
Zibo	25 year wastewater TOT	China Everbright
Zibo	25 years, wastewater BOT	China Everbright
Zibo	25 years, wastewater BOT	China Everbright
Zibo	20 year wastewater BOO	China Everbright
Zuhai	30 year bulk water BOT	VE
Zunyi	35 year wastewater BOT	VE
Zunyi	35 year concession, water treatment	CGE Zunyi Water

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Sichuan Guangan AAA	AAA Public (China)	N/A	N/A	N/A
Jiangsu Water Group	Agbar (Spain) / Golden State (China)	1,200,000	1,245,000	2,445,000
Aquamundo	Amiantit (Saudi Arabia)	N/A	400,000	400,000
Anhui Water Resources Dev Co	Anhui Water Resources Development Co (China)	1,600,000	0	1,600,000
AEH	Asia Environment Holdings (Singapore)	1,650,000	2,625,000	3,925,000
Beijing Capital Co	Beijing Capital Co (China)	9,290,000	5,100,000	10,290,000
Beijing Anling	Beijing Enterprises / Golden State (China)	2,000,000	0	2,000,000
Beijing Enterprises Water	Beijing Enterprises Water (China)	1,530,000	13,675,000	14,115,000

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Beijing Herocan	Beijing Herocan (China)	50,000	1,700,000	<b>1,750,000</b>
Bio-Treat Technologies	Bio-Treat Technologies (China)	250,000	6,500,000	<b>6,750,000</b>
Boustead Singapore	Boustead (Singapore)	100,000	0	<b>100,000</b>
Shanghai Fengxian Saur	Bouygues (France)	3,500,000	0	<b>3,500,000</b>
BCH	BWI (VE / RWE JV) / Metito Utilities (UAE)	0	3,500,000	<b>3,500,000</b>
Cathay International Water	Cathay Intl (HK)	4,000,000	0	<b>4,000,000</b>
China Everbright	China Everbright (China)	0	5,300,000	<b>5,300,000</b>
China Water Affairs	China Water Affairs (China)	7,800,000	2,200,000	<b>9,200,000</b>
China Evergreen	China Water Group (China)	0	250,000	<b>250,000</b>
China Water Industry	China Water Industry (China)	6,200,000	7,700,000	<b>9,200,000</b>
Chongqing Water Group	Chongqing municipality (China) / SE (France)	15,000,000	0	<b>15,000,000</b>
Cheung Kong Infrastructure	CKI (PRC)	N/A	N/A	<b>N/A</b>
Globe Environment	Darco (Singapore)	650,000	0	<b>650,000</b>
Shenfei Dayen	Dayen (Singapore)	0	125,000	<b>125,000</b>
Easen International	Easen International China)	0	500,000	<b>500,000</b>
GDI	GDI (HK)	5,800,000	0	<b>5,800,000</b>
Global Green Tech	Global Green Tech (HK)	N/A	800,000	<b>800,000</b>
Golden State Environmental	Golden State (China)	0	1,000,000	<b>1,000,000</b>
AGEPSG	Guozhen EP (China)	0	5,000,000	<b>5,000,000</b>
Western Water	Han's Technologies (USA)	330,000	650,000	<b>980,000</b>
Hong Kong & China Gas & Light	HK & China Gas & Light (China)	1,800,000	0	<b>1,800,000</b>
Hyflux	Hyflux (Singapore)	300,000	0	<b>300,000</b>
Hyflux Water Trust	Hyflux (Singapore)	750,000	1,100,000	<b>1,700,000</b>
Interchina	Interchina Holdings (HK)	900,000	900,000	<b>1,800,000</b>
Jiangxi Hongcheng W'works	Jiangxi Hongcheng W'works	1,550,000	0	<b>1,550,000</b>
Nanhai Development	Nanhai Development Co	1,100,000	500,000	<b>1,100,000</b>
Ningbo Fuda Company	Ningbo Fuda (China)	750,000	0	<b>750,000</b>
Pinang Water	PBA (Malaysia)	500,000	0	<b>500,000</b>
PBA Holdings	PBA (Malaysia)	250,000	0	<b>250,000</b>
Kerry Utilities	PPB (Malaysia)	0	1,000,000	<b>1,000,000</b>
Sino Water	Puncak Niaga (Malaysia)	250,000	0	<b>250,000</b>
Qianjiang Water Resources	Qianjiang WR (China)	500,000	0	<b>500,000</b>
Sino-Dutch WIG / BCH	Rabobank (Netherlands) & GreenTech Eng (China) / BWI (RWE / VE) & Metito	150,000	250,000	<b>250,000</b>
Ranhill KWI	Ranhill Utilities (Malaysia)	125,000	0	<b>125,000</b>
Salcon Water	Salcon Eng (Malaysia)	2,420,000	200,000	<b>2,620,000</b>
Sino French Holdings	SE (France) / NWS Holdings (China)	19,000,000	2,300,000	<b>21,000,000</b>
China Water Company	Sembcorp (Singapore)	1,900,000	2,500,000	<b>4,400,000</b>
Nanjing Sembcorp Suiyu	Sembcorp (Singapore)	0	0	<b>0</b>

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
SIHL	Shanghai Ind. Holdings (China)	5,400,000	6,000,000	<b>6,900,000</b>
Shanghai Lingqiao Tap Water	Shanghai municipality	N/A	0	<b>N/A</b>
Shanghai Chengtou	Shanghai municipality	N/A	0	<b>N/A</b>
Shanghai Urban Construction Group	Shanghai UCS (China)	0	3,000,000	<b>3,000,000</b>
Shanghai Young Sun	Shanghai YS (China)	0	800,000	<b>800,000</b>
Shenyang Public Utility	Shenyang municipality	5,750,000	0	<b>5,750,000</b>
Shenzhen Kondarl	Shenzhen Kondarl (China)	N/A	N/A	<b>N/A</b>
Sound Group	Sound Global (China)	1,300,000	10,700,000	<b>12,000,000</b>
Suzhou New District	Suzhou municipality	100,000	0	<b>100,000</b>
Puresino	Taliworks (Malaysia)	0	200,000	<b>200,000</b>
Tianjin Capital Env Protect	Tianjin Environ (China)	1,200,000	12,350,000	<b>12,350,000</b>
Veolia Water	VE (France)	18,250,000	1,050,000	<b>20,650,000</b>
Veolia Water / CEI	VE (France) / China Everbright (China)	0	800,000	<b>800,000</b>
CGE Zunyi Water	VE (France) / Citic (China)	500,000	0	<b>500,000</b>
Wuhan Sanzheng Industry	Wuhan municipality	1,600,000	0	<b>1,600,000</b>
Xin Jiang Hui Tong	Xinjiang HT (China)	380,000	0	<b>380,000</b>
Xinjiang Urban Const	Xinjiang Urban (China)	N/A	N/A	<b>N/A</b>
Zhongshan Public Utilities	Zhongshan Public Utilities (China)	N/A	N/A	<b>N/A</b>

*Sources:*

*ADB (2005) Final report on major issues and recommendations of PPP in the water sector in China, Asian Development Bank, Manila*

*Browder G J (2007) Stepping Up: Improving the performance of China's urban water utilities. The World Bank, Washington, USA*

*EIU (2007) China Hand, Economist Intelligence Unit, London*

*GWI (2007) Global Water Market 2008: Opportunities in Scarcity and Environmental Regulation, GWI, Oxford, UK 2007*

*Lam, P-L (2003) A comparative study of water utilities in Hong Kong and Macau. Asian Water, December 2003, pp 19-22*

*Lee, S. (2003) The Transformation of the Shanghai Water Sector in the Reform Area: Social Actors and Institutional Change. PhD Thesis, SOAS, London University*

*Macao Water (2005) Colours of Water, Colours of Life, 2004 Annual Report & Accounts*

*Macao Water (2006) 2005 Annual Report & Accounts*

*Macao Water (2007) 2006 Annual Report & Accounts*

*OECD (2007) OECD Environmental Performance Reviews: China, OECD, Paris*

*SEPA (2002-2008) Report on the State of the Environment in China, 2002, 2003, 2004, 2005, 2006 & 2008, State Environmental Protection Agency, Beijing*

## Colombia

<b>Economics (2008)</b>	
GNI per capita	USD4,620
GNI per capita (PPP)	USD8,430
GDP in Agriculture	9%
GDP in Industry	36%
GDP in Services	55%

### PSP plans

PSP has been supported since 1994, starting with Law Number 142 of 1994. This Law provides incentives for private firms to join local and regional authorities in the task of upgrading water, sewerage and sewage treatment services. In reality, PSP remained the exception until the passing of Law Number 226 of 1995. This established the basic rules for approval of each programme. This Law gives the company's employees and retirees, as well as other employee-owned cooperatives, unions and organisations, the first option to purchase the entity.

<b>Population</b>	
2009 (million)	45.7
2020 (million)	55.0
Urbanisation in 2008	74.5%
Urbanisation by 2020	78.0%
In urban agglomerations, 2050	86.0%

### Legal framework and service delivery

Municipal water and sewerage entities serving a population in excess of 8,000 have been identified as potentially suitable for private sector management and investment. The Law on Environmental Principles (Law Number 99 of 1993) lays out various environmental and public health service objectives, which are to be administered by the Ministry of the Environment. A Vice Ministry of Water and Sanitation was created in 2006 to focus on policy development and implementation.

A report by the Instituto de Hidrología, Meteorología y Estudios Ambientales warns that 70% of Colombia's population may face water shortages within the next 15 years if water resources are not properly managed. Drought has already caused water shortages in 7 cities in Valle del Cauca, Huila, Boyaca, Norte de Santander and on the Atlantic coast. The three largest cities in Colombia, Bogotá, Medellín and Cali, officially have a service coverage of around 94% for piped water and 87% for sewerage.

Superservicios, the public service regulator found in 2005 that 7.6million people were supplied with water unfit for human consumption in 2005, including 84% of the people served by systems for less than 10,000 residents (6.7million) against 4% served by larger systems (0.9million people). 28.5million people, or 62% of the population in 2005 were served by 206 suppliers covering 312 municipalities.

Colombia's Agua Transparente programme was launched in 2008, aiming to control the funding used in water projects and the implementation of initiatives, as well as supervising tenders related to water projects, in an effort to avoid corruption. This is in conjunction with USD599million being invested in waterworks in five departments during 2008. The government aimed for all 32 departments to have master water plans, covering water for human consumption, irrigation and industrial activities as well as sewerage and wastewater treatment, by 31 December 2008. It is evident that this has been broadly attained.

<b>Urban Data (2008)</b>	
With improved drinking water	99%
With household drinking water	94%
With improved sewerage	81%
With household sewerage (2004)	90%
With 2 <sup>o</sup> sewage treatment	8%

In 2006, the water minister said that Colombia will have to invest some COP8.29trillion (USD3.46billion) in 2007-2010 to improve water and sewerage services. This is required to raise urban potable water coverage to 98.5% by 2010. In 2005, Colombia provided USD654million in funding. Colombia's government aims to provide 95% water coverage and 85% sewerage coverage in all urban areas by 2010.

The Vice-Ministry of Water and Sanitation has budgeted USD5.2billion for 2008-10, including USD820million during 2008. The government plans to boost the proportion of people with access to water and sewerage in urban areas to more than 90% by the end of the decade. The government aims to hand over the management of urban water services in the provinces to private companies or corporatised entities through concession contracts over 20 or 25 years, via auctioning the concession contracts to private companies, which will commit to carrying out an investment plan over the ensuing two years of the current programme. The operating companies are expected to spend USD1.84billion out of the total USD5.2billion required.

In October 2008, it was announced that Colombia plans to invest USD14.1billion on water and sewerage services between 2007 and 2019, including USD9.6billion on urban water and sewerage. By 2019, it is intended that 50% of all sewage will be treated.

USDbillion	2007-10	2011-15	2016-19
Urban water & sewerage	2.7	3.7	3.2
Total water spending	4.5	5.4	4.2

Source, BN Americas, 1<sup>st</sup> October, 7<sup>th</sup> October & 13<sup>th</sup> October 2008

In 2006 Bogotá applied for World Bank financing to support a USD60million urban upgrading program, the bank reported on its website. Nearly half of Bogotá's population still lives in informal settlements where they lack basic services and need improved housing, the bank has said.

In 2003, the World Bank has approved a USD16million loan supporting the Bogotá Urban Services Project, which aims to improve water and sewerage services, particularly for residents in low-income areas. EAAB, the municipal utility, will address efficiency and service quality issues through cost reductions and support greater private sector participation in its operations. At the same time, EAAB appointed three companies to undertake service operations in five areas of the capital. Aguas Capital, Agua Azul and EPM Bogotá Aguas will cover the five zones. The agreements will run for five years and are worth an estimated USD127million in total.

### Additional spending plans

In 2009, Colombia's President Álvaro Uribe announced that USD2billion would be spent on water projects as part of the country's anti-crisis investment plan, including water treatment plants and network expansion. Other plans include a USD1.1billion plan for restoring the Bogotá river basin by 2030, which will be finalised in 2014. It will include a primary wastewater treatment plant to serve the city which will cost USD330million. The corporatized utility EPM is spending USD450million on a wastewater treatment works serving Medellín and the Medellín river.

### Concession awards to date

According to the International Labour Organisation (ILO), by 1998 there had been two PSPs prior to the 1994 law and a further 10 since then. 15% of the population was served by private companies in 2006 and in 2004, out of the 1,500 urban water service provision entities, 125 were private sector players and 48 mixed public-private entities.

In 2006 Aguas Kpital was awarded a COP600billion 15-year contract to operate potable water and sewerage services in Cúcuta city in Colombia's Norte de Santander department. Aguas Kpital's bid for the contract was based on an average water rate of COP30,000 (USD12.83) for consumption of 19m<sup>3</sup> per month.

<b>Freshwater</b>	
Annual availability (2007)	2,112km <sup>3</sup>
Per capita (2008)	46,921m <sup>3</sup>
Annual withdrawal (2007)	1%
Domestic (2007)	50%
Industrial (2007)	4%
Agriculture (2007)	46%

<b>Groundwater</b>	
Annual availability (1998)	510.0km <sup>3</sup>
Per capita	13,533m <sup>3</sup>

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Bogotá	7,594,000	8,900,000	Sewage treatment BOT rescinded
Cali	2,514,000	2,963,000	Emcali, city multi utility corporatised
Medellin	3,058,000	3,522,000	EPM, city multi utility corporatised
Barranquilla	1,857,000	2,042,000	Water & sewerage concession
Bucaramanga	1,019,000	1,201,000	N/A
Cartagena	954,000	1,152,000	Water & sewerage concession
Cucuta	852,000	1,012,000	PSP under development

**Private sector contracts awarded** (Please see the relevant company entry for details)

<b>Location</b>	<b>Contract</b>	<b>Company</b>
Bogotá	Water O&M	Aguazul Bogotá
Santo Domingo	Water O&M	Aguazul Bogotá
Santa Marta	20 year water and sewerage concession	Tecvasa
Barranquilla	17 year urban services concession	Tecvasa
Cartagena	25 year water and sewerage concession	Agbar
Monteria	20 year water provision concession	Proactiva
Tunja	20 year water provision concession	Proactiva

**Private sector company operations** (Please see the relevant company entry for details)

<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Agbar	Agbar (Spain)	726,000	726,000	<b>726,000</b>
Tecvasa	Tecvasa (Spain)	1,770,000	1,770,000	<b>1,770,000</b>
Proactiva	FCC (Spain)/VE (France)	480,000	272,000	<b>480,000</b>
Aguazul Bogotá	ACEA (Italy)	3,900,000	0	<b>3,900,000</b>

Sources:

*GWI (2008) Colombia kicks off \$5.2bn water upgrade plan, GWI, July 2008*

*Superintendencia de Servicios Sanitarios (SSPD) (2008), Sistema Único de Información, SSPD, Bogotá, Colombia*

*World Bank (2008) Desarrollo Económico Reciente en Infraestructura (REDI) en Colombia, World Bank*



**COSTA RICA**

Costa Rica had a population of 4.2million in 2002, 60% living in urban areas. The Instituto Costarricense de Acueductos y Alcantarillados (AyA) is the state water authority. AyA provides potable water to 90% of the country's population, including 99% coverage in urban areas. In the metropolitan area, 69% of the population with potable water also have adequate sewer systems. On a national level, 45% of the population with potable water also have adequate sewer systems. In contrast, 5% of wastewater receives any form of treatment.

In 2003, a project sponsored in 2002 by the Inter-American Development Bank (IADB) to upgrade and manage wastewater service infrastructure in San José was cancelled. The project is now expected to be relaunched by the World Bank. It sought to expand and rehabilitate the sewerage system in a metropolitan area of San José. Under the concession approach, the project would have required an estimated USD280million to upgrade the infrastructure and build a major WWTW with the financing provided by a mix of international institutions and commercial banks. Following a change of government in 2002, there was a change in the management of AyA, which have given opponents the opportunity to derail the project. The current proposals are understood to focus on a DBO project, rather than an outright concession. Finance would come from a World Bank loan.

In 2010, the national college of engineering and architecture declared that concessions for water and wastewater ought to be considered, subject to an appropriate regulatory model.

Historically, over 60% of the finance for capital projects came from the government, but this is being reduced to 40% through improved operational efficiency and tariff collection. Between 1990 and 2006, USD203million were invested in water supply and sanitation infrastructure. In 2002 AyA proposed a sector modernization program running to 2020 which envisages maintaining urban water coverage while raising urban sewerage coverage to 89% by 2020. Total capital spending (including rural services) will be USD1.6billion, some USD80million per year.

**CUBA**

<b>Population</b>	
2009 (million)	11.2
2020 (million)	11.4
Urbanisation in 2008	75.7%
Urbanisation by 2020	77.0%
Urbanisation by 2050	84.4%

**Water and sewerage services**

In 1996, piped water was provided to 97.9% of the urban population and 75% of the rural population. The 2000 target was for 99.9% coverage for urban areas and 100% coverage for rural areas against 95% and 78% respectively in 2004. Sewerage covered 94.6% of the urban population and 78.2% of the rural population in 1996. Coverage targets for 2000 were 99.9% and 98.9% respectively, against 99% and 95% in 2004. 22% of urban sewage effluents are treated at five secondary sewage treatment works.

<b>Urban data (2008)</b>	
With improved drinking water	96%
With household drinking water	82%
With improved sewerage	94%
With household sewerage (2004)	50%
With 2 <sup>o</sup> sewage treatment	15%

**Capital spending plans**

In 1996, the government announced that it was aiming for the treatment of all urban sewage effluents over the next ten years at a total cost of USD643million for rehabilitating the extant sewerage system and sewage treatment works, plus a further USD747million for service extension. Total capex needs for water provision are estimated at USD1.5billion.

<b>Freshwater</b>	
Annual availability (2007)	38km <sup>3</sup>
Per capita (2008)	3,402m <sup>3</sup>
Annual withdrawal (2007)	22%
Domestic (2007)	19%
Industrial (2007)	12%
Agriculture (2007)	69%

<b>MAJOR CITIES</b>			
City	2005	2015	Status
Havana	2,189,000	2,151,000	Agbar O&M

**Urban water and sewerage**

1981	Piped water	Indoors	Sanitation	Flush
Havana	100%	90%	98%	97%
Santiago de Cuba	96%	76%	97%	62%
Camaguey	88%	63%	97%	57%
Holguin	64%	40%	92%	37%

<b>Groundwater</b>	
Annual availability (1998)	8.0km <sup>3</sup>
Per capita	720m <sup>3</sup>
Annual withdrawal (1975)	3.8km <sup>3</sup>

### Agbar and privatising Havana's services

Interagua formed Aguas de La Habana, a JV with the Cuban Government in 1999, for two water management contracts currently serving 500,000 people, with an eventual coverage of 1,400,000 people. The contracts serve La Habana and the resorts of Cayo Coco and Varadero. Water supply systems in Havana were renovated for 298,000 people in 2001-02. The 25 year water management contract for Havana is being supported by a USD24.7million loan by Agbar. Revenues are USD9million pa for 115million m<sup>3</sup> of water provided annually

### Service development in Varadero and Havana

<b>Varadero</b>	<b>1994</b>	<b>2006</b>
Population covered	95%	100%
Hours service/day	18	24
Number of connections	5,000	11,000
<b>Havana</b>	<b>2000</b>	<b>2006</b>
Population covered	95%	100%
Hours service/day	8	10
Number of connections	327,000	365,000

Source:

*Presentation by José María Tura, General Manager of Aguas de La Habana to Agbar conference "Five international examples of environmental management in the service of the citizens" on 19th June 2007*

**ECUADOR**

<b>Economics (2008)</b>	
GNI per capita	USD3,690
GNI per capita (PPP)	USD7,780
GDP in Agriculture	7%
GDP in Industry	40%
GDP in Services	53%

**International support**

In 1999, the Municipal Water and Wastewater Company of Quito started a USD170million service provision upgrade project to provide improved water and sewerage for 600,000 people. The work is being supported by a loan from the IADB. The IADB is also providing USD41million out of USD51million being spent on water and sewerage rehabilitation work in Guayaquil by Ecapag.

<b>Population</b>	
2009 (million)	13.6
2020 (million)	16.0
Urbanisation in 2008	65.6%
Urbanisation by 2020	72.5%
Urbanisation by 2050	83.6%

A tradition of municipalities operating as autonomous entities has in turn held back the regulation required to drive forward investment. Attempts since 1996 to create a national water regulator have been thwarted. Water losses are 40-50% and in one case 70% or even higher, including illegal connections. Due to local political pressure municipal utilities are unwilling to increase rates to replace pipes.

<b>Urban Data (2008)</b>	
With improved drinking water	97%
With household drinking water	96%
With improved sewerage	96%
With household sewerage (2004)	62%
With 2 <sup>o</sup> sewage treatment	0%

<b>Freshwater</b>	
Annual availability (2007)	432km <sup>3</sup>
Per capita (2008)	32,044m <sup>3</sup>
Annual withdrawal (2007)	4%
Domestic (2007)	12%
Industrial (2007)	5%
Agriculture (2007)	83%

**The Guayaquil concession**

A 30 year concession for water and sewerage services for the city of Guayaquil was gained by International Water's Interagua in 2000. Water provision by Empresa Cantonal de Agua Potable y Alcantrillado de Guayaquil (Ecapag) will rise from 63% in 2000 to 95% by 2011, with 55,238 new connections in poor areas during the first five years and sewerage coverage increasing from 53% to 90% by 2020. The Inter American Development Bank provided a USD30million loan in 2001 for the initial works programme in 2002-03. Although the PSP of Quito's services has been considered on an informal basis in recent years, political constraints remain an obstacle. From June 2006, an extra USD30million is being invested by Interagua on an additional 8.56km of pipelines beyond the concession contract. This has been enabled by higher than expected tax revenues for telephone services. While the concession has been under political pressure in 2009-10, it is understood to continue to operate in a normal manner.

<b>Groundwater</b>	
Annual availability (1998)	134km <sup>3</sup>

Per capita	10,596m <sup>3</sup>
------------	----------------------

### Service provision in the main cities

	Piped water	Indoors	Sanitation	Flush
Quito	85%	70%	97%	93%
Guayaquil	61%	41%	95%	42%
Cuenca	96%	86%	95%	93%
Machala	63%	42%	92%	76%

MAJOR CITIES			
City	2005	2015	Comments
Guayaquil	2,387,000	2,975,000	Water & wastewater PSP
Quito	1,514,000	1,839,000	PSP under consideration

Ecuador's president-elect Rafael Correa announced in 2006 that the government needs to invest some USD3billion. Responsibility for this will be handed over to provincial governments, which will request the corresponding loans from the state bank. PSP has been ruled out for the time being.

Overall, 68% of the urban population in 1999 was considered to have access to safe drinking water and 48% to have adequate sanitation. It is of interest to note that the connection to indoor taps and lavatories in many medium sized towns is higher than in Quito or Guayaquil. Some 5% of Quito's sewage effluents are subject to treatment.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Samborondón	Water & sewerage services	Tecvasa
Guayaquil	Water & wastewater concession	ECAPAG

Empresa Metropolitana de Alcantarillado y Agua Potable (Emaap), Quito's water utility intends to award a USD600million 20 year water and power BOT, to supply the city with water and power via a 109km water channel from the Valle Vicoso River to its Bellavista water treatment plant. The population of Quito is forecast to double by 2020. The Inter-American Development Bank approved a USD40million loan to Emaap in September 2002 to support the first phase of a USD110million programme to expand water and sanitation services and reduce flooding and landslides. This will enable Emaap to extend water and sewerage service to low-income sectors of the population. Manta (Manabi Province) is seeking to privatise Eapam, its water utility, which serves 200,000 people. Guayas and Pinchincha Provinces are also examining PSP options.

It was anticipated that a 30 year concession for Emaap would be awarded by 2007, but this did not take place although new opportunities may emerge for new water supply schemes.

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Tecvasa	Tecvasa	100,000	100,000	100,000
ECAPAG	VE (France)	2,500,000	2,500,000	2,500,000

**INDIA**

<b>Economics (2008)</b>	
GNI per capita	USD1,040
GNI per capita (PPP)	USD2,930
Agriculture	17%
Industry	29%
Services	54%

**Politics and Government**

The pace of progress is summed up by the National Water Resources Council, which was formed to address urgent state and national water issues. It has met four times since 1983 and no decisions have yet been made on updating the 1988 national water policy.

India's National Water Policy of 2002 places drinking water as its chief priority (ADB, 2007). The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) aims to channel USD12billion of central funding into 63 identified cities between 2006 and 2012, with an emphasis on urban infrastructure planning and capacity building and O&M cost recovery by 2012. India aims to achieve 100% urban water coverage during its 11<sup>th</sup> Five Year Plan (2007-12).

India originally planned to have universal access to water by 1997, the 50<sup>th</sup> anniversary of its independence. According to WHO and UNICEF data, urban water coverage was 81% in 1991 and 89% in 2004, while the 2001 Census of India found 50% of households had a tap within their premises, 19% with a tap near their premises and 16% had access to a hand pump. The revised National Water Policy of 1987 was adopted by the National Water Resources Council on 1<sup>st</sup> April 2002. It states that "adequate drinking water facilities should be provided to the entire population" (Article 8) and that PSP "should be encouraged...wherever feasible" (Article 13). *Source: ADB (2007) Country Paper: India. Asian Water Development Outlook, ADB, Manila*

For cities, water and sewerage policy is carried out at three levels: central government, the member states and city government. Central government directs overall policy. The Ministry of Environment and Forests (MEF) oversees the Central Pollution Control Board (CPCB) and the National Rivers Conservation Directorate (NRCB). The CPCB is backed by the 1974 Water (Prevention and Control of Pollution) Act and sets national environmental standards (individual states are free to exceed them) and policy. Each State Pollution Control Board in turn reports to the CPCB, while being responsible for ensuring compliance with the government's environmental law. The Water (Prevention and Control of Pollution) Cess Act 1977 compels specified industries to pay fees to the relevant State Pollution Control Boards for water consumed. The 1995 Water Information Act puts the centralisation of water data on a statutory basis. The NRCB is involved in the various River Action Plans designed to improve the water quality of India's 14 main water basins.

The MUD (Ministry of Urban Development) advises all state level plans. It examines proposals and provides guidance. Plans, when approved are forwarded to the Ministry of Finance and the Department of Economic Affairs for external support, for example via the World Bank and the Asian Development Bank, along with the ODA on a more local basis. Cities are autonomous from central government with regard to PSP policy. The MUD is positive about PSP on an O&M and BOT basis, reflecting their concern about the pace of sanitation projects. The cities of Delhi, Bombay (Mumbai), Calcutta, Hyderabad, Bangalore and Madras can set their own tariffs.

The MUD water provision targets are 110L/day for cities and 270L/day for Delhi. In 1992, it was found that the average per capita water supply for Class I towns (100,000 and above) was 147L/day and 78L/day for Class II towns (50,000 to 100,000).

**Only connect?**

The Indian Government is considering a scheme to link 37 of the country's rivers into the canal network at a cost variously estimated in 2003 at USD116-200billion against an estimate of USD68billion in 1995. To date, nine years of feasibility studies have taken place and construction would take a further 14 years to complete. Bangladesh has raised objections about the losses that the project would entail.

<b>Population</b>	
Total 2009 (million)	1198.0
Total 2020 (million)	1,246.4
Urbanisation in 2008	29.5%
Urbanisation by 2020	34.3%
Urbanisation by 2050	55.2%

### Infrastructure development

According to the Ministry of Rural Development, 1.2million out of 1.4million villages, or 89% had access to water in 2002, with RS340billion (EUR7.45billion) having been spent on various drinking water projects across the country. The UNICEF 2000 estimate for access to safe drinking in rural areas in India was 79%. The Government had set a target of providing universal rural drinking water connections by March 2005, drinking water for the urban population by March 2007 and improved sewerage for 75% of the urban population by March 2007.

According to the WHO/UNICEF reports in 2004 and 2006, this is most unlikely as data from the Governmental Planning Committee of India found that the coverage of rural water in 1991 was about 55% and in 2004 it had risen to just above 73%.

### Water and sanitation, India (million people)

	<b>1991 Coverage</b>	<b>1991 Uncovered</b>	<b>2004 Coverage</b>	<b>2004 Uncovered</b>
Rural Water	55.54%	44.46%	73.2%	26.8%
	348.8million	279.2million	542.4million	198.6million
Rural Sanitation	6%	94%		
	38million	596million	No data	No data
Urban Water	81.38%	18.62%	89%	11%
	176.6million	40.4million	267million	33million
Urban Sanitation	44%	56%	63%	37%
	124million	158million	189million	111million

Data is from the 2001 Census of India.

### Urban households: Sanitation

Water closet	46.1%
Pit latrine	14.6%
Other latrine	13.0%
Internal sanitation	73.7%
Closed drainage	34.5%
Open drainage	43.4%
No drainage	22.1%

### Urban households: Drinking water

Tap	68.7%
Hand pump	16.2%
Other	19.1%
Tap – within premises	49.7%
Tap – near premises	15.1%
Tap – away	3.9%

For Class 1 cities, 73% of water is abstracted from surface water, 23% from groundwater and 4% from combined sources. For cities in major river basins, these are 68%, 30% and 2% respectively, and for cities in coastal areas, 87%, 3% and 10%. Overall, 32% of usable groundwater resources are currently being extracted.

Spending on water and sanitation has increased in recent years and this trend is set to continue. The estimated cost will be RS204,898million, with RS83,506million coming through the World Bank and RS18,060million from Hudco. Both the timings and the costs are likely to be on the optimistic side, with universal access to potable water unlikely before 2015 and sanitation taking another decade. The real cost for access to water is likely to be in the region of RS400-800billion and a further RS500-1,000billion for sanitation and wastewater treatment.

<b>Urban Data (2008)</b>	
With improved drinking water	96%
With household drinking water	48%
With improved sewerage	54%
With household sewerage (2004)	25%
With 2 <sup>o</sup> sewage treatment	3%

### City utility performance

A study co-sponsored by the Asian Development Bank in 2007 has provided a significant amount of data about water and sewerage services in India's leading cities.

<b>Water service coverage</b>				
<b>Coverage</b>	<b>Availability</b>	<b>UFW</b>	<b>Metering</b>	
	<b>(%)</b>	<b>(hours/day)</b>	<b>(%)</b>	<b>(%)</b>
Ahmadabad	74.5	2.0	N/A	3
Amritsar	75.7	11.0	57	4
Bangalore	92.9	4.5	45	96
Bhopal	83.4	1.5	N/A	0
Chandigarh	100	12.0	39	79
Chennai	89.3	5.0	17	4
Coimbatore	76.1	3.0	41	100
Indore	77.3	0.8	N/A	0
Jabalpur	75.2	4	14	0
Jamshedpur	74.4	6.0	13	1
Kolkata	79.0	8.3	35	0
Mathura	70.0	2.0	N/A	0
Mumbai	100.0	4.0	13	75
Nagpur	91.5	5.0	52	40
Nashik	92.6	3.5	60	80
Rajkot	98.1	3.5	23	0
Surat	77.4	2.5	N/A	2
Varanasi	77.7	7.0	30	0
Vijayawada	70.5	3.0	24	6
Visakhapatnam	49.2	1.0	14	1
Average	81.2	4.3	32	25

<b>Water production and people covered</b>			
	<b>Water production</b>	<b>Connections</b>	<b>People served</b>
	<b>(m<sup>3</sup> per day)</b>		
Ahmadabad	623,836	556,734	3,716,624
Amritsar	171,005	127,786	804,455
Bangalore	923,090	486,850	4,978,330
Bhopal	258,000	105,012	1,418,460
Chandigarh	381,280	139,300	1,150,000
Chennai	623,836	344,079	2,364,725
Coimbatore	228,400	113,762	799,000
Indore	183,000	159,104	1,700,000
Jabalpur	175,115	46,260	790,000
Jamshedpur	370,110	38,800	458,000
Kolkata	971,560	262,839	3,948,000
Mathura	38,172	24,643	238,000
Mumbai	3,200,000	309,226	13,000,000



<b>Water production and people covered</b>			
	<b>Water production (m<sup>3</sup> per day)</b>	<b>Connections</b>	<b>People served</b>
Nagpur	608,220	265,231	2,227,990
Nashik	310,000	127,562	1,250,000
Rajkot	143,836	183,879	983,000
Surat	554,685	310,836	2,954,000
Varanasi	270,000	114,907	1,243,000
Vijayawada	131,833	78,298	600,000
Visakhapatnam	228,451	85,668	750,000

### **Sewerage and sewage treatment**

Sewerage services are defined as operating on two levels. 'Sanitation' refers to lavatories with a two septic tank composting system. 'Sewerage' refers to mains sewerage. Access means at least a public lavatory in the same street.

The sewerage connection figure stated refers only to the 212 Class I cities (a population of 100,000+, covering 102.9million people in 1988). In class 1 cities, 20% of effluents are treated (13% secondary and 7% primary). In Class II cities (50,000-100,000), covering a further 20.7million people, 0.4% sewage is subject to primary treatment and 1.7% to secondary treatment. There are no other identified sewage treatment works in India. Overall, 8 out of 3,119 towns and cities have complete sewerage and sewage treatment services. 20% of towns and cities have partial service coverage.

In 2002, 20% of people in urban areas had access to water-flush toilets connected to a sewerage system and 14% use water-borne toilets connected to septic tanks or leach pits. In rural areas, 20% have access to sanitary toilets.

Informal examinations of the 14 major river basins in the 1990s found that 30% of their length is of I-II quality and 70% is of III-IV quality. Some sources maintain that the 70% figure refers to Class IV only. Sewage effluents are estimated to account for 75% of the wastewater volume and 50% of the total pollution load.

### **The politics of PSP**

India's exceptionalist tradition means that the onus lies with foreign investors to argue the merits of their proposals in Indian terms. The National Rivers Conservation Directorate is willing to support BOT bids as part of its future policy. A number of states and cities, including Harayana state, Calcutta and the Ganges Basin are understood to be keen to look at STW BOTs. In contrast, the Government seeks private sector investment first in the area of drinking water.

The Congress Party has indicated that it supports international involvement for drinking water provision and sewage treatment projects. As part of the 2004 budget, the Government announced plans for a desalination plant in Chennai. This would be the first of a series of such plants to be built near Chennai, the coastal capital city of the southern Indian state of Tamil Nadu in 2004. The project will be financed through a public-private partnership. The RS10billion (USD217.39million) plant would have a capacity of around 300millionL per day. It was also emphasised that public-private partnerships will be encouraged for the expansion of water supply and sanitation. A Board for Reconstruction of Public Sector Enterprises (BRPSE) will advise the Government on the measures to be taken to restructure PSEs, including cases where disinvestment or closure or sale is justified.

The Accelerated Rural Water Supply Programme (ARWSP) was allocated RS26billion in 2004-05. A report on the programme's performance in 2002-07 by the Comptroller and Auditor General in 2008 found many shortfalls, especially in cost and time overruns, and non functional and uncompleted projects.

The BJP at the national level has also stated that it supports the PSP of utilities, allied with foreign investment. Local BJP administrations such as the Mumbai Municipal Council will not necessarily support PSP. The Left Front remains ambiguous about foreign investment. Their stance is that foreign investors ought to demonstrate that India will benefit from their actions. The *swadeshi* (self-reliance) approach is losing favour, with only a small proportion of middle-income families supporting it.

### Outsourcing work in progress

Progress has been made in some areas. Involving the private sector in the contracting out of operation and maintenance (O&M) work has been gathering in popularity in India. In Madras, contracting out sewerage O&M since 1993 has resulted in savings of 20%. In Ajmer (Rajasthan), a service contract for water piping, pumping and treatment O&M has been regarded as a success, while Hyderabad has contracted out staffing for water treatment O&M work. Proposals for private sector management in Goa and the cities of Tirupur and Dewas are also currently under active consideration. The partial PSP of Tirupur's services has suffered from severe underfunding to date. The Tirupur water provision BOT was meant to get the go-ahead in March 1999, but has suffered from delays. This is due to a lack of support from industrial customers, who prefer irregular supplies of tankered water than the RS45 per 1,000L to be charged. The RS11.6billion project involves bulk water provision, followed by water distribution and sewerage with a 30 year concession period. The Goa project is for abstracting water at source, transporting it 60km to a reservoir and handing it over to the municipality. In addition, the management of the sewerage network will be put out to private sector operation. This project has been under development since early 1997.

In Bangalore leakage detection and strategic planning is partially outsourced and private detectives – paid only by results – are employed to detect illegal water connections. Similarly Chennai Metro has also shared its use of service contracts. Such cities say they have contracted out between 50% and 100% of the management of water treatment plants, pumping stations and wastewater treatment plants and that this has generated cost savings of between 10% and 50%.

<b>Freshwater</b>	
Annual availability (2007)	1,261km <sup>3</sup>
Per capita (2008)	1,105m <sup>3</sup>
Annual withdrawal (2007)	51%
Domestic (2007)	9%
Industrial (2007)	5%
Agriculture (2007)	86%

### Water supply and demand

If current trends over the next 50 years continue, the Tata Energy Research Institute (TERI) predicts that India's rivers and lakes will no longer be able to meet the demand for water from the country's 1.57billion people. Water availability per person has already gone down from 6,000m<sup>3</sup> in 1947 to 2,000m<sup>3</sup> in 1997 and could fall to 760m<sup>3</sup> by 2047. India currently has a national average of 2,464m<sup>3</sup> per capita, although in some regions it is as low as 411m<sup>3</sup>. India will become a water-scarce nation by 2050 unless urgent steps are taken that go beyond government capital investment in irrigation projects. In three agro-ecological zones (Western plains and Kachch, Northern plains, and the Bengal and Assam plains), the availability of water in 2047 will be less than 75% of the demand. Although the greatest demand for water will still come from agriculture, domestic water demand will increase from 20,000million m<sup>3</sup> in 1997 to about 41,000million m<sup>3</sup> per year in 2047. Moreover, the demand will be concentrated in the cities and will be for water of higher quality.

### Demand by industry

1970	6million MI
1990	15million MI
2000	30million MI
2025	120million MI

### Pricing

Water was traditionally seen as God's gift both by Hindus and Muslims. This means that there is considerable pressure at the local and rural level for it to be provided as a free (or nominally priced) resource, especially for domestic use. The 74<sup>th</sup> constitutional amendment gives local authorities the responsibility for planning, operating, maintaining and upgrading water supply, sewerage and sanitation services. Funds have to be raised by the authority, which also has the right to determine and enforce its own charges. In many cases, attempts to start operating water services on a self financing basis have focused on using higher industrial charges to cross subsidise domestic fees.

Given the small size and uneven distribution of India's industry, this approach has not met with great success to date.

<b>Economics; operating spending, income and capital spending</b>			
	<b>O&amp;M spend pa (RSmillion)</b>	<b>Revenues pa (RSmillion)</b>	<b>5 year Capex (RSmillion)</b>
Ahmadabad	318	223	1,189
Amritsar	224	172	212
Bangalore	3,414	4,255	1,918
Bhopal	283	100	21
Chandigarh	548	404	526
Chennai	1,388	3,127	17,343
Coimbatore	111	135	543
Indore	881	165	543
Jabalpur	104	62	200
Jamshedpur	328	532	188
Kolkata	1,229	260	2,954
Mathura	28	9	88
Mumbai	4,284	8,789	7,581
Nagpur	424	562	953
Nashik	215	182	809
Rajkot	149	92	792
Surat	368	N/A	N/A
Varanasi	183	141	65
Vijayawada	104	91	80
Visakhapatnam	412	525	1,667

The Water (Prevention and Control of Pollution) Cess (Amendment) Bill introduced in 2003 seeks to strengthen the financial resources of pollution control boards and promote water economy by factories. The tax was last increased in 1991, resulting in a rise in annual income from RS81.3million to RS637.8million in 2000. The new charges are expected to bring in around RS2billion a year. State Pollution Control Boards will receive 80% of tax revenues, with Delhi retaining the balance for the central pollution control agencies. The tax will be applicable to all industries, except hydropower and seeks to encourage water conservation.

### **Delhi's fundamental financial challenge**

Annual operating costs for the Delhi Jal Board (DJB) had gone up from RS2.76billion (USD61million) in 1998 to RS7billion (USD154.7million) by 2003. DJB has annual revenues of RS2.30billion (USD50.8million) and debts of RS36billion (USD795million) and RS16.2billion (USD357.8million) in interest liability. Legislation will be sought in order to establish a Delhi Water Regulatory Commission, the first such water structure to be formed in any Indian state. About 85% of water supplies serve residential consumers who pay RS0.53 (GBP0.006) per m<sup>3</sup>. As 75% of municipal connections are unmetered, there is a need to consider metering before tariff rationalisation can be implemented. The unregulated private sector thrives under these conditions in Delhi, with 1,200 private tankers charging RS100 (USD2.20) per m<sup>3</sup>. Although DJB will be corporatised, politicians have ruled out any material private sector involvement.

<b>Groundwater</b>	
<b>Total recharge (1998, km<sup>3</sup>)</b>	<b>350.00</b>
Per capita (1998, m <sup>3</sup> )	359
Withdrawals (1979, km <sup>3</sup> )	150.2
For domestic use (1979)	3%
For industry (1979)	1%
For agriculture (1979)	96%

### **The private sector and PSP**

The Eighth Five Year Plan aimed for expenditure for water and sanitation services to increase from 0.56% to 3.80% of total public sector expenditure, with a total public sector outlay on water supply and sanitation for urban areas of RS57.6billion. The total investment requirements for water supply

and sanitation based on various reports indicate that an investment of RS254.9billion is required for 100% coverage of urban water supply and sanitation. In consequence, there is a broad realisation that private sector financing and management is now needed in India. The average annual investment on O&M of urban water supply and sanitation systems has been estimated at RS23.87billion (for a population of 217million at RS110 per capita).

In 2002, the Tata Energy Research Institute recommended that the state of Gujarat considered some form of PSP in seeking to meet its RS8,600million spending needs for basic urban water supply. The institute believes that all PSP models are applicable under current state laws.

In 2003, the state government of Karnataka examined privatising urban drinking water supply and Jharkhand issued a notice seeking private investor participation of in water supply in Ranchi, Dhanbad, Chas, Mango and Adityapur towns.

#### **Bulk water provision projects proposed to date**

<b>City</b>	<b>Cost (RSmillion)</b>	<b>Type</b>	<b>Security</b>	<b>Status</b>
Bangalore, Karnakata	13,000	BOOT	State guarantee	Evaluation stage
Cochin	4,000	BOT	State guarantee	Abandoned
Hyderabad, Andhra Pradesh	5,000	BOOT	State guarantee	Abandoned
Panjum, Goa	3,000	BOOT	State guarantee	Re-evaluation
Pune, Maharashtra	7,500	BOT	Debt from state	Abandoned
Tirupur, Tamil Nadu	15,000	BOT	State guarantee	Operational
Chennai, Tamil Nadu	10,000	BOT	State guarantee	Evaluation stage

#### **Indian companies noted**

Fourteen water treatment, desalination and wastewater treatment contract awards to Indian companies have been identified, eleven of which are currently in operation.

#### **JUSCO: Projects stemming from the Jamshedpur contract**

JUSCO has been operating Jamshedpur's water and sewerage services since the city's inception. Four contract awards have been gained since 2007: Mysore (6 year management for rehabilitating water and wastewater services), Haldia (water treatment BOT), Jamshedpur (extension O&M contract) and Kolkata (industrial township water and effluent services BOT).

#### **VA Tech Wabag**

As well as short term post installation operating contracts and the IVRCL contract, VA Tech gained two sewage treatment contracts serving Chennai in 2006, serving a total of 600,000 people.

#### **IVRCL [1]: Alandur wastewater treatment**

First STP Private Ltd (95% held by IVRCL) is a JV with VA Tech Wabag. It is developing a 12,000m<sup>3</sup> per day (4.4million m<sup>3</sup> pa) WWTW at Perungudi for Alandur Municipality, where IVRCL has installed the underground sewerage system. The WWTW has been completed and the households need to be connected to the system by the municipality.

#### **IVRCL [2]: Chennai desalination**

In August 2005, IVRCL was made the preferred bidder for the RS5billion contract to build a 100million L/day water desalination plant for Chennai Metro Water Supply & Sewerage Board, and operate it for 25 years. This is India's first desalination project, the completion of which was delayed due funding and political issues.

#### **BHEL: Chennai WWTW**

In September 2003, BHEL gained a wastewater treatment construction and operations contract in Chennai. The RS364million (USD7.9million) contract was awarded by the Chennai Metropolitan

Water Supply and Sewerage Board (CMWSSB). Construction took 18 months, with the facility entering into service in 2005. BHEL will also look after Operation and Maintenance (O&M) of the plant for ten years, post commissioning. The sewage treatment plant will have its own power plant which will be run by biogas, generated within the facility, making it self-sufficient and lowering operating costs.

#### Larsen & Toubro: Visakhapatnam bulk water

In Andhra Pradesh, work has started on the Visakhapatnam Industrial Water Supply Project. This is a 55.5km pipeline from the River Godavari to augment the 153km Yeleru Left Bank Canal. Some 15% of the output is going to domestic consumers. These are subsidised by Visakhapatnam Municipal Corporation for three years, charging RS8 per m<sup>3</sup> against an actual cost of RS24 per m<sup>3</sup>. Larsen & Toubro has a 32 year concession for operating the pipeline, with equity financing from the municipality (Andhra Pradesh Industrial Infrastructure Corporation) and from the private sector; L&T Holdings and PSL Holdings, with a permitted return of 15% over the concession. Political changes in Andhra Pradesh may threaten the project.

#### Jindal Aquasource: 4 BOT and BOOT projects

Four BOT and BOOT projects have been gained between 2007 and 2010, including two for municipal wastewater treatment serving Rajkot and Bhavnagar.

#### Radius: Cancelled bulk water project

In 1998, Radius Water Company signed a 22 year BOT contract to deliver 4millionL of water a day to a 23km industrial belt along the Seonath River in Chattisgarh state. The state wishes to terminate the contract, which was signed two years before Chattisgarh became a separate state from Madhya Pradesh (*Source: GWR, 170, 2003*). Some RS250million has been spent by Radius Water to date, but it is alleged that water demand is materially below what had been expected. In April 2003, the state of Chattisgarh cancelled the concession.

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Agra	1,511,000	1,892,000	N/A
Ahmadabad	5,120,000	6,298,000	Considering private sector involvement
Allahbad	1,152,000	1,420,000	N/A
Asanol	1,257,000	1,584,000	N/A
Amristar	1,151,000	1,444,000	N/A
Aurangabad	1,048,000	1,336,000	N/A
Bangalore	6,462,000	7,939,000	One water treatment DBO
Bhopal	1,644,000	2,046,000	N/A
Bombay (Mumbai)	*18,336,000	22,645,000	Political opposition to private sector for now
Calcutta (Kolkata)	*14,299,000	16,798,000	Industrial township W & WW BOT
Chandigarth	*928,000	1,170,000	N/A
Coimbatore	1,618,000	2,005,000	N/A
Delhi	15,048,000	18,604,000	Water and wastewater treatment BOTs
Dhanbad	1,189,000	1,477,000	N/A
Durg-Bhilainagar	1,043,000	1,305,000	N/A
Faridabad	1,298,000	1,685,000	N/A
Ghaziabad	1,236,000	1,634,000	N/A
Guwahati	932,000	1,174,000	N/A
Gwalior	940,000	1,156,000	N/A
Hubli-Dharwad	855,000	1,054,000	N/A
Hyderabad	6,115,000	7,420,000	Bulk water scheme abandoned
Indore	1,913,000	2,413,000	N/A
Jabalpur	1,231,000	1,519,000	N/A
Jaipur	2,747,000	3,470,000	N/A
Jamshedpur	1,238,000	1,542,000	JUSCO (asset owning, privatised since onset)
Jodhpur	951,000	1,181,000	N/A
Kanpur	3,018,000	3,718,000	N/A
Kochi (Cochin)	1,463,000	1,785,000	Bulk water scheme abandoned

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Kozhikode (Calicut)	924,000	1,119,000	N/A
Lucknow	2,566,000	3,180,000	N/A
Ludhiana	1,571,000	1,954,000	N/A
Madras (Chennai)	*6,915,000	8,092,000	Desalination & wastewater treatment projects
Madurai	1,254,000	1,514,000	N/A
Meerut	1,328,000	1,662,000	N/A
Mysore	852,000	1,049,000	Management contract for W & WW
Nagpur	2,350,000	2,885,000	Various O&M and DBO projects
Nashik	1,381,000	1,769,000	N/A
Patna	2,029,000	2,578,000	N/A
Pune (Poona)	4,409,000	5,524,000	Bulk water scheme abandoned
Rajkot	1,185,000	1,513,000	Wastewater treatment BOT
Ranchi	989,000	1,247,000	N/A
Solapur	1,002,000	1,263,000	N/A
Srinagar	1,087,000	1,353,000	N/A
Surat	3,557,000	4,623,000	N/A
Thiruvananthapuram	926,000	1,118,000	N/A
Tiruchchiripalli	915,000	1,123,000	N/A
Vadodara	1,675,000	2,077,000	N/A
Varanasi (Benares)	1,303,000	1,589,000	N/A
Vijayawada	1,094,000	1,341,000	N/A
Viskhatnam	1,465,000	1,804,000	Bulk water transfer

### International contract awards

#### Degrémont: Delhi wastewater treatment DBO

Degrémont gained a 10 year DBO for a 136,500m<sup>3</sup> per day wastewater treatment plant serving Delhi in 2008, entering service in 2010-11 and will be operated for 10 years by Degrémont in a EUR27million contract. The treated effluent will be used for agricultural irrigation.

#### Degrémont: Bangalore water treatment DBO

A 600,000m<sup>3</sup> per day plant will be built to augment the city's 400,000m<sup>3</sup> per day facility, serving 3million people and will enter service in 2012.

#### United Utilities: Tirupur bulk water BOT

The Tirupur project is now in operation. The USD220million BOT (including USD140million in construction cost) water scheme, first proposed in 1994, aims to deliver 0.185million m<sup>3</sup> per day, two-thirds of which will go to supply about 1,000 Tirupur textile mills, the rest to domestic customers supplied through the municipal corporation. Industrial customers will pay RS45 per m<sup>3</sup> and domestic customers RS5 per m<sup>3</sup>, replacing around 400 water tankers. The BOT is being operated by Mahindra Realty and Infrastructure Developers Ltd of India, and United Utilities International, with funding from a USD222million rupee-denominated debt and equity package. In 2009, ownership of the project was vested to Manila Water (Philippines) and the Indian companies.

#### Degrémont: Chennai water O&M

Degrémont was awarded a contract for the construction of the 530,000 m<sup>3</sup>/day of drinking water treatment plant serving 4million people for the Chennai Metro Water Supply and Sewerage Board in July 2005. The total cost of EUR25.2million is being financed with EUR6.6million from a French State protocol and EUR18.7million from the Tamil Nadu Urban Finance and Infrastructure Development Corporation. This is India's largest water treatment works and the first to be fully operated by Suez. The operating contract runs from 2007-14.

**Veolia: joint venture with Doshion**

Veolia has been actively seeking to enter the Indian water contract market since the mid 1990s. The company entered into a joint venture with Doshion, an Indian water engineering company with revenues of USD50million in 2007. Doshian Veolia Water Solutions (70% Doshian, 30% Veolia Water) was formed in 2008 to provide a more effective market entry strategy.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Tirupur	30 year bulk water BOT	Manila Water (Philippines)
Delhi	10 year wastewater treatment BOT	Degrémont
Visakhapatnam	32 year bulk water concession	Larsen & Toubro
Bangalore	2&7 year water DBO	Degrémont
Alandur	10 year WWTW BOT	First STP
Chennai	10 year WWTW BOT	BHEL
Chennai	25 year desalination BOT	Chennai Water Desal
Chennai	7 year water treatment O&M	Degrémont
Chennai	10 year wastewater DBO	VA Tech Wabag
Chennai	10 year wastewater DBO	VA Tech Wabag
Kolkata	30 year BOT	JUSCO
Jamshedpur	Asset owning	JUSCO
Jamshedpur	4 year O&M	JUSCO
Haldia	25 year BOT	JUSCO
Mysore	6 year water services management	JUSCO
Nagpur	5 year water O&M	VE
Nagpur	15 year water DBO	VE
Lodhika	30 year wastewater BOOT	Jindal Aquasource
Bhavnagar	30 year wastewater BOOT	Jindal Aquasource

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
UUI	United Utilities (UK)	600,000	0	<b>600,000</b>
Degrémont	SE (France)	7,000,000	600,000	<b>7,600,000</b>
VE	VE (France)	750,000	0	<b>750,000</b>
Larsen & Toubro	Larsen & Toubro (India)	500,000	0	<b>500,000</b>
First STP	IVRCL (India)	0	100,000	<b>100,000</b>
Chennai Water Desal	IVRCL (India)	1,000,000	0	<b>1,000,000</b>
BHEL	BHEL (India)	0	100,000	<b>100,000</b>
VA Tech Wabag	VA Tech Wabag (India)	0	600,000	<b>600,000</b>
JUSCO	Tata Steel (India)	1,830,000	1,330,000	<b>1,830,000</b>
Jindal Aquasource	Jindal Group (India)	0	700,000	<b>700,000</b>

Sources:

*ADB (2007) 2007 Benchmarking and Data Book of Water Utilities of India. Ministry of Urban Development, ADB, Manila*

*Munjee, N. (2000). Privatisation of water & sewerage projects in India. Presentation to IBC, Financing of Water & Sewerage Projects, IMB, London*

*Narain, S (2002). Water & Wastewater International, 17 (2), 27-28*

*Global Water Report 185, December 2003, pp 103*

*Global Water Report 191, March 2004, p5*

**INDONESIA**

<b>Economics (2008)</b>	
GNI per capita	USD1,880
GNI per capita (PPP)	USD3,600
Agriculture	14%
Industry	48%
Services	37%

**Water resources and degradation**

Indonesia has abundant water resources along with rapid urbanisation and a minimal water provision and sewerage infrastructure. Water supplies to cities have been affected by catchment degradation, conflicts between urban and agricultural use, untreated sewage and the lack of regulation of the discharge of industrial effluents.

**Effluent discharge into river systems**

<b>(mt/yr, 1993)</b>	<b>Volume</b>	<b>BOD</b>
Industry	900	1,349
Domestic	1,653	517
Total	2,533	1866

While there are significant groundwater resources available for urban areas, there is no reliable data as to how compromised these have been by excess abstraction, saline ingress and excreta contamination.

<b>Population</b>	
Total 2009 (million)	230.0
Total 2020 (million)	255.9
Urbanisation in 2008	51.5%
Urbanisation by 2020	62.6%
Urbanisation by 2050	79.4%

**Urban water services**

Less than 50% of the population has access to safe water, falling to 30-50% in urban areas. Sewerage facilities serve only 5% of the urban population. 30% of urban households had direct access to water in 2004. There are 306 PDAMs (municipal water utilities), 60% serving less than 10,000 customers. Of samples taken in 1990, 40% showed contamination. Average distribution losses are 40%. Tariffs typically cover 70% of operating costs. Indonesia had 37% non-revenue water in 2004.

The 2009 targets for urban and rural water supply coverage are 66% (from 41% in 2004) and 30% (from 8% in 2004), to serve 45.8million and 27.3million people, respectively. Of the total 318 PDAMs (water companies) in the country, 44 are considered financially healthy while 164 need financial help.

<b>Urban Data (2008)</b>	
With improved drinking water	89%
With household drinking water	37%
With improved sewerage	67%
With household sewerage (2004)	2%
With 2 <sup>o</sup> sewage treatment	1%

**Politics and environmental legislation**

Prior to 1992, there was no functional national water policy. The Ministry of Public Works and the provincial governments are meant to be responsible for water laws. Two general water related Acts have been passed but these are seen as having little practical value. These are the Act of the Republic of Indonesia No 4 of 1982, concerning basic provision for the management of the living



environment, and the Government Regulation of the Republic of Indonesia No 20 of 1990, concerning the control of water pollution.

Environmental issues are now covered by Bapedal (Environmental Impact Management Agency), which is a non-ministerial government agency, reporting directly to the President. A programme to control the pollution of 24 main rivers in 1989 failed because there was no effective monitoring, while regulations concerning industrial effluent discharges are non-enforceable.

The 1995-99 Repilita VI (Sixth Five Year Plan) allocated USD1.38billion to urban and rural water provision, with the aim of reducing distribution losses to 25% for large towns/cities and 30% for medium and small towns. Water provision is to be improved for 22million people in urban areas, with 30,000 L/sec (946million m<sup>3</sup> pa) and 20,000 villages being connected, reaching 16.5million people in rural areas. With the exception of projects that have involved the private sector, economic and political factors are understood to have militated against these plans.

In 1999, the anti-corruption law, Law 28/1999, was passed. This law provides the legal basis for the anti-corruption commission to require public officials in sensitive positions to declare their assets prior to assuming their posts and to agree to have their assets open to an official audit during and after their term. The Government has also formed several working groups to draft a presidential decree on improved procurement procedures designed to improve the implementation of public projects.

The Ministry of Settlement and Infrastructure's water resource bill was passed in March 2004. It seeks to operate with water supplies regarded as a commercial good.

The 2004 New Water Resources Law is designed to improve water provision from its current state where 30% of the urban population have tap water, 30% of municipal water entities (PDAMs) do not employ an accountant and 70% of them are facing serious debt difficulties. Legislation passed in 2006 aims to allow PDAMs to restructure their debts and to seek full cost recovery through tariffs. The Medium Term Development Plan for 2005-09 aimed to develop infrastructure through improved operational efficiency and PSP. Progress is held back by local politicians opposing tariff reform and using extant PDAM revenues for unrelated projects (ADB, 2007).

### Water requirements

USD3billion has been spent on urban water supply projects since 1970, but much of this money has been misappropriated. In 2001, water production was 91,000 L/sec.

Bulk water sales (L/sec)	1990	2010
Household taps	16,331	99,000
Public taps	916	4,000
Non domestic	7,008	83,000
Total sales	24,255	186,000
Available supply	52,000	248,000
Distribution losses	53%	25%

Indonesia's proximate water provision needs have been estimated as requiring USD7.8billion, with the majority of funding for medium and large cities coming from international agencies (for example the IFC and ADB) and the private sector. In the mid 1990s, the Government aimed for 80% of its urban population to have piped water at the household level by 2000. Likewise, in 1997, the Government stated that it sought to have 85-100% of households connected to suitable sanitation services by 2003 against 52% in 1996. Neither target has been met. The Government is currently seeking USD4billion for current projects. The current rates of sewerage network development would reach the 85% target in 90 years, at a cost of RS3trillion.

### Sewage treatment coverage

City	Connections	% coverage
Bandung	90,000	20%
Cireon	18,800	32%
Jakarta	2,300	3%
Medan	7,400	2%

Surakarta	8,000	13%
Tangerang	9,800	4%
Yogyakarta	10,100	10%

Source: Indonesia: Overview of Sanitation and Sewerage Experience and Policy Options; EASUR, World Bank, 2002.

Currently, sewerage services access 0.49million people in Jakarta. In total, 0.7million m<sup>3</sup> of effluent is discharged into the river network per day. Currently, just 3% of the city's sewage is treated, or a total of 210,000 people. Golden Grid (New South Wales and Sydney Water) is seeking to develop a 25 year BOT. Currently 9% of the population has no facilities and 6% use communal blocks.

Until the 2001 Water Pollution Control Regulation, wastewater from households was not defined as a water pollutant. Subsequently, municipalities have been made responsible for managing it.

Freshwater	
Annual availability (2007)	2,838 km <sup>3</sup>
Per capita (2008)	12,483m <sup>3</sup>
Annual withdrawal (2007)	3%
Domestic (2007)	8%
Industrial (2007)	1%
Agriculture (2007)	91%

### Politics and PSP

Water PSP was at first mooted to pay government debts as well as to alleviate water provision and pollution problems. In 1994-95, there was a belief that water and sewerage were not in the end going to undertake PSP, but severe flooding in Jakarta during 1996 brought matters to a head.

Some 27-30 BOT contracts have been under consideration since 1996. In general, these have been advancing slowly. Deregulation started to take place in 1994-95, after Government Regulation No. 20 opened the water sector to private investors. International companies are expected to carry out all necessary consulting and fieldwork before any proposals are submitted. To date, six BOT and concession awards have been made. The rate of progress has been slowed by political change, but it is anticipated that up to 10 more project awards can be expected to be made in the next five years. Currently, bulk water projects for Palembang, Bandung, Surabaya, Ujungpandang and Manado are being prepared for offer to the private sector. A total investment of USD314million is needed for these projects.

Groundwater	
Total recharge (1998, km <sup>3</sup> )	226.0
Per capita (1998, m <sup>3</sup> )	1,094

MAJOR CITIES			
Population	2005	2015	Status
Jakarta	13,215,000	16,822,000	Water services PPP (two sectors)
Bandung	4,126,000	5,338,000	Under consideration since 2003
Surabaya	2,735,000	3,453,000	Under consideration since 1994
Medan	2,287,000	2,981,000	Bulk water provision PPP
Ujung Pandang	1,284,000	1,688,000	N/A
Palembang	1,733,000	2,270,000	N/A
Malang	964,000	1,273,000	N/A
Badar Lampung	915,000	1,595,000	N/A
Semerang	967,000	1,273,000	Under consideration
Tegal	933,000	1,233,000	N/A

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Jakarta (East)	PSP of water provision services	Acquatico
Jakarta (West)	PSP of water provision services	Suez
Medan	25 year water supply BOT	Suez

Sidoarjo	25 year water supply BOT	VE
Talang Kepala	20 year water concession	Cascal
Batam Island	25 year water concession	Cascal

<b>Indonesia – Local projects</b>			
<b>Project</b>	<b>Operator</b>	<b>Population</b>	<b>Comments</b>
Jambi	PT Noviantana	427,500	25 year water BOOT, 1998
Serang Timur	PT Sarana Tirta Rejeki	N/A	25 year water BOT, 1997
Kota Legenda	PT Purta Alvita	N/A	25 year water BOT, 1995
Kaw Industri Hundai	PT Aristirta Tarumba	N/A	25 year industrial water BOT, 1994
Cikarang Baru (Kab. Beksai)	PT Graha Buana Cikarang	N/A	25 year water BOT, 1994
Serang Utara	PT Sauh Bahtera	N/A	25 year water BOO, 1993
Kemang Patama (Kab. Beksai)	PT Kemang Patama	N/A	25 year water BOT, 1993
Bali Water Supply Project	PT Tirta Arta Buana Mulia	N/A	20 year water Greenfield BOT, 1992

Source: Castalia (2004) Sector Note on Water Supply and Sanitation for Infrastructure in East Asia and the Pacific Flagship, Review by Castalia for the World Bank, ADB and JIBC

### City Study: Jakarta

Water and sewerage services are administered by Persuahaan Air Minuum Dki Jakarta (Pam Jaya), which in turn awarded 25 year water supply concessions to RWE/Thames (East Jakarta) and Suez (West Jakarta) in 1997. The contracts became operational in January 1998. In 1993, the city area's population of 8,350,000 was served by 320,000 connections, with water available for 19 hours per day. All connected properties were metered, with distribution losses of 54%. The main water networks were constructed in the 1940s. Spending on infrastructure had collapsed in the 1960s as the Suharto regime diverted assets away from public spending. In 1993, 30% of the population received water supplies directly from Pam Jaya and 16% via public taps. Private wells and vendors supply the rest of the population.

Under the 1997 PSP plans, connections were set to rise to 70% by 2002, with all supplied by 2022, with 80% paying for these services. By 2002, the actual connection rate was only 50%. Even so, progress has concentrated upon low earning households:

<b>Household connections</b>	<b>1997</b>	<b>2002</b>
<b>Total</b>	<b>505,000</b>	<b>610,000</b>
Low income houses	25,500	59,230

Because of the effects of Suharto's downfall and the Asian financial crisis in 1998, agreement on price rises has been deferred in exchange for capital spending deferrals. Suez has sought to extend its initial investment period from 5 to 10 years. PT PAM Lyonnaise Jaya has repaired 241km of pipes, reducing leakage from 65% to 52%, along with 230 miles of new pipes. The aim is to increase the customer base by 10% pa from the current level of 2.4million.

Rates were increased in 1998 by 20%, 35% in 2001, 40% in 2003 and by 30% in 2004. A cross-subsidy system continues to be applied. By 2002, there were still approximately 40,000 illegal connections, due to water being provided by corrupt staff. Distribution losses had been reduced from 60% in 1997 to 49% by 2002. In return for the new rate increases, a stricter reporting regime will be put into place, along with new leakage reduction targets.

To date, RWE has invested USD46million in the East Jakarta concession and Suez at least USD50million with the West Jakarta concession. However, water delivery in terms of quality and quantity appears to have failed to improve in the intended manner. This is partly due to the poor quality of water available to the concession companies and in part because of financial constraints imposed by inflation since 1997. It is understood that RWE has been losing USD1million a month for about two years, due to the delays in the tariff rebasing procedure.

<b>Private sector company operations</b> (Please see the relevant company entry for details)					
<b>Company</b>	<b>Parent company</b>	<b>Population served</b>			
		<b>(country)</b>	<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Lyonnaisse des Eaux	SE (France)		5,000,000	0	<b>5,000,000</b>
Acquatico	Acquatico (Indonesia)		2,850,000	0	<b>2,850,000</b>
Generale des Eaux	VE (France)		100,000	0	<b>100,000</b>
Cascal	Sembcorp (Singapore)		1,030,000	0	<b>1,030,000</b>

#### Distribution losses in the main cities

<b>PDAM</b>	<b>Location/Province</b>	<b>Leakage</b>
JAYA	Jakarta	45%
Kodya Bandung	West Java	45%
Kodya Semarang	Central Java	39%
Kodya Kediri	East Java	26%
Tirta Marta	Yogyakarta	32%
Halmahera Tengah	Maluku	35%
Tirta Monpase	North Aceh	40%
Tirta Musi	Palembang, South Sumatra	37%

#### Major urban water authorities

<b>PDAM</b>	<b>Population</b>	<b>Connections</b>	<b>Population covered</b>
PAM DKI JAYA, Jakarta	9,696,000	610,000	33%
Kota Surabaya, East Java	2,864,100	256,637	45%
Kota Bandung, West Java	2,613,292	141,435	28%
Kota Semarang, Central Java	1,415,400	118,099	42%
Kota Bogor, West Java	673,880	47,495	36%
Tirta Marta, DI Yogyakarta	483,862	32,702	34%
Nota Manado, North Sulawesi	441,900	31,666	36%
Kodya Denpasar, Bali	390,410	49,208	63%
Kota Cirebon, West Java	297,397	50,019	85%
Kota Salatiga, Central Java	144,483	17,995	63%
Kota Magelang	123,000	18,757	77%
Kota Pare-Pare, South Sulawesi	115,900	10,926	48%

#### Sources:

ADB (1999). *Good governance and anticorruption: the road forward for Indonesia*. Asian Development Bank, Consultative Group on Indonesia, July 1999

ADB – APDF (2007) *Asian Water Development Outlook 2007: Country Paper – Indonesia*, ADB, Manila

Seshagiri, G.V. (2001). *Asia Water*, 17 (11) p 6-10

'The riddle of Jakarta' *GWJ*, September 2004, pp 21-23

**JAPAN**

<b>Economics (2008)</b>	
GNI per capita	USD38,130
GNI per capita (PPP)	USD35,190
GDP in Agriculture	1%
GDP in Industry	29%
GDP in Services	70%

**Legislation and management**

Water management is guided by the 1958 Water Works Act (amended 2001). The Water Pollution Control Law passed in 1960 allows for the monitoring of and enforcement of standards relating to the discharge and treatment of household and industrial effluents. The Basic Environment Law passed in 1993, defines government responsibilities and overall aims for environmental protection, which were incorporated into the 1994 Basic Environment Plan. This plan sets out a series of targets for water and effluent treatment and the expansion and upgrading of Japan's sewerage and sewage treatment network. The Law for the Preservation of Drinking Water Supply Quality in Headwaters was passed in 1994. The Japanese Environment Agency is mainly concerned with pollution monitoring and carrying out research work. In 1995, domestic water tariffs accounted for 90.2% of service provision costs. In theory, water services to agriculture are self financing, but the payments do not cover all actual costs, with sewerage fees accounting on average for only 60% of costs.

Water and sewerage services turnover in 2000 was JPY5,600billion (USD45billion), with capital spending of JPY6,500billion (USD52billion) making Japan the largest water market in the world. This implies that there is a deficit of USD7billion per annum purely in capital spending terms. An average bill of USD360 per capita also implies that there is significant scope for efficiency gains.

<b>Population</b>	
2009 (million)	127.2
2020 (million)	126.7
Urbanisation in 2008	66.5%
Urbanisation by 2020	69.4%
Urbanisation by 2050	80.1%

**Water supply entities**

Size of System	Number	People served
500,000+	21	39,720,000
100,000-500,000	183	37,850,000
20,000-100,000	613	26,230,000
5,000-20,000	1,131	11,200,000
Below 5,000	9,370	6,650,000

Water supply entity	Number
Public	11,127
Private (100+ people)	3,784
Bulk water	110

In addition, there are 4,760 sewerage and sewage treatment systems, ranging from river basin systems to rural schemes.

<b>Urban Data (2008)</b>	
With improved drinking water	100%
With household drinking water	99%
With improved sewerage	100%
With household sewerage	N/A
With 2 <sup>o</sup> sewage treatment	75%

**Sewage treatment development**

Year	1984	1987	1990	1996
Tertiary	0%	0%	2%	8%
Secondary	30%	36%	42%	50%
Primary	9%	0%	0%	0%

**Infrastructure development**

Nationally, 95.5% of people are connected to piped water supply. The low level of sewerage in Japan (54% in 1995) marks the country from the rest of the industrialised world. In the 13 major cities, 96% were connected to sewerage, compared with 42% for the rest of Japan. Septic tanks for example, remained commonplace in Tokyo until the 1980s. As much of the water and sewerage network has been developed since the 1960s, it is generally in good condition.

	1978	1988	1993
Flush lavatories	46%	66%	76%
Sewerage	31%	39%	47%

The 8<sup>th</sup> Five Year Plan for Sewerage Construction ran from 1996 to 2000, and aimed to lay the foundations for a modern sewerage and sewage treatment infrastructure.

	1995	2000	2010
Connected to sewerage	54%	66%	90%
Effluents recycled	27%	35%	60%
Tertiary treatment	4%	12%	90%

By 2006, sewerage coverage was 69% with a target of 72% for 2007. Capital spending on sewerage in recent years has averaged JPY3,400billion pa (USD2.7billion), 60% of sewerage and 30% on wastewater treatment works. The water supply extension programme has been budgeted at JPY1,900billion. When including industrial effluents, 62% of wastewater was treated in 1995.

65% of sewerage and sewage treatment capital spending is eligible for central Government subsidies; at a rate of 50% for sewerage and 55% for sewage treatment works.

<b>Sewage system development in 2006</b>		
	JPY billion	USD billion
Total project cost	2,283	19.0
Eligible for subsidy	1,480	12.3
Subsidies paid	786	6.6

Sewer charges covered 197.9% of O+M costs in 2004, but this falls to 55.8% after accounting for the cost of bond redemptions. Average sewerage charges are less than those for water because of the impact of the capex subsidies.

Charge (2000)	JPY per 20 m <sup>3</sup>
Water	3,083
Sewerage	2,442

**Development of sewerage in Tokyo (a BOD of 5.0 or below is the acceptable standard)**

	Connected to sewerage	River water quality (BOD)
1971	46%	22.0
1975	63%	9.7
1981	77%	6.7
1985	83%	6.5
1991	96%	5.4
1995	100%	5.0
2001	100%	5.0
2006	100%	4.9

<b>Freshwater</b>	
Annual availability (2007)	430km <sup>3</sup>
Per capita (2008)	3,367m <sup>3</sup>
Annual withdrawal (2007)	21%
Domestic (2007)	20%
Industrial (2007)	18%
Agriculture (2007)	62%

### Environmental and service shortfalls

Since 1995, Tokyo has been experiencing water shortages both in late summer and during the winter. This is due to inadequate water storage and distribution facilities in the region.

<b>River water quality</b>	<b>1989</b>	<b>1991</b>	<b>1996</b>
Good-Fair	69%	75%	74%

In 1997, bathing and coastal waters were at their lowest quality since the 1970s, with a fall in the quality of lakes also noted. Eutrophication in service reservoirs has affected drinking water supplied to 14million people in recent years.

<b>Groundwater</b>	
Annual availability (1998)	185.0km <sup>3</sup>
Per capita	1,469m <sup>3</sup>
Annual withdrawal (1990)	13km <sup>3</sup>
Domestic (1987)	29%
Industrial (1987)	41%
Agriculture (1987)	30%

### PSP and private sector players

The traditional resistance towards privatising Japan's water or sewerage services and its reticence towards foreign companies is being eroded by the country's mounting debt problems and the need to make water and sewerage services cover their costs. Another factor has been the lack of impact that Japanese companies have, in consequence, made in the PSP of water and sewerage services globally. The only cases where they have been noted are as equity partners in extant consortia. For example, Mitsubishi holds 5% of the United Utilities consortium serving eastern Manila and is AWG partner for the Beijing No 10 water BOT. Marubeni also has a JV with VE for a variety of projects in China and other East Asian economies. Marubeni is Vivendi's JV partner for the Chengdu BOT water supply project in China. Mitsui and Sumitomo both have a 7.5% stake in Thames Water's Izmit project in Turkey.

While all urban water and sewerage services are in municipal hands, a degree of O&M outsourcing for sewage treatment works has been in place since 1953. It is not managed by the private sector in the conventional sense, but through a series of one year management outsourcing contracts. The sewage treatment O&M market was worth USD4billion pa in 1997, of which USD1billion pa was operated by private sector operators.

### Market breakdown for sewage treatment O&M in public and river basin sewage systems

Municipal operators	38%
Ebara	10%
Nihon HELS Industry	21%
Other private operators	31%

According to industry sources in Japan, this market is expected to grow by 50% in the medium term.

Since 1999 three developments have made the rest of the sector more attractive to the private sector. In 1999, legislation was passed allowing the use of private finance in water and sewerage projects, although to date this has in reality been limited to the use of PFI projects for their design and build capabilities. In 2000, legislation was introduced to encourage the consolidation of water and



sewerage entities to improve their cost effectiveness. This has subsequently evolved to allow one city to operate another city's services. In 2001, guidelines were introduced to encourage multi year O&M contracts at sewage treatment works. In consequence, strategic alliances are being developed in anticipation of the opening up of the rest of the Japanese market:

Japan Water	Nihon HELS/Mitsubishi
J-Team	Ebara/Nippon Jogesuido Sekki Co
Hitachi Public Services	Hitachi
Marubeni Vivendi	Marubeni/Veolia
Thames Water Japan	RWE/Mitsui

There is much more private sector involvement in industrial water services than for municipal water services. Sumitomo Metal has been operating a 155,000m<sup>3</sup> per day industrial WTP at Wakayama since 2002.

A 5.5 year O&M contract for Geihoku, a town of 3,000 people is the first medium term PSP contract in Japan. Geihoku's nine water supply systems are now operated by J-Team, a venture between Ebara and Nippon Jogesuido Sekkei (NJS) a water consultant. In November 2002, Japan Water, a 50:50 JV between Mitsubishi and Nihon HELS, Japan's largest sewage treatment operations company, won the first O&M contract for water services for the city of Miyoshi (population 40,000). Japan Water operated the city's water treatment and distribution infrastructure for 5.5 years. This contract have since been renewed.

In Saitama prefecture to the north of Tokyo, the local government currently supplies 2.5million m<sup>3</sup> per day of treated bulk water and some industrial water. Due to budget constraints, the prefecture chose to contract out the operation of a new 150,000m<sup>3</sup> per day WTP. Japan's most comprehensive PSP scheme to date is currently under consideration. The city of Wakayama to the south of Osaka has commissioned a feasibility study to replace three old plants with a new 92,000m<sup>3</sup> per day facility at a cost of JPY24billion (USD205million). In addition, the renewal of a sludge treatment line at the Okubo WWTP will be implemented in the form of a 20-year BOT contract.

In August 2006, Veolia Water gained two three year wastewater treatment management contracts, the first in Saitama Prefecture, near Tokyo (52,000m<sup>3</sup> per day), and the second in Hiroshima (247,000m<sup>3</sup> per day). These contracts cover almost a million people and will generate a total of EUR23million. These are the first management contracts to be awarded to international players. In April 2007, VE gained a three year O&M contract for a 283,000m<sup>3</sup>/day wastewater treatment plant serving 500,000 people in Chiba, which will generate total revenues of EUR17.8million.

In July 2007, Veolia Water Japan and J-Power (Japan's Electric Power Development Co) acquired Fresh Water Miike, a water management unit of Mitsui Mining Co. This company, now named Fresh Water Service Co provides water services for half of the households in Omuta, Fukuoka Prefecture and the neighbouring Arao in Kumamoto Prefecture.

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Tokyo	35,197,000	35,494,000	Wastewater O&M
Osaka	11,268,000	11,309,000	N/A
Nagoya	3,179,000	3,202,000	N/A
Kitakyushu	2,800,000	2,830,000	N/A
Sapporo	2,508,000	2,539,000	N/A
Kyoto	1,805,000	1,805,000	N/A
Hiroshima	2,044,000	2,045,000	Wastewater O&M
Sendai	2,224,000	2,240,000	N/A

Sources:

ADB – APDF (2007) *Asian Water Development Outlook 2007: Country Paper – Japan*, ADB, Manila

Ministry of Environment, Web Site

Testar, J.T. (2002). *Asian Water* 18 (5), 7-9

*Japan edges towards PSP. Global Water Intelligence, July 2002, pp10-13*

*PSP in Japan. Global Water Intelligence, September 2003, pp14-15*

**KAZAKHSTAN REPUBLIC**

<b>Economics (2008)</b>	
GNI per capita	USD6,160
GNI per capita (PPP)	USD9,720
Agriculture	6%
Industry	43%
Services	51%

**Water resources**

Total water resources in an average year are estimated at 100.5km<sup>3</sup> with 46km<sup>3</sup> suitable for use. There is an average shortage of 6.6km<sup>3</sup> pa, rising to 18.3km<sup>3</sup> in a drought year. Water use has been falling since 1991 (36.91km<sup>3</sup>) with the move from Soviet-led cotton irrigation projects to a more sustainable agricultural policy. In consequence, the 1996 level of usage was 32.72km<sup>3</sup>. In terms of seasonal and geographical availability, water remains a severe constraint on development.

<b>Population</b>	
Total 2009 (million)	15.6
Total 2020 (million)	16.6
Urbanisation in 2008	57.9%
Urbanisation by 2020	62.3%
Urbanisation by 2050	75.9%

**Water pollution**

Effluent discharges of polluted water into rivers fell from 0.34km<sup>3</sup> pa in 1991 to 0.23-0.24km<sup>3</sup> in 1993-95. Total wastewater discharges in 1994 were 6.04km<sup>3</sup>, with 5% from domestic sources, 24% from agriculture and 71% from industry. Of the 10 main river basins in 1996, one (Ural) was classified as extremely polluted (Grade 7), one (Ertys) as highly polluted (Grade 6), one (Satysu) as polluted (Grade 5), one (Nura) as rather polluted (Grade 4), three (Syr-Darya, Ili and Karatal) as moderately polluted (Grade 3) and three (Shu and Talas) as clean (Grade 2).

The Aral Sea is arguably the greatest global environmental catastrophe to date. Its problems are described in the country entry on Uzbekistan.

As for groundwater, 15.86km<sup>3</sup> is assessed as suitable for use, including 10.80km<sup>3</sup> of brackish water, for industrial use. Groundwater pollution from mineral extraction, industry and petrochemicals is widespread.

<b>Urban Data (2008)</b>	
With improved drinking water	99%
With household drinking water	82%
With improved sewerage	97%
With household sewerage (2004)	78%
With 2 <sup>0</sup> sewage treatment	50%

**Political responses**

The Ministry of Ecology and Natural Resources has drawn up a series of priority projects for 1998-2000, along with a long-term plan for 1998-2030. Planning is carried out within the National Environmental Action Plan for Sustainable Development of the Republic of Kazakhstan (NEAP/SD). The Water Code of the Republic of Kazakhstan was introduced in 2003, setting water charging schemes and water and effluent treatment standards. The Association of Vodokanals (the 46 water utilities) are also regulated by the 2004 Law on Water Supply and Drainage.

Almaty is having a USD800million upgrade of its water supply system, 70% of which is in poor condition. This includes KZT30billion (USD240million) on a 55km ring main due to be completed by 2010. Urban water tariffs range from KZT20-41/m<sup>3</sup>. Between 2002 and 2006, Central Government allocations for water services were KZT36.4billion, with Local Government providing a further KZT18.6billion.

**Drinking Water Branch Program spending / budget**

Period	KZTbillion	USDmillion
2002-04	33.2	266
2005	17.7	142
2006-10	255.3	2,040

<b>Freshwater</b>	
Annual availability (2007)	75 km <sup>3</sup>
Per capita (2008)	4,812 m <sup>3</sup>
Annual withdrawal (2007)	46%
Domestic (2007)	2%
Industrial (2007)	17%
Agriculture (2007)	81%

**Urban water services**

Per capita water use in urban areas ranges from 25-500L/day (Almaty 251L/day) against a range of 15-320L/day in rural areas. 18.6% of urban drinking water samples taken in 1994 failed on hygiene grounds.

Water coverage for the five major cities is generally good, ranging between 76% and 100%, with 24 hour availability where covered. Sewerage coverage ranges from 38% to 98%. Outside Almaty (NRW of 10%), non revenue water ranges from 29-35%. O&M costs are broadly met in these cities by water revenue charges.

According to the draft State Programme on Poverty Reduction for 2003-2005, 75% of the population is connected to a water network. The use of alternative sources is increasing; between 1997 and 1998 alone, the percentage of people using decentralized sources increased from 16 to 23%, in part due to 22% of water pipelines not functioning. Between 1990 and 1997 the proportion of piped water failing water quality standards rose from 9% to 26% and approximately 50% of the population drinks water that fails salinity and hardness standards. In rural areas about 9% of the population have access to piped water.

<b>Groundwater</b>	
<b>Total recharge (1998, km<sup>3</sup>)</b>	<b>35.87</b>
Per capita (1998, m <sup>3</sup> )	2,133
Withdrawals (1996, km <sup>3</sup> )	3.91
For domestic use (1996)	58%
For industry (1996)	28%
For agriculture (1996)	14%

**Private sector involvement**

Since 1993, the Government has sought to encourage international investment along with PSP proposals. The World Bank (Kazakhstan joined the IFC in 1993) provided USD16.5million out of USD20.9million for initiating the long term upgrading of the city of Atyrau's Vodocanal water and sewerage systems in June 1999. Kazakhstan's environmental legacy and its low population density have limited private sector investment to date, except where it is related to the petrochemical industry. Both the Asian Development Bank and the European Bank for Reconstruction and Development are active in the country, concentrating on financial institutions and the petrochemicals industry

<b>MAJOR CITIES</b>			
Population	2005	2015	Status
Almaty	1,156,000	1,183,000	Partial PSP in some suburbs

**Cascal's activities in Almaty**

In 1998, Biwater (Cascal) was awarded a five year O&M contract for water and sewerage services in the Kaselen suburbs of Almaty. During the first year of the contract, there was major improvement in

service quality, with water provision going from 4-6 hours per day to a 24 hour service. Billing was only introduced once the water provision service was seen to have improved. A 25% collection rate has been improved to 90%, partly since the police services are involved in the procedure. The contract is now profitable on an operating basis and Cascal has an option to buy the suburb's water company at a nominal price.

### VE enters Almaty and Astana and leaves Almaty

VE was awarded two contracts in March 2000: (1) A 30 year water management contract for Almaty has yet to start due to contractual problems. (2) A USD40million contract for 51km water pipeline and pumping station renovation for the new capital Astana (population 320,000, to grow to 690,000 by 2020).

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Kaselen (Almaty)	O&M for water management	Cascal
Astana	Water management	VE

### Japanese aid for Astana

In 2003, the Japan Bank for International Cooperation signed a loan agreement for JPY21,361billion (USD180million) with the government of Kazakhstan to develop Astana's water supply and sewerage systems.

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Cascal	Sembcorp (Singapore)	N/A	0	N/A
VE	VE (France)	N/A	0	N/A

Source:

ADB – APDF (2007) *Asian Water Development Outlook 2007: Country Paper – Kazakhstan*, ADB, Manila

**MALAYSIA**

<b>Economics (2008)</b>	
GNI per capita	USD7,250
GNI per capita (PPP)	USD13,740
Agriculture (2007)	10%
Industry (2007)	48%
Services (2007)	42%

**Water and sewerage provision**

(million)	1990	%	2000	%
Urban	9.17	96%	12.65	99%
Rural	5.93	67%	7.33	87%
Total	15.10	80%	22.20	92%
Leakage		43%		37%
Sewerage		42%		79%

In 1994, 5% of the population had secondary treatment and 5% primary treatment, with access to some form of sanitation having risen from 70% in 1980 to 94%. During that period, access to potable water actually fell from 80% to 78%. This reflects a period of rapid population growth and urbanisation, whereby resources were fully committed towards keeping up with developments in urban areas, along with the higher relative cost of installing piped water compared with basic sanitation measures.

<b>Population</b>	
Total 2009 (million)	27.5
Total 2020 (million)	31.5
Urbanisation in 2008	70.4%
Urbanisation by 2020	78.5%
Urbanisation by 2050	87.9%

**River quality and pollution**

Industrial development and urbanisation, allied with a minimal sewage treatment infrastructure has resulted in a dramatic deterioration in river water quality in recent years. In consequence, a number of rivers are now unsuitable as sources of drinking water and are affecting further development.

<b>Quality by river</b>	<b>1987</b>	<b>1996</b>
Clean	49%	28%
Polluted	47%	43%
Very polluted	3%	29%

By 1998, only 25% of rivers were classed as clean. Domestic sewage accounted for 65% of the BOD load, agricultural effluent 27% and industry 8%. Johor is regarded as the state with the most polluted rivers, followed by Penang and Pahang. In recent years, data on inland water quality has been volatile. Thus an improvement between 1994 and 1995 has been countered by a significant deterioration since 1995. It is likely that this is in part accounted for by the assessments being based on overall river quality, thus making year-on-year comparisons more volatile.

<b>Urban Data (2008)</b>	
With improved drinking water	100%
With household drinking water	99%
With improved sewerage	96%
With household sewerage (2004)	41%
With 2 <sup>o</sup> sewage treatment	16%

## Regulatory framework

Malaysia's framework legislation is laid out in the Environmental Quality Act, 1974 (127, Amendment A953 in 1996), which outlines the Ministry of the Environment's powers and objectives. Specific legislation includes the Waters Act, 1989 (418) and the Sewerage Services Act, 1993 (508).

## Government, planning and PPP

The traditional role of the Government, via the Public Works Department (PWD), is the supply of funding and planning of water projects in the states. Individual states are supposed to levy fees which pay for basic O&M, with all extra work funded by central government. This used to be in the form of grants, now it has been turned into 0% interest loans. Loans are approved by the Federal Government. The Government has much experience of working with the private sector for evaluating problems and projects, especially in the use of external consultants. Tariff charges are decided by state governments.

The Government thus now regards water and sewerage as a commercial area. Its PSP or commercialisation has to be approved through economic planning units. Until 2004, no open bids took place and thus came through private sector proposals, with no competitive bidding. This is how Indah Water gained its nation-wide sewerage contract.

In 2005, the Federal Government assumed joint responsibility with the state Governments for the overall management of water services in Malaysia. The National Water Services Commission (NWSC) Act and Water Services Industry Act (WSIA) were also passed as a framework of legislation for the sector based upon corporatizing the state held and operated services, along with setting up the Water Asset Management Company (WAMCO) as a government agency to hold the Facility License under the WSIA and facilitate the process of transformation into the new water supply industry regime.

Current treatment capacity of 10,730MLD is adequate for current demand, but needs to be expanded to meet future growth, with 62 water resource projects earmarked for 2000-50. Water consumption in Malaysia grew by 8% a year between 1981 and 2001 because of population growth, industrialisation and urbanisation and is forecast to rise by an estimated 4% a year until 2010.

Water demand	MLD
2000	9,655
2020	20,338
2050	31,628

Malaysia is to spend RM50billion (USD3.2billion) on upgrading water and sewage services between 2005 and 2010. At the same time, a systematic approach to the award of PSP contracts is to be adopted. This is in response to the ad hoc manner in which previous contracts have been awarded. It is unclear how extant contracts would be affected. This means that new contracts such as the proposals in Selangor and Sabah are unlikely to be awarded until an independent regulator is established and a suitable tendering process is in place.

## Planned capital spending on water only, 2000-50

Period	MLDmillion
2000-10	22,180
2011-20	15,421
2021-30	6,921
2031-40	6,371
2041-50	1,220
Total	<b>51,933</b>

Internal freshwater resources	
Annual availability (2007)	580km <sup>3</sup>
Per capita (2008)	21,470m <sup>3</sup>
Annual withdrawal (2007)	1.6%
Domestic (2007)	62%
Industrial (2007)	21%

Agriculture (2007)	17%
--------------------	-----

### PSP and priorities

Malaysia prefers full concession awards, wherever possible, allied with long concession periods, with 20-60 years being usual practice. Regulation is to be agreed upon within the terms of the individual contract, with government input with respect to health and environmental matters dealt with on an ongoing basis.

Making water bills commercial remains a sensitive issue, as demonstrated by the political fallout over revising sewerage tariffs after PSP. Pressure for PSP in water services at the state government level is coming from the need to recover increased costs. Typically, states sell about 35% to 40% of the water produced. Metering is common for all household connections, but there have been a number of problems with the reading of meters. Low water prices mean that there is little illegal abstraction. Water tariffs in Malaysia will be increased from RM0.50 per m<sup>3</sup> (EUR0.14) in 2002 to RM1.49 (EUR0.42) by 2006 and to RM2.25 (EUR0.62) by 2011. Tariffs are amongst the lowest in South East Asia, and cannot cover costs as 8 out of 17 state water providers ran a deficit in 1998. For example, the Selangor Government spends RM1billion (EUR300million) on operational costs and collects RM200million (EUR60million) from consumers. These costs are set to rise in order to cover investments in "analytical instruments and monitoring systems" as a result of a stricter standards laid down in the Safe Drinking Water Act.

During the 1970s, 19 master plans were unveiled in order to implement the National Sewerage Development Programme. By 1990, only nine of these had even been partly implemented because of limited funds. In consequence, the 1993 Sewerage Services Act was passed in accordance with the National PSP Policy, to mobilise funds and management.

According to Dr Lim Keng Yaik, the Minister of Energy, Water and Communications, in January 2006 the Suruhanjaya Perkhidmatan Air Negara (SPAN / National Water Services Commission, NWSC) will explicitly support PSP through creating a suitable regulatory background for investment. All State held (through the Water Asset Holding Co) water companies will eventually be corporatised and owned by the various state governments, which will then decide whether they want to continue with their concession agreements or float their shares on Bursa Malaysia. Current concessions, such as in Johor and Selangor, should be for their respective state governments to decide whether they want to continue with the concession agreements. The Minister intends to use the model used by the Penang Water Supply Corporation, in being listed on Bursa Malaysia. The proposed Water Assets Holding Company, will be a business entity owned by the Finance Ministry and run as a full-cost-recovery company over a span of 40-50 years.

Access to sanitation	1970	1980	1990
Household sewerage	3%	4%	5%
Septic tank	17%	22%	37%
Flush latrine	3%	30%	45%
Other latrines	59%	26%	6%
None	18%	16%	6%

Malaysia's sewerage is covered by the previously privately operated Indah Water Konsortium (IWK). IWK has found that it is much harder to force people to pay for sewerage as part of bills than it is to force them to pay for water. It remains usual to have the sewerage component as a top up on the water bill. The State Water Authority cannot compel the customer to pay the sewerage component of the bill. IWK had debts of RM700million by 2000. The government took it over for RM200million.



**Water supply operating expenditure and revenues in 2005 (RMmillion)**

State	Expenditure	Revenues	Net result
Kedah	129.0	163.1	+34.1
Sarawak [1]	36.6	25.4	-11.3
Labuan	18.0	11.0	-7.0
Perlis	18.6	12.8	-5.8
Pahang	149.1	103.8	-45.3
N Sembilan	114.4	163.5	+49.1
Sabah	295.3	255.8	-39.4
Perak	185.5	231.5	+46.0
Kuching (Sarawak)	61.6	75.6	+14.1
Sibu (Sarawak)	24.0	24.0	0.0
Malaka	113.2	115.8	+2.6
LAKU (Sarawak)	44.7	53.2	+8.5
SATU (Terengganu)	81.8	80.8	-1.0
Selangor [2]	1,510.9	1,417.6	-93.3
Johor	460.7	610.1	+149.3
Kelantan	42.7	57.6	+14.8
Pulau Pinang	129.8	163.1	+34.1

[1] Excluding LAKU, Kuching and Sibu

[2] Excluding Kuala Lumpur and Putrajaya

The private sector continues to encounter problems with low tariffs and poor tariff collection. In 2001, private sector expenditure was RM2.76billion while revenue was RM2.23billion. In 2003, the Federal Government announced that it is to take over the management and financing of water supply projects from the country's states, after some states revealed they were having cash flow problems relating to their infrastructure work. In Selangor, the state owns private water companies and contractors some RM3.9billion.

The sector is currently undergoing a proposed restructuring, which was meant to have been completed in 2008-09 but remains at a developmental stage in 2010. The principle behind this programme is to impose a national holding company for the state utilities in order to manage their debts. The emphasis here is on local companies and management, with Malaysian companies always controlling a majority of any PSP venture.

In 2010 there were 54 water operators in Malaysia, 35 private sector and 19 public sector. In addition there are 184 wastewater operators, the 'vast majority' being private, although the main service remains under public control.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	71.0
Per capita (1998, m <sup>3</sup> )	3,310
Withdrawals (1993, km <sup>3</sup> )	0.4
For domestic use (1993)	50%

<b>MAJOR CITIES</b>			
Population	2005	2015	Status
Kuala Lumpur	1,405,000	1,696,000	Bulk water PPP

**Water contract type by state in 2007**

PWD – Division of the Public Works Department

WWD – Waterworks Department

WB – Water Board

Corp – Corporatised bodies

PSP – Private sector participation

State	Population	Type	Comments
Kedah	1,800,000	PWD	One water supply concession
Labuan	85,000	PWD	N/A
Perlis	215,000	PWD	One concession
Pahang	1,400,000	WWD	N/A
N Sembilan	1,000,000	Corp	One O&M contract for part of the state
Sabah	3,400,000	WWD	N/A
Perak	2,260,000	WB	Two contracts for part of the state
Sarawak	2,100,000	PWD	N/A
Kuching (Sarawak)	N/A	WB	N/A
Sibu (Sarawak)	N/A	Corp	N/A
LAKU (Sarawak)	N/A	Corp	N/A
Melaka	2,100,000	Corp	One concession for part of the state
SATU (Terengganu)	1,150,000	Corp	N/A
Selangor	7,000,000	PSP	Four major contracts
Johor	3,300,000	PSP	Concession
Kelantan	2,100,000	PSP	Concession
Pulau Pinang	1,500,000	PSP	Partial divestiture

Partially revised using company presentations and 'Malaysia's new-look water sector' (GWI, June 2009, p26).

### Contracts by type noted in 2007

#### Divestiture

Penang (PBA 45% / State 55%)

#### Full Concession

Johor (SAJ),

Kelantan (Air Kelantan)

#### BOT, BOOT etc

Selangor: SSP2 Puncak Niaga, SSP3 SPLASH

Sabah: JETAMA, TIMATCH, Lahat Datu

Perak: MUC, Innovest Lyonnaise

Johore: Equiventures

#### Management Contracts

Puncak Niaga, ABASS, SPLASH, Taliworks,

Air Utara, Encorp Utilities, Southern Water

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Johor-Barhu	BOT contract, water supply	Suez
Kota-Kinabalu	BOT contract, water supply	
Perak	BOT contract, water supply	Suez
Ipoh, Perak	Concession, water supply	Intan Utilities
Selangor (SYBASS)	Concession, water supply	Puncak Niaga
Selangor (SPLASH)	Concession, water supply	SPLASH
Selangor (ABASS)	Concession, water supply	ABASS
Selangor (PN)	Concession, water supply	Puncak Niaga
Malacca	Concession, water supply	VE
Johor	O&M/Concession, water	SAJ Holdings
Kertih	20 year industrial water outsourcing	VE
Penang	Partial divestiture	PBA
Kedah	Concession, water supply	Taliworks
Pewrlis	Concession, water supply	Taliworks
National contracts	Industrial effluent treatment	Eco Water
Negeri Sembilan	10 year water distribution	Salcon O&M

### City Study: Kuala Lumpur

Water provision is managed by the Selangor Waterworks Department. The central area of the city has a population of 1.145million, all of which are served by a total of 0.675million connections. Metering is commonplace. In 1993, the average domestic tariff was USD0.327 per m<sup>3</sup>, compared with a cost of water production of USD0.627 per m<sup>3</sup>. In consequence, cross subsidies come from domestic and industrial water users paying more than the economic cost. Water quality is considered to be fair, with the treatment capacity in 1993 covering only 39% of water produced for the city. Another problem is low water pressure. 25% of the city is currently covered by a sewerage system, with the rest using septic tanks. Treatment of effluents is understood to be minimal.

As a result, there has been a gradual PSP of water and sewerage services for the city since 1993. Sewerage has been taken over by Indah Water, which in turn is gradually developing a network of sewage treatment works. Bulk water provision comes in part from the PSP of Selangor's water services to Puncak Niaga and Veolia. There has been a shift in shareholdings and management towards the Malaysian companies since 2000.

### Conflict Study: Raw water supplies to Singapore

A series of agreements drawn up between Singapore and Malaysia from 1927 to 1990 set out terms for the provision of bulk water from Johor to Singapore until up to 2061. These tariffs have become the subject of a dispute initiated by Malaysia. The water infrastructure has been developed by Singapore, which is also responsible for its operational costs. Under the 1961 agreement, Malaysia supplies Singapore with raw water at RM0.03 per 1,000 gallons and Singapore in turn supplies Malaysia with treated water at RM0.50 per 1,000 gallons at a rate whereby both tariffs are effectively cancelled out.

Malaysia is currently proposing that from 2011 it will provide Singapore with treated water (from the facilities developed by Singapore) at a cost put at RM0.45-0.60 per 1,000 gallons in 2000-01, rising to RM3.00-8.00 during 2002, before negotiations broke down. The state of Johor aims to become self sufficient for treated water, thereby decoupling the import/export element of the original agreement. Singapore is currently reducing its dependence on imported water from Malaysia through demand management, catchment development, wastewater reclamation ('NEWater') and desalination and is considering becoming self sufficient in water resources by 2061.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
CGE Utilities	VE (France)	600,000	0	600,000
Ondeo	Suez (France)	1,565,000	0	1,565,000
Intan Utilities	Intan Utilities (Malaysia)	600,000	0	600,000
Puncak Niaga	Puncak Niaga (Malaysia)	7,300,000	0	7,300,000
Taliworks	Tailworks Bhd (Malaysia)	1,500,000	0	1,500,000
PBA Bhd	PBA Bhd (Malaysia)	1,580,000	0	1,580,000
SAJ	Ranhill Bhd (Malaysia)	3,800,000	0	3,800,000
Eco Water	Eco Water (Malaysia)	N/A	N/A	N/A
SPLASH	KPS (Malaysia)	0	0	0
Salcon	Salcon (Malaysia)	500,000	0	500,000

#### Sources:

Keong, L M (2002). *Asia Water*, 18 (2), p 8-11

Malaysian Water Association: *Malaysia Water Industry Guide 2002*

Malaysia's big moment. *GWI*, March 2004, pp 19-21

Companies fear curbs in new bills. *GWR* 240, April 2006

MWAMC (2007) *Financial Initiatives For Water Industry Reform. Presentation by Malaysia's Water Asset Management Company at Water Malaysia 2007, Kuala Lumpur, May 2007*

Yew L K (2010) *Reforming the water sector in Malaysia. Speech to the GWI global water summit, April 2010. Transforming the world of water, GWI, Oxford, UK*

**MEXICO**

<b>Economics (2008)</b>	
GNI per capita	USD9,990
GNI per capita (PPP)	USD14,340
GDP in Agriculture	4%
GDP in Industry	37%
GDP in Services	59%

**Regulation and national plans**

The National Commission for Water (Conagua) is responsible for developing and enforcing a series of five year water plans. The current plan (PROMMA) ran from 2001-2006 and aimed to provide potable water to 89% of the population with 65% of household wastewater being treated. The Commission for Water and Drainage for Metropolitan Areas is responsible for water and sewerage management in urban areas. The major laws are the General Law on Environmental Protection (1988 and revised in 1996), and the National Water Law (1992 and supplemented by the 1994 Regulations for the National Water Law). The Ministry for Social Development has imposed taxes for effluent discharges. The National Water Law also introduced the concept of tradable water rights.

**The 2001-06 National Water Plan:**

	<b>2001 Actual</b>	<b>2002 Actual</b>	<b>2006 Plan</b>
% connected to piped water	88%	88%	89%
% connected to sewerage	76%	77%	78%
Wastewater treated [1]	23%	28%	41%
Water & pollution permit compliance	7%	26%	100%
Levies, fees & taxes (MXN million)	6,150	6,337	7,094

[1] The original PNH 2006 wastewater target was 65%.

[Source: PNH 2006, in OECD (2003) OECD Environmental Performance Review: Mexico]

<b>Inland water quality</b>	<b>2000</b>
Good	5%
Fair	22%
Poor	49%
Bad	24%

25% of the country's surface has adequate water supplies, which enjoy 82% of the rainfall. Most of the population lives in the arid areas. According to the Environment Minister in 2001, Mexico has 60% less water per capita than 50 years ago, 73% of its supply is contaminated and 93% of its rivers are polluted.

<b>Population</b>	
Total 2009 (million)	109.6
Total 2020 (million)	124.7
Urbanisation in 2008	77.2%
Urbanisation by 2020	80.7%
Urbanisation by 2050	87.6%

**Water provision and public health**

In Mexico City, water connections were 92% (64% indoors) and access to sanitation was 90% with 68% having access to flush lavatories. By 1995, water and sewerage connections were 98% and 94% respectively.

**Urban water and wastewater services**

	1990	1995	2000	2005	2008
Piped water	78%	85%	88%	89%	90%
Sanitation	62%	72%	76%	86%	86%
Sewage treatment	N/A	25%	24%	N/A	N/A

*Federman, D K (2009) National actions in Mexico. Presentation to 2009 World Water Week, Stockholm, Sweden, August 2009.*

Under Mexico's Standard NOM-001-ECOL-1996, all 139 municipalities with more than 50,000 people and industrial sites with a BOD5/suspended solids generation of more than 3t/day are meant to have appropriate wastewater treatment by 2000. As of 2002, 24% of the population was connected to a sewerage system, with 27% of sewage collected being treated at 978 WWTWs, with 11% being treated to primary standard and 16% to secondary standard. Meanwhile, 5.4km<sup>3</sup> pa of industrial wastewater is generated, with 15% treated (34% primary, 62% secondary & 4% tertiary) at 1,405 WWTWs, but only 503 operating in compliance with national standards.

**Effluent treatment, 1994-1999**

(m <sup>3</sup> /second)	1994	1998	1999
Effluent discharge	261	291	320
Installed cap	42	63	67
Operating cap	32	41	42
Effective cap	14	29	N/A
Effluent treated (%)	12	14	13

A water treatment programme was started in 320 municipalities in 1991 to reduce the risk of cholera. This involved 95% of municipal piped drinking water being chlorinated along with the prohibition of the discharge of untreated sewage effluents for market gardening. Only 30% of drinking water is fully treated. 225 out of 1,018 regional water treatment plants were in need of repair in 2001. Distribution losses are between 40-48%.

<b>Urban Data (2008)</b>	
With improved drinking water	96%
With household drinking water	92%
With improved sewerage	90%
With household sewerage (2004)	80%
With 2 <sup>o</sup> sewage treatment	5%

**Investments and service plans**

Current income at USD1,503million pa accounts for 42% of required financial resources. Money and management are at a premium. One challenge for municipal performance is that authorities typically last three years and water managers just two. Thus there is little management or political continuity. In addition, high levels of debt and the inability to generate cash for loan repayments meant that just 21 states and six municipal water works met the Mexico's Federal loan criteria in 2003. The International Monetary Fund is disbursing USD1billion in loans for water and sewerage projects, with USD1.4billion being allocated to water and sanitation projects by the Ministry of Cities and total Government spending set to be in the region of USD1.66billion, compared with USD800million in 2003.

In 2010, Conagua the national water authority announced that water sector projects with private sector finance and operations worth up to USD2.77billion were under development, USD1.85billion of them earmarked for 2010. Likewise, the development bank Banobras anticipates investing USD4billion in the water sector between 2010 and 2012 on behalf of the bank and private investors.

USDmillion	2001-06	2007-12	2013-25
Capex	11,911	10,131	20,184
Opex	9,487	10,644	25,562
<b>Total</b>	<b>21,398</b>	<b>20,775</b>	<b>46,796</b>
<b>Total – annualised</b>	<b>3,566</b>	<b>3,463</b>	<b>3,900</b>

Various estimates point towards USD58-89billion being required over a 25 year period to achieve universal and sustainable access to water and sanitation. While total spending has been boosted to USD2.2billion pa since 2003, it is evident that further investment is needed.

	2000	2025 BAU	2025 SG
Urban unaccounted for water	44%	44%	24%
Drinking water service coverage	88%	88%	97%
Sewerage service coverage	76%	76%	97%
Wastewater treated	23%	60%	90%
Investment (MXNbillion pa)	14	16	30

BAU = Business As Usual Scenario, SG = Sustainable Growth Scenario

Source: PNH 2006, in OECD (2003) OECD Environmental Performance Review: Mexico

### Goals for the National Water Commission (2001-2006)

Measure	2001	2004	2006 Goal
Population with potable water service	88%	89.4%	89%
Population with sewerage service	76%	77.4%	78%
Rural areas with potable water service	69%	71%	71%
Volume of wastewater treated as % of wastewater collected	25%	31.1%	46%
Verification of wastewater quality discharges to ensure compliance with NOM-ECOL-001-1996	10%	96.7%	100%
River basin councils functioning autonomously	1	16	25
Autonomous Technical groundwater committees	4	41	41
Number of inhabitants protected against floods (1000's)	364	3,371	1697
Amount collected for water rights and fines (Million EUR)	478	581	610

Source: CNA, 2005

A series of measures to help preserve water supplies has been launched in a move that could help Mexico pay its Rio Grande river water debt to the USA under the 1944 treaty. A deal reached by U.S. and Mexican Governments earlier in 2003 said the two countries will invest in water conservation measures and mandates the modernisation of the water infrastructure, aiming to achieve greater efficiency in water use. Mexico also sought to boost the amount of treated and reused wastewater from one-third of output to two-thirds by 2006.

Other challenges stem from Mexican politics and their several legacies. Since the 2000 elections ended 71 years of rule by the Institutional Revolutionary Party, there has been a piecemeal transition from a centralised state to one with more local decision making, but without an effective transfer of operations. While in constitutional terms, water belongs to the state, this does not allow for the economic and environmental opportunity costs involved when water is transferred from one state to another or to Mexico City. Meanwhile, up to half of users do not pay for the service, health regulations stipulate that at least a minimal supply must be maintained to domestic non-payers.

Internal freshwater resources	
Annual availability (2007)	409km <sup>3</sup>
Per capita (2008)	3,846m <sup>3</sup>
Annual withdrawal (2007)	19.1%
Domestic (2007)	17%
Industrial (2007)	5%
Agriculture (2007)	78%

## Politics and PSP

Mexico has a long tradition of private sector water contracts. Concessions were awarded in Puebla, Saltillo and Monterrey in 1855, 1899 and 1904 respectively. In the 1920s there were 20 concessions in operation. Since the 1940s, these were taken over by the state. PSP in Mexico was revived in the wake of the 1992 National Water Law. At the same time, Federal support for water and sewerage services in the provinces was eased to encourage the commercialisation of the services. After strong progress between 1992 and 1994, economic problems have meant that progress in subsequent years has been piecemeal.

Many of the current generation of PSP contracts were awarded shortly before the 1994 Peso crisis, which caused problems with regards to the quality of earnings in hard currency terms. Contracts such as Biwater's sewage treatment BOT in Puerto Vallarta have suffered from the inability of anticipated tariff increases to be imposed. Companies such as Biwater have concentrated on working within new financial constraints to deliver high service quality with the longer term in mind. 50 wastewater treatment BOT contracts were awarded up to the end of 1999. In 2001, twelve were operational (with a PE of 6million), while 20 have been cancelled and twelve are under re-negotiation.

Azurix entered the market in 1999 by buying out private sector stakes in two concessions. Azurix's activities were sold to Suez in 2002. Likewise VE has gradually increased its holding in its Omsa JV from 33% in 1993 to 50% by 1998. From 2003, the Government aims to award concessions for 180 cities with a population over 50,000. This will cover water treatment and provision services, with 49%, 51% and 100% stakes being available. In reality, five BOT contracts awards were identified in 2003 and a further four in the year to date. Even so, a marked increase in local companies bidding for contracts points towards healthier conditions than for some time.

<b>Groundwater</b>	
Annual availability (1998)	139.0km <sup>3</sup>
Per capita	1,450m <sup>3</sup>
Annual withdrawal (1985)	24.0km <sup>3</sup>
Domestic	13.2%
Industrial	23.0%
Agriculture	63.8%

## Privatising sewage treatment

Private sector involvement is also being sought for wastewater treatment. 16% of Mexico's sewage treatment capacity is handled by the private sector, involving a total investment of USD400million (the 1999 figures are Government estimates).

<b>Sewage treatment in Mexico, 1994-99</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999*</b>
Effluent discharge (m <sup>3</sup> /s)	261	272	277	284	291	320
Installed treatment capacity (m <sup>3</sup> /s)	42	48	51	57	63	67
Operating treatment capacity-nominal (m <sup>3</sup> /s)	32	41	33	39	41	42
Operating treatment capacity-adequate (m <sup>3</sup> /s)	14	17	20	25	29	N/A
Effluent treated (%)	12	15	12	13	14	13
Treatment operating adequately (%)	33	35	39	44	46	N/A

Between 2000 and 2005, the level of wastewater treatment in Mexico rose from 23% to 36%. This was due to MXN1.4billion (USD1.08billion) in wastewater treatment plants over the period, 38% from the federal government and state and 46% from municipal authorities, with the private sector providing 16% of the costs. The aim in 2005 was to increase sewage treatment to 42% by 2009.

Conagua is seeking for all of Mexico's wastewater to be treated by 2012 through a combination of municipal, state and federal funding and management, along with financing from the private sector to make up needed amount. 19million m<sup>3</sup> per day of wastewater was discharged in 2007, of which 36% was treated. 3.5million m<sup>3</sup> per day of wastewater is collected in Mexico Valley (Mexico City and 18 surrounding cities in Mexico state), where treatment facilities are severely lacking. To reach full treatment over the next six years, the number of treatment plants in the country would need to nearly double, adding 1,500 plants to the 1,600 plants currently in operation.



<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Ciudad Juárez	1,540,000	2,008,000	N/A
Culiacán	812,000	931,000	N/A
Guadalajara	3,968,000	4,456,000	N/A
Leon de los Alta	1,481,000	1,785,000	Sewage BOT
Mérida	939,000	1,097,000	N/A
Mexicali	860,000	1,015,000	N/A
Mexico City	19,411,000	21,568,000	Four water management contracts awarded
Monterrey	3,596,000	4,140,000	N/A
Puebla de Zarago	1,824,000	1,861,000	Water and sewerage PSP
Querétaro	947,000	1,185,000	N/A
San Luis Potosi	946,000	1,103,000	N/A
Tijuana	1,649,000	2,194,000	N/A
Toluca	1,5457,000	1,770,000	N/A
Torreon	1,072,000	1,200,000	N/A

### **Case study: Siapa**

Guadalajara's municipal utility Sistema Intermunicipal para los Servicios de Agua Potable y Alcantarillado (Siapa) plans to spend USD700million on improving water and wastewater services over the next 25 years. This will cover drinking water and wastewater management for the 3million people in Guadalajara, Zapopan, Tlaquepaque and Tonalá. Water will be brought from Lake Chapala, leakage will be reduced and seven WWTPs will be built. Support will come from the Japanese Government and the Inter-American Development Bank. In addition, the municipality's investment grade debt rating will be used to mobilise new debt when cash flow allows.

Siapa provides drinking water to 93% of the Guadalajara region and wastewater services to 89%. It had revenues of MXN1.5billion (USD140million) in 2002 and is profitable, with a steadily improving debt profile. Finances have been improved by adopting fixed tariffs to avoid metering abuse and charging for wastewater services. Siapa spent USD50million in 2002 implementing a plan to measure water leakage in order to control and improve water pressure.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Aguascalientes	30 year water and sewerage concession	Caasa (Omsa)
Cancun	30 year water and sewerage concession	DHC
Chihuahua	10 year sewage treatment BOT	Atltech (Cygsa)
Culiacan	Sewage treatment facility concession	TECSA
León	Sewage treatment work BOT	Suez
Matamoros	Industrial effluent treatment BOT	Suez
NE Mexico City	10 year water management contract	Industrias del Agua
NW Mexico City	10 year water management contract	Servicios de Agua Potable (Omsa)
Pemex	4 industrial WWTW plants for Pemex	CYDSA
Puebla	Sewage treatment facility concession	TECSA
Puebla	Water and sewerage concession	Omsa
Puerto Vallarta	15 year sewage treatment BOT	CTAPV
Saltillo	25 year water and sewerage concession	Empresa Paramunicipal
SE Mexico City	10 year water management contract	Tecnología y Servicios del Agua
SW Mexico City	10 year water management contract	Agua de Mexico
Torreón	Sewage lagoon BOT	Suez
Xalapa	Water & sewerage DBFO	Atltec
Orizaba	Water & sewerage DBFO	Atltec
Atotonilco (Mexico City)	Wastewater DBFO	Atltec / Acciona Agua / IDEAL
Agua Prieta	Wastewater DBFO	Atltec
El Ahogado	Wastewater DBFO	Atltec
Morelia	Water & sewerage BOT	Aquasol
Pachuca	Water & sewerage BOT	Aquasol
San Luis Potosí	Wastewater BOT	Degrémont/Suez

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
CTPAV	Sembcorp (Singapore)	0	300,000	<b>300,000</b>
Industrias del Aguas	SE (France)	2,000,000	0	<b>2,000,000</b>
DHC	SE (France)	430,000	430,000	<b>430,000</b>
Suez	SE (France)	0	2,100,000	<b>2,100,000</b>
Omsa	VE (France)	5,980,000	3,450,000	<b>5,980,000</b>
Agua de Mexico	United Utilities (UK)	2,000,000	0	<b>2,000,000</b>
T y S del Agua (TECSA)	SE (France)	2,800,000	0	<b>2,800,000</b>
Aguas de Cancun	SE (France)	383,000	383,000	<b>383,000</b>
CYDSA	CYDSA (Mexico)	N/A	N/A	<b>N/A</b>
Empresa Paramunicipal	Agbar (Spain)	650,000	650,000	<b>650,000</b>
Atltec	Mitsui (Japan)	400,000	16,500,000	<b>16,500,000</b>
Aquasol	Aquasol (Mexico)	0	500,000	<b>500,000</b>

Sources:

*Mexico Water Report (2006) Submission for the 4<sup>th</sup> World Water Forum, Mexico City, Mexico*

*OECD (2003) OECD Environmental Performance Review: Mexico. OECD, Paris, France*

*World Bank (2002). Private Solutions for Infrastructure In Mexico. Country Framework Report for Private Participation in Infrastructure. World Bank and Public-Private Infrastructure Advisory Facility*

**NEPAL****Water resources**

In general, water availability is good, with 8.02% of available resources being abstracted in 1995. While coverage in rural areas has improved from 1.58million (11%) in 1980 to 6.95million (38%) in 1990 and 10.70million (60%) by 1994, continued urbanisation has resulted in a fall in coverage in urban areas from 0.71million (80%) in 1980 to 1.20million (75%) in 1990 and 1.33million (64%) by 1994. There are no recognised sewerage facilities.

**Water management**

Water policy is overseen by the Ministry of Water Resources and the Department of Water Supply and Sewerage. Water and sewerage services in urban areas are operated by the Nepal Water Supply and Sanitation Corporation (NWSSC). In rural areas, including Kathmandu Valley, water projects are carried out at the village level, with financial and technical assistance from the Asian Development Bank and various international aid organisations. The NWSSC is regarded as being seriously under funded, and is therefore having problems in maintaining its current assets, let alone expanding them. Pro Public (an environmental and human rights NGO) has brought a number of cases against the NWSSC demanding improved accountability, the elimination of alleged corrupt practices and the effective implementation of the 1992 Water Resources Act, which sets standards for drinking water quality that to date have not been met. In August 1999, a case at the Supreme Court brought by Pro Public, resulted in a ruling demanding that Nepal's Ministry of Environment set national standards for sewage and effluent levels in water. This ruling follows an earlier decision commanding the Government to ensure that sewage is treated prior to discharge into the two main rivers that flow through the Kathmandu Valley. The 1997 Environment Protection Act makes the Government responsible for setting acceptable pollution reduction targets.

The NWSSC operates in the urban areas of the Kathmandu Valley, providing water to 85% of urban areas (140,934 connections), but only 20% of urban areas are connected to its sewerage network. Total water demand in the valley is estimated at 160 MI/day and growing at 6% per annum, but water production varies between 90-130MI/day according to the season. 24 hour supply is understood to be the exception, alongside distribution losses of 30-40% and a bill collection rate of 70%. The USD464million Melamchi Water Supply Project is intended to augment supplies by 0.27million m<sup>3</sup> per day by 2009 but has been delayed by the Maoist insurgency in the Melamchi River area.

**PSP in the Kathmandu Valley**

Since 1997, the World Bank has been encouraging the Government of Nepal to consider proposals for the award of a ten year management lease contract for water and sewerage services for the Kathmandu Valley. The award process was revived during 2001 alongside two acts designed to enable PSP to take place. The Drinking Water Supply Act and the Drinking Water Monitoring and Tariff Fixation Commission Act were passed in 2002.

In 2003, the Asian Development Bank (ADB) gave a USD1.4million technical assistance grant to support water and sanitation sector reform in the Kathmandu Valley, including the establishment of the National Water Supply Regulatory Board (NWSRB) and the Kathmandu Valley Water Authority, and a private sector participation scheme, this time based on an O&M contract. Japan has also provided a grant of JPY927million (USD7.57million) for improvements to the water supply system in the Kathmandu Valley. A six year, extendible O&M contract, linked to USD100million in capital spending and USD15million in loans from the ADB was prepared for the end of 2004. Five international companies expressed interest in the proposal against one for the 2002 proposal. In September 2005, it emerged that Severn Trent Water gained the Kathmandu contract, as the sole bidder after three other pre-qualified companies (Gelsenwasser, SAUR and Cascal) withdrew their bids. The project subsequently went on ice again. The project for serving 1.5million people in the Kathmandu valley was due to proceed again in 2008, after the Asian Development Bank (ADB) approved lower costs from USD464million to USD317.3million. The ADB will provide a loan of USD137million for the project, with the Government of Nepal contributing USD90.6million. Again, the PSP status is unclear.

*Sources:*

*Global Water Intelligence, October 2001, pp 10-11*

*Asian Water, March 2004, pp 10-13*

**NEW ZEALAND**

<b>Economics (2008)</b>	
GNI per capita	USD27,830
GNI per capita (PPP)	USD25,200
GDP in Agriculture (2004)	6%
GDP in Industry (2004)	26%
GDP in Services (2004)	68%

**Legislation**

The Resource Management Act 1991 emphasises the intrinsic values of ecosystem biodiversity and quality as a central component in water management, with the emphasis changing from multiple-use management to environmentally sustainable management. The Ministries of Health and the Environment produce water quality guidelines and standards, with the former responsible for monitoring drinking water supplies. The Sustainable Land Management Strategy, adopted by the Government in 1996 has concentrated on agricultural impacts on water quality. The allocation of water and groundwater management systems is the current area of government concern.

<b>Population</b>	
Total 2009 (million)	4.3
Total 2020 (million)	4.4
Urbanisation in 2008	86.6%
Urbanisation by 2020	88.1%
Urbanisation by 2050	92.0%

**Inland water quality**

The Puppu Springs on the South Island have been described as possibly the clearest freshwater in the world. Their vertical clarity has been surpassed only at a few sites in Antarctic sea waters.

Good	40%
Fair/Poor	40%
Bad	20%

10-40% of New Zealand's lakes suffer from some degree of eutrophication. More than 90% of the eutrophic lakes are in the North Island and these are usually linked to agricultural run-offs.

**Water Resources and Water Rights**

According to the New Zealand Business Council for Sustainable Development, a significant proportion of the water rights as currently allocated will be fully used by 2012. However, between 20% and 80% of water already allocated for commercial use is not being used at any one time, having been allocated on a first-come, first-served basis. In the decade to 2007, 6% of water rights were transferred, reflecting the difficulties of transferring water entitlements under the 1991 Resource Management Act. Allowing 12-22% of water rights to more easily be transferred where they can be more effectively used would generate NZD180-330million pa.

*Source: Aqualinc Research Ltd (2008) Sustainable Freshwater Management – Towards an Improved New Zealand Approach, Prepared for the New Zealand Business Council for Sustainable Development, August 2008*

**Water provision**

There are 1,638 community drinking water supplies, serving 85% of the population. Of these, 7% (serving 54% of the population) are considered safe, while a further 2% (serving 5% of the population) are of borderline safety. However, 19% (serving 18% of the population) have an unsatisfactorily high risk of contamination. The remaining 71% of water supplies (serving 8% of the population) have not been graded because they are in communities of less than 500 people. Approximately 15% of the population are not connected to community supplies.

Until the mid 1990s, demand for water was increasing steadily throughout New Zealand. From 1970 to 1990 the amount used by people in Wellington and Auckland increased by 25% and 32% respectively. Since the Auckland water crisis of 1993, and the adoption of water conservation strategies, Auckland's water use has reverted to early 1980s levels or around 300L per day, 21% down on the 1988 figure of 380L per day.

<b>Urban Data (2008)</b>	
With improved drinking water	100%
With household drinking water	100%
With improved sewerage	N/A
With household sewerage (2004)	88%
With 2 <sup>o</sup> sewerage treatment	95%

### Development of sewerage services

In 1950, New Zealand had five sewage treatment plants. By 1997 there were 220, with 80% of households connected to them. Surveys in 1976 and 1981 showed that just over 60% of the population were connected to sewerage treatment plants. Around 17% of the population had their sewage discharged untreated, mostly into the sea, and around 20% were not connected to a sewerage system at all, but relied on septic tanks. In the intervening decade, the percentage connected to treatment plants is believed to have risen to about 80%, while those discharging untreated sewage are less than 5%. Some 15–20% of people probably still use septic tanks.

<b>Internal freshwater resources</b>	
Annual availability (2007)	327 km <sup>3</sup>
Per capita (2008)	76,600 m <sup>3</sup>
Annual withdrawal (2007)	0.6%
Domestic (2007)	48%
Industrial (2007)	9%
Agriculture (2007)	43%

<b>Freshwater</b>	
Annual availability (1998)	327.0km <sup>3</sup>
Per capita	88,859m <sup>3</sup>
Annual withdrawal (1991)	2.0km <sup>3</sup>
Domestic (1987)	46%
Industrial (1987)	10%
Agriculture (1987)	44%

### Spending needs and infrastructure performance

While the municipal water and wastewater systems are regarded as being fairly comprehensive, much of the infrastructure is in need of replacement or rehabilitation (for example, urban non-revenue water was 16% in 2003) and wastewater treatment facilities need to be upgraded to secondary standard, along with developing a suitable storm water management system. In 2003, 9% of urban water quality was seen as unsatisfactory by the Ministry of Health and 3% was of marginal quality.

In addition, water demand is expected to rise by 20% between 2001 and 2021, along with wastewater generation increasing by 21.5%. (Source: PWC (2004) Ministry of Economic Development, Infrastructure Stocktake, PWC, New Zealand). The government believes that the water and wastewater systems need NZD5billion to be modernised in the medium term. Watercare, the Adelaide utility that serves 32% of New Zealand's urban population for water and 24% for wastewater, publishes an annual Asset Management Plan covering current capital spending and forecast capital spending for the next two decades:

### New Zealand's 2010-29 Asset Management Plans (NZDmillion)

	<b>Water</b>	<b>Wastewater</b>	<b>Shared</b>	<b>Total</b>
Capex	1,155.5	1,653.3	185.2	2,994.2
Opex	532.2	923.1	509.1	1,964.4
Total	1,687.7	2,576.6	694.3	4,958.7

Source: Water Care (2008) 2010-2029 Asset Management Plan, Water Care Services Limited, Auckland, New Zealand

<b>Groundwater</b>	
Annual availability (1998)	198.0km <sup>3</sup>
Per capita	53,804m <sup>3</sup>

<b>MAJOR CITIES</b>			
<b>City</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Auckland	1,148,000	1,240,000	Partial sewerage PPP

### PSP & PPP

New Zealand has to date adopted a somewhat ad hoc approach to PSP and PPP. Two project-related contracts have been awarded, but the Government has stated that it is currently against privatising services for a city as a whole. It is likely that in the medium term, any further PSPs will be linked to sewerage expansion and upgrading schemes.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Pakapura District	Water and sewerage concession	United Water
Ruapehu	Water and sewerage BOT	United Water
Thames-Coromandel	Water and sewerage BOT	United Water
Wellington	Sewage treatment DBO	United Water
Hutt Valley	Sewage treatment DBO	NZWS

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
United Water	VE (France)	81,000	251,000	251,000
NZWS	SE (France)	0	160,000	160,000

**PAKISTAN**

<b>Economics (2008)</b>	
GNI per capita	USD950
GNI per capita (PPP)	USD2,590
Agriculture	20%
Industry	27%
Services	53%

**PSP and politics**

The Government was elected in February 1997 on a mandate for encouraging the PSP of various utilities and industries under the auspices of the PSP Commission. The PSP programme was temporarily halted with the suspension of foreign aid and finance to Pakistan in May 1998 following the resumption of nuclear testing by Pakistan and India. IMF and ADB lending to Pakistan was resumed in January 1999. However, the IMF is concerned about the financial difficulties of the Water and Power Development Authority, where it believes that the Government needs to finalise restructuring plans and restart its PSP programme once economic conditions allow.

In 2003, the United Nations (UN) recommended that water needs to be priced to reflect its cost in Pakistan and to end agricultural cross subsidies. The UN said 56% of the population had access to safe drinking water and 24% had adequate sanitation. Some degree of private sector participation was called for, but no further details were given. The Pakistan government approved six water development projects worth USD1.7billion (EUR1.5billion) in September 2003.

<b>Population</b>	
Total 2009 (million)	180.8
Total 2020 (million)	211.7
Urbanisation in 2008	36.2%
Urbanisation by 2020	42.8%
Urbanisation by 2050	63.7%

**The environment and politics**

In September 2003, General Musharraf called for Pakistan's four provinces to develop an integrated plan for using water from the Indus, which flows through Sindh, the North West Frontier and Punjab, and to agree on the construction of at least two major dams on the river. This may have significant repercussions with India, which also uses the river. One site at Kalabagh is under consideration, while a feasibility study for a reservoir at Bhasha in the northern region was completed in 2004. It appears that these studies have not been put into action.

A National Conservation Strategy was set out in 1992, with a ten year investment plan. The plan has been found to be poorly defined and probably over-ambitious in terms of affordability and its ease of enforcement and monitoring. The 1983 Environmental Protection Ordinance is currently under revision.

The federal Environmental Protection Agency (EPA) is seen as weak in comparison with Government departments that are seen to oppose environmental and public health related measures. The EPA in particular is lacking suitable monitoring and enforcement powers.

In 1998, an Environmental Protection Council was set up, but it does not include members of the provincial environmental protection agencies and thus has little concrete effect with regards to influencing Government policy. This is demonstrated by the fact that the Government's 1988-2003 Perspective Plan did not include environmental or public health concerns.



<b>Urban Data (2008)</b>	
With improved drinking water	95%
With household drinking water	55%
With improved sewerage	72%
With household sewerage (2004)	40%
With 2 <sup>o</sup> sewage treatment	1%

### Environment and public health issues

In Baluchistan province, the groundwater table is decreasing by 2-3 metres every year as a result of a prolonged 3 year drought and wasteful irrigation methods. In Sindh province, the Council of Karachi's Industrial Associations (CKIA) estimates that industries are losing production worth RS100million (EUR2.1million) daily due to the shortage of water. In 2002, 45% of the rural population had access to clean water. In 1987, 51% of the urban population and 6% of the rural population had access to sanitation. In 2002, 38% of the population as a whole had access to piped water, but there are considerable reservations about its quality. 60% of infant mortality is understood to occur because of waterborne diseases.

In 2009, it was estimated that water related disease costs the Pakistani economy some RS112billion pa (USD1.4billion).

City	Rawalpindi	Karachi	Lahore
Population	1,500,000	15,000,000	5,500,000
Coverage – water	85%	82%	88%
Coverage – sewerage	35%	60%	84%
Hours of supply per day	11-15	1-10	16-23
Non revenue water	30%	30%	42%
Billing collection efficiency	64%	25%	77%

Data on environmental degradation is thin. The World Bank believes that industrial effluent pollution loading increased 6-10 times between 1963 and 1988 at a time when GDP increased threefold. In 1992 there were three sewage treatment works in Pakistan, two of which were understood to be operating intermittently. 36% of groundwater resources are considered highly saline.

<b>Internal freshwater resources</b>	
Annual availability (2007)	55 km <sup>3</sup>
Per capita (2008)	331 m <sup>3</sup>
Annual withdrawal (2007)	308.0 %
Domestic (2007)	2%
Industrial (2007)	2%
Agriculture (2007)	96%

Pakistan is moving towards market based approaches for abating water pollution and optimising water availability. Groundwater is free while water provision to industry and agriculture is subsidised.

### Plans and priorities

The 2005 National Environmental Policy is based on the Water Sector Strategy that aims to see the sustainable management of water resources in Pakistan by 2025 through universal water provision and 80% sewerage coverage in urban areas along with all urban areas having access to treated water from 2015.

40% of water supplied to Lahore does not undergo treatment and 60% of effluents in the city receive no form of treatment. Non revenue water in Islamabad currently runs at 60%. In Karachi, wastewater connection rates are below 60% and of this, less than 30% receives any form of treatment. The sewerage system in Karachi has had little investment since 1965, but under the Karachi Master Plan 2020 the city seeks to have a 90% sewerage connection by 2020, with 100% of wastewater effluents treated.

The Pakistan Water Sector Strategy anticipates total spending of USD8billion between 2003 and 2011. 0.1% of GNP was spent on sanitation in 2004-05. It is anticipated that the private sector spending share will be 50% of the total sum outlined below.

Public sector environment projects	PKRbillion
2000-05	7
2005-10	28
Clean Drinking Water for All	
2005-08	10
2006-07	4
Other spending	
Total allocation	120
2004-05 spend	7
2006-07 budget	9

Groundwater	
Total recharge (1998, km <sup>3</sup> )	55.00
Per capita (1998, m <sup>3</sup> )	372
Withdrawals (1980, km <sup>3</sup> )	45.00
For agriculture (1980)	89%

### The private sector and water services

The move towards a legal system based upon Shariah Law poses certain problems with regards to commercialising water provision, but this needs to be set against the condition of Pakistan's service infrastructure and the need to upgrade it. In addition, there have been recent calls by a number of Islamic scholars to recognise that the provision of water carries a monetary value. To date, the only formal PSP proposals have been for Karachi's water and sewerage services.

The National Drinking Water Policy unveiled in September 2009 seeks to promote PSP in all aspects of water management.

### Companies seen

Seven firms pre-qualified in February 1998 to submit tenders for the proposed PSP of the Karachi Water and Sewerage Company: Anglian Water International (AWG), Biwater International (Biwater), Hyder, Thames Water, International Water (United Utilities), Générale des Eaux (VE) and Suez. Biwater has been awarded one USD14million construction contract to increase and improve potable water supplies to Karachi, including two water treatment works and a pumping station serving 30% of the city.

MAJOR CITIES			
Population	2005	2015	Status
Karachi	11,608,000	15,155,000	PPP proposals stalled
Lahore	6,289,000	8,271,000	PPP under consideration
Faisalabad	2,494,000	3,326,000	N/A
Peshawar	1,240,000	1,669,000	N/A
Gujranwala	1,440,000	1,937,000	N/A
Rawalpindi	1,770,000	2,371,000	N/A
Multan	1,452,000	1,944,000	N/A
Hyderabad	1,392,000	1,864,000	N/A
Islamabad	1,068,000	1,854,000	N/A

In 2006 Veolia Water gained a design-build contract to develop sewage treatment facilities for the Capital Development Authority of Islamabad. The EUR25million contract involves rehabilitating the two extant facilities and the construction of a new plant and is being supported by the French government. The two extant plants have a combined PE of 135,000 and the new facility will have a PE of 200,000.

Sources:

*ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Pakistan, ADB, Manila*

*Government of Pakistan (2009) National Drinking Water Policy, Ministry of the Environment*

**REPUBLIC OF PANAMA**

In 1999, Biwater was awarded a 30 year BOOT concession for bulk water provision to Laguna Alta for 350,000 people in Panama City. Aguas de Panama began operating the USD25million Laguna Alta bulk drinking water plant in 2003. The 20million gallons per day facility will serve the residents of the La Chorrera, Arraijan and Capiira areas, west of the Panama Canal. Laguna Alta will supply a minimum of 15million gallons per day for the first three years of the 30 year concession, and 20million gallons per day for the remaining 27 years. Biwater has built eight water treatment plants in Panama since 1982, but this is the first PSP contract in the country.

Panama City's water and sewerage services, along with other urban areas in the republic may have a PPP in due course. The Inter-American Development Bank is providing a USD45million loan for preparing the restructuring of Panama's water and sewerage services. Instituto de Acueductos y Alcantarillados Nacionales (IDAAN) is to be opened to private sector participation for financing and management, with 51% of its stock to be held by a strategic private investor for water provision and sewerage. The total loan package is for USD65million, with local funding of USD20million.

This concession will involve serving a population of over 2.7million inhabitants for the next 30 years. This will require an investment of USD50million in the first five years and another USD90million over the following 25 years. In all, around PAB21,000million will be invested during the total concession period. As a counterpart, the annual billing foreseen for the services rendered is approximately USD80million (almost PAB12,000million at the current rate of exchange and more than PAB300,000million during the entire concession). Although ten companies and consortia expressed interest in the concession and six qualified for the formal bidding process in 2000, little subsequent progress has been made.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Laguna Alta	30 year water BOOT	Biwater

Panama revived plans in 2005 to clean up the Panama Bay along with developing Panama City's sewer network. The first phase will involve designing pumping stations, a WWTW and separate drainage networks for rainwater and sewage and will focus on the older parts of Panama City, serving an area of around 500,000 inhabitants. In 2005, a USD263million plan for sewerage and sewage treatment for Panama Bay was drawn up by IDAAN with support from the IADB and the JBIC with private funding anticipated. This will cover sewerage (USD52million), bulk wastewater transport (USD43million), sewage treatment and disposal (USD156million), systems rehabilitation (USD7million) and a storm sewerage system (USD5million).

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Biwater	Sembcorp (Singapore)	350,000	0	350,000

**PARAGUAY**

Empresa de Servicios Sanitarios del Paraguay (Essap), owned by the Paraguayan Government, is the sole provider of piped water and sewerage services in all towns and cities with populations of 4,000 people or more. Essap supplies a total of 250,000 people, chiefly in Asuncion and the surrounding towns. 42% of the population in these towns is connected to piped water, and 35% to the sewerage network. In Asuncion, the connection rates are 86% for water and 68% for sewerage. As a result, most water provision is in fact carried out by private vendors.

Since 1997, the government has been preparing for the PSP of Essap. A national regulatory agency was set up to oversee Essap and to see how medium sized firms can support its activities through semi-independent sewerage projects. Essap is under consideration for PSP, a project supported by the World Bank since 1999. It would need to pay off the company's USD500million in debts and to mobilise finances for its belated service expansion. A standby financing facility provided by the IMF in 2003 was renegotiated, on the condition that various PSP initiatives, including one covering Essap, are developed. While the IMF seeks full PSP in most cases, Essap will be allowed to develop a concessional or O&M type contract. The general aim was to attract private investment towards Essap by 2008, which does not appear to have taken place.

Paraguay's national environmental sanitation service, Senasa, is planning to spend USD26million supplying 450 communities with drinking water, sources say. Work recently began and drinking water is expected to reach residents in July. The project is a part of Senasa's USD55.7million fourth rural water supply and sanitation project and its USD17.1million small-communities drinking water supply and sanitation program. The World Bank approved a USD40million loan in 1997 for the former and the Inter-American Development Bank approved a USD12million loan in 2001 for the latter.

**PERU**

<b>Economics (2008)</b>	
GNI per capita	USD3,990
GNI per capita (PPP)	USD7,590
GDP in Agriculture	7%
GDP in Industry	36%
GDP in Services	57%

**Service provision**

In 1990, 49% of urban households were supplied with piped water (38% with inside taps) and 60% with sanitation, including 51% with flush lavatories. A survey of 12,314 households in urban areas found 75% had piped water and 58% had flush lavatories. The coastal cities of Peru (notably Lima) are characterised by increasingly severe water shortages due to low rainfall in their regions. In cities, 70% of connections have 10 hours of daily supply, and 20% have more than 20 hours. The water pressure in 70% of the districts does not meet the recommended standards. In 2004, 82% of urban households had their own water supplies. Sewage treatment in urban areas rose from 13% in 1997 to 22% in 2004.

<b>Population</b>	
Total 2009 (million)	29.2
Total 2020 (million)	34.2
Urbanisation in 2008	71.4%
Urbanisation by 2020	73.6%
Urbanisation by 2050	82.5%

**Regulatory background**

Peru has adopted legislation that supports both the private sector and decentralisation. Under this legal framework, the action of the state will be redirected from complete responsibility for water allocation and the construction and operation of water development projects to a role of mainly support and control, entrusting private users with the responsibility for managing water use. The Water Law of 1995 also allows for the marketing of water rights. The law has been influenced by the 1981 Chilean water law, which seeks to minimise the Government's role in public interest elements and to rely on regulation and market forces. Peru's Pacific Coast watersheds have been organised into five autonomous entities (PSP Plans table below).

Peru's congress passed a new bill amending the 1996 public water utilities (EPSs) management law in June 2006 with the aim of improving conditions for investment and to bring water rates up to date. This legislation aims to mobilise USD540million in investment in concession projects. Peru's 41 EPSs have USD1.62billion in debt, of which a third is to the former national housing fund Fonavi. The measure would forgive this public debt for the utilities to redirect this money to investing in infrastructure works.

<b>Urban Data (2004)</b>	
With improved drinking water	90%
With household drinking water	84%
With improved sewerage	81%
With household sewerage (2004)	67%
With 2 <sup>o</sup> sewage treatment	10%

**Sedepal**

The PSP of Sedepal, which provides water and sewerage services to 5million out of Lima's 6.67million people, was intended to be the follow-up to Aguas Argentinas. A 30 year concession contract was drawn up, with investment demands being USD600million in the first five years and USD1billion in the first ten. In preparation, 406,000 water meters were installed. Since it was first formally mooted between 1995 and 1996, it has been bitterly opposed by anti-PSP elements. During 2004, various moves towards a partial flotation of Sedepal were made, along with attempts to outlaw private investment in the entity.

Sedepal started a PEN1.98billion (USD606million) project in late 2006 to expand Lima's water distribution to an additional one million people. This is being supported by a 15.8% tariff increase proposed by Sunass, the utility's regulator. The proposed Sedepal concession contract was long discussed since the mid 1990s and tentatively announced in 2002 but never took off. Instead, Traboada sewage concession was awarded in 2009.

<b>Internal freshwater resources</b>	
Annual availability (2007)	1,616km <sup>3</sup>
Per capita (2008)	56,040m <sup>3</sup>
Annual withdrawal (2007)	1.2%
Domestic (2007)	8%
Industrial (2007)	10%
Agriculture (2007)	82%

### Water services in the main cities

1991	Piped water	Indoors
Lima	94%	85%
Arequipa	91%	67%
Trujillo	78%	69%

In 1998, piped water in Lima cost USD0.15-0.30 per m<sup>3</sup> against up to USD3.00 per m<sup>3</sup> for water supplied by vendors. As a result, while piped water customers use on average six times as much water, their bills are lower.

### Water and sewerage coverage in Peru, 2005

2005	Water	Sanitation
SEDAPAL - Lima	89%	84%
Large utilities (9)	82%	48%
Medium utilities (20)	79%	61%
Small utilities (16)	71%	51%
Small municipalities (490)	60%	33%
Urban	81%	68%
National	76%	57%

According to SUNASS, Peru's basic services regulator, USD3.8billion is needed to achieve full water and sewerage coverage in urban areas. Peru's Ministry of Housing and Sanitation in 2005, believes that the country needs to spend USD4.05billion to reach its 2015 urban water and wastewater treatment goals for 2015.

Service	2005 coverage	2015 coverage	Capex cost
Water	81%	87%	USD1.24billion
Sewerage	68%	84%	USD1.39billion
Wastewater treatment	22%	100%	USD1.13billion

During the 1990s, USD200 to 400million was spent by the Government each year on expanding water and sewerage services, but this fell to about USD40-50million pa since 2000. The national utility ANA estimated in 2009 that USD3.2billion was needed for major investment projects including irrigation technologies; the construction of wastewater treatment plants in large cities, rehabilitating water distribution networks to reduce leakage and new water treatment works.

### Sewerage in the main cities

1991	Sanitation	Flush
Lima	87%	83%
Arequipa	70%	66%
Trujillo	74%	56%

<b>Groundwater</b>	
Annual availability (1998)	303.0km <sup>3</sup>
Per capita	12,219m <sup>3</sup>
Annual withdrawal (1973)	2.2 kkm <sup>3</sup>
Domestic	25%
Industrial	15%
Agriculture	60%

### PSP plans

Five PSPs have been in preparation since 2000:

<b>Company</b>	<b>Connections</b>
SEDAPAL	1,081,000
SEDAPAR	147,000
EPS GRAU	141,000
SEDALIB	102,000
EPSEL	96,000

These PSP proposals to some extent represent a wish list, since the PSP of Sedapal remains dependent on political circumstances. In May 2002, there were violent demonstrations in Arequipa when the Government went ahead with its auction of the power utilities Egasa and Egesur.

In 2005 the Peruvian government agreed the first of 45 concessions for water and sewerage contracts. By 2008, the proposals were put on ice due to local political opposition. In the end, two contracts were awarded: Huascacocha (water for the desert coast) and Traboada.

<b>Main Concessions</b>	<b>USD</b>
Piura EPS and Paita EPS	130
Huancayo EPS	110
Water treatment plant in Huachipa	130
"Water for all" programme	170

The Ministry of Housing, Construction and Sanitation advised BN Americas (29<sup>th</sup> September 2008) that USD5billion will be invested in public-private partnerships for developing water and sanitation projects during the 2006-11 period, with the aim of providing basic services to the entire population. This includes some USD462million being invested in five potable water and wastewater treatment plants outside the Lima region by 2011 (BN Americas, 2<sup>nd</sup> October 2008).

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Lima	7,186,000	8,026,000	N/A

After submitting the only bid, Brazilian construction firm Odebrecht has won the 20-year concession to develop the Olmos water supply and hydroelectric project in Lambayeque department. Odebrecht will construct the first stage of the dam as well as the tunnel which will transport water to the irrigated areas. The project will take water from the Huancabamba River to generate electricity and help irrigate 30,000 hectares in the Olmos area. The Peruvian government is providing roughly half of the money for the USD140million project, and Odebrecht will supply the rest. Odebrecht's concession only covers the first stage of the project, but once complete, the project aims to supply 2,050million m<sup>3</sup> pa of water, to be able to generate 600 megawatts of electricity and to irrigate more than 150,000ha for agricultural production.

Peruvian-Argentine consortium Latin Aguas Concyssa was awarded the 30 years Emfapa concession for Tumbes, Zarumilla and Contraalmirante Villar in October of 2005. In Tumbes, where water supply used to be available on average six hours a day, some areas now have 20 hours of water supply a day, while other areas with 2-4 hours of supply now have 4-8 hours a day. The consortium has increased production at Tumbes' El Milagro water treatment works by 90%. Emfapa serves 180,000 urban customers, providing 68% and 32% water and sewerage coverage respectively.



Consortio Agua Azul, which operates the Cono Norte (Río Chillón) concession saw profits fall by 77% in 2005 to PEN2.85million (USD855,000) due to exchange rate losses and high interest costs. Sales eased by 0.42% to PEN36.1million and operating profit fell 3.35% to PEN18.5million. Consortio won a 27 year BOT concession in 2000 for Río Chillón, which supplies water to Sedapal. The contract may be extended to 33 years at the concessionaire's request.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Cono Norte	27 year water concession	Aqua Azul
Tumbes	30 year water & sewerage concession	Latin Aguas Concyssa

ProlInversión, the state investment promotion agency is seeking bidders for a concession covering the Sedam Huancayo water utility in central Junín department. Huancayo has some 400,000 people serviced by 52,527 potable water connections and 50,722 sewerage connections. The concessionaire would have to invest some USD100million over 30 years to maintain and expand potable water and sewerage services.

Four bidders have pre-qualified for the concession of Peru's Piura and Paita basic service utility (EPS). Bidders include Argentine-Peruvian consortium Latin Aguas-Concyssa, Concesionario de Aguas de Piura (Colombia's Conalvias and Cuba's Técnica Hidráulica), Spanish-French consortium Proactiva-Medio Ambiente, and Conhydra-Odinsa, from Colombia. The water utility requires a USD130million investment, of which USD70million will be financed by a loan from the Japan Bank for International Cooperation.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Aqua Azul	ACEA (Italy)	800,000	0	<b>800,000</b>
LA Conc	Latin Aguas (Argentina)	180,000	80,000	<b>180,000</b>

Source:

WSP / Ministry of Housing, Construction and Sanitation (2008) *Evaluation of Small-scale Providers of Water Supply and Sanitation Services in Peru*. World Bank, Lima, Peru

**PHILIPPINES**

<b>Economics (2008)</b>	
GNI per capita	USD1,890
GNI per capita (PPP)	USD3,900
Agriculture	15%
Industry	32%
Services	53%

**Water services**

In 1980, 45% of the population had access to the water supply. In 1987, 63% had access to safe water, with 31% via piped water; 86% in Metro Manila, 55% in other urban areas and 62% in rural areas. The term 'safe' with regards to drinking water is open to debate. Just over 36% of the country's river systems were classified as sources of public water supply in 2003 and up to 58% of groundwater sampled is bacteriologically contaminated and needs treatment. Approximately 31% of illnesses monitored for a five-year period were also caused by water-borne sources. 1,000 out of each 100,000 people die each year because of diarrhoea, one of the highest known rates in the world.

<b>Access to services</b>	<b>1980</b>	<b>1987</b>	<b>1993</b>
Access to safe water	45%	63%	81%
Access to sanitation	56%	69%	72%

**Sewerage services**

The only major sewers cover 8% of the Metro Manila area, (all discharged untreated). Small sewerage systems exist in Davao (central area population 850,000), Zamboanga (442,000), Cebu (610,000), Cauayan (340,000) and Isabela (district population 1.08million). Sanitation coverage is currently 65% rural, 85% urban. In 1980, 56% of the population had access to sewerage or septic tanks. By 1987, 69% had safe sanitation, 15% unsafe sanitation and 16% none. 52% of BOD discharged was via domestic sewage, with 48% from industrial sources.

	<b>1994</b>	<b>2000</b>
Diarrhoea morbidity	1.0%	0.4%
% access to sanitation	78.2%	93.0%
% access to safe water	87.0%	100.0%

**Sewage treatment coverage**

<b>City</b>	<b>People served</b>	<b>% coverage</b>
Metro Manila	1,010,000	8%
Bagulo City	5,300	2%
Zamboanga City	3,700	1%
Vigan City	1,360	3%
Bacolod City	2,020	1%
Cauayan, Isabela	4,000	2%
Davao City	1,161	1%

During the late 1990s and early 2000s, sanitation accounted for 3% of water related spending. Spending of PHP158billion will be required if 50% of the urban population is to have adequate sanitation services by 2015.

<b>Population</b>	
Total 2009 (million)	92.0
Total 2020 (million)	103.3
Urbanisation in 2008	64.9%
Urbanisation by 2020	72.3%
Urbanisation by 2050	83.9%

## PSP and priorities

The National Water Crisis Act (Republic Act No. 8041) was passed in June 1995. This recognised the Government's past shortcomings in water provision and is aimed at improving both the extent and quality of water provision. Sewerage remains a relatively low priority outside Manila, apart from industrial discharges that directly impinge upon drinking water quality. The Act superseded previous legislation and the Philippine Water Code (1979), whereby private customers were given the highest priority. This formed the basis for the Manila concession award process. PSP is allied with the intention of the country becoming a potential regional centre for the environmental services sector. The Government has put a higher priority on PSP for bulk water supply and sewerage, along with solid and hazardous waste management than for water distribution systems except in areas of greater shortages.

PSP has been spurred by the passing of the National Water Crisis Act and the realisation that previous plans have not begun to address public health concerns. The Philippines want ideas for technology transfer as well as straightforward projects, seeing themselves as a potential regional centre for the environmental services sector. The Philippines are keen to privatise bulk water supply and sewerage, along with solid and hazardous waste management. The Government was less keen on privatising the actual water distribution system except in areas of greater shortages. A broadly based award process for urban sewerage and bulk water provision concessions is now under way, although it is developing appreciably more slowly than when first unveiled in 2002.

<b>Urban Data (2008)</b>	
With improved drinking water	93%
With household drinking water	60%
With improved sewerage	80%
With household sewerage (2004)	7%
With 2 <sup>o</sup> sewage treatment	0%

## Environmental management and laws

The National Water Resources Council (NWRC) is a semi-autonomous entity under the Department of Public Works and Highways (DPWH). The DPWH is responsible for the major water and sewerage projects and also for rural services. The Metropolitan Water and Sewerage System (MWSS), serves Manila. Major cities have separate service entities, while small towns are managed via a collective organisation. The Department of Environment and Natural Resources (DENR) is responsible for implementing legislation and carries out environmental management work along with the Environmental Management Bureau (EMB). The core items of legislation are: Water Usage and Classification (1978) with revised Water Quality Criteria (issued in 1990 DENR Administrative Order No. 34) and Effluent Regulations 1982 (revised 1990 DENR Administrative Order No. 35).

The Clean Water Act of 2004 (implemented in 2005) attempts to consolidate what has been a highly fragmented set of regulations. The most influential of these was the 1995 Philippine Water Crisis Act, which paved the way for the Manila concessions. The 2004 President's Priority Program on Water (P3W) runs from 2004-10 and seeks to improve access to water by 50% with an emphasis on informal settlements (ADB, 2007), with an overall water coverage of 92-96% by 2010. However, with the urban population growing by 2million pa urban water coverage has fallen from 95% in 1990 to 87% in 2004.

<b>Internal freshwater resources</b>	
Annual availability (2007)	479 km <sup>3</sup>
Per capita (2008)	5,302 m <sup>3</sup>
Annual withdrawal (2007)	6.0%
Domestic (2007)	17%
Industrial (2007)	9%
Agriculture (2007)	74%

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	180.0
Per capita (1998, m <sup>3</sup> )	2,494
Withdrawals (1980, km <sup>3</sup> )	3.9
For domestic use (1980)	0%
For industry (1980)	50%
For agriculture (1980)	50%

### Water companies noted

Biwater, United Utilities, VE and Suez are all active in the Philippines. Benpres Holdings of the Philippines, George Kent Holdings (Malaysia) and Brown & Root (USA) have all been seeking contracts, the former building on its role in the MWSS PSP.

In August 1999, Benpres was awarded the first solicited bid outside Manila. This was a PHP70million 15 year DBO for the Laguna water system serving the town of Magdalena. Benguet Corp gained a second contract in 2005, a 25 year management contract with the Baguio Water District, Benguet to deliver 50,000m<sup>3</sup> per day to Baguio City in North Luzon. Benguet is using water from its former open pit in Antamok, seven kilometres from Baguio City, which acts as a reservoir and will develop and operate a dedicated water treatment plant. PHP3billion in funds is being raised for the project.

Manila Water Company has formed a consortium with Stateland Inc and Vicsal Development Corp to develop the bulk water supply in Carmen for supplying water to areas served by Metro Cebu Water District. This is a PHP2billion project for supplying an additional 46,000m<sup>3</sup> per day to Metro Cebu from the Luyang River in Carmen town in north Cebu province. MCWD currently supplies 153,000m<sup>3</sup> per day against a demand of 215,000m<sup>3</sup> per day.

### BWI - Small scale PSP

Balibago Waterworks Inc (BWI) was founded in 1958 to develop small scale water projects in Luzon Island. It was taken over in 1988 in order to expand its services. The company offers a standard 35 year water treatment and provision BOT contract to municipalities. By 2009, it served 64,000 people via 31 branches in nine provinces on the island. Contract sizes range from 100 people to 15,000. (Source: Panilio C L (2010) The Balibago Waterworks Story. Presentation to the GWI Global water Summit, Paris, France, April 2010).

<b>Philippines – Local projects</b>			
<b>Project</b>	<b>Operator</b>	<b>Population</b>	<b>Comments</b>
Calapan, Mindoro	Calapan Water Development Co	106,000	25 year Concession, started in 1991
Lopez-Jaena	Pamatong	25,660	Design, Build, Lease contract started in 2002
Calamba	Pamatong	281,000	Design, Build, Lease contract started in 2002

Source: Castalia (2004) Sector Note on Water Supply and Sanitation for Infrastructure in East Asia and the Pacific Flagship, Review by Castalia for the World Bank, ADB and JIBC

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Metro Manila	10,686,000	12,917,000	MWSS (two zones)
Davao	1,327,000	1,680,000	Proposals under development

### City PSP study: Manila's MWSS

The Metropolitan Water and Sewerage System (MSWW), was founded in 1972. Metro Manila is a conurbation in the true sense. The area covers 11.5million people in four cities and 37 municipalities, with the population growing at 3% each year. The population of Manila is expected to double by 2025. 40% of those within the area currently live below the World Bank's definition of the poverty line. Water coverage was 53% in the 1970s, 70% in the 1980s and 80% in 1993/94. Water losses of 65% in 1986 were cut to 58% in 1991 and 56% in 1992. Some of this comes via water theft and illegal connections. The MWSS sewage system was built from 1904-11 and designed to cover 500,000 people. 11% of the

population were connected to sewerage services in 1990 and 16% (828,000 in central Manila and a further 56,000 in Makat) in 1993. Sewage goes to a long sea outfall.

The PSP of MWSS was arranged by the IFC to mobilise USD6billion of investment for upgrading and expanding the water distribution system and in the longer term, to install a modern sewerage and sewage treatment infrastructure. The MWSS has been split into two zones, each taking over the existing assets, with each responsible for improving these and adding new assets. The contracts are to be run on a 25 year BOT basis. MWSS remains as a regulatory overseer for the concession holders for the life of the contracts. The IFC set the following performance targets:

<b>Water distribution</b>	<b>1998</b>	<b>2001</b>	<b>2006</b>
Coverage	67%	85%	100%
<b>Water availability</b>	<b>1998</b>	<b>2006</b>	<b>2006</b>
(Hours/day)	16	24	24
<b>Sewerage</b>	<b>1998</b>	<b>2023</b>	<b>2023</b>
Coverage	3%	83%	83%

The contract awards to Suez (Maynilad Water) and United Utilities (Manila Water) represent the largest water and sewerage PSP in Asia to date. Each adopted differing pricing patterns:

<b>Operator</b>	<b>PHP/m<sup>3</sup></b>	<b>USD/m<sup>3</sup></b>
MWSS (in 1997)	8.78	0.33
UU/Ayala (eastern)	2.32	0.09
Suez/Benpres (western)	4.97	0.19

The subsequent performance of these two contracts is examined in detail in the company entries. Following the re-nationalisation of Maynilad Water (Suez continues to hold 16% of the company), 11 companies and consortia requested the Maynilad Water re-PSP bidding documents and five formally submitted bids: DMCI Holdings Inc, & Metro Pacific Investment Corp. (Philippines), Manila Water, Marubeni Corp (Japan), Noonday Asset Management Asia Pte. Ltd (Singapore) and Karunakaran Ramchand (India). Maynilad Water was sold to the DMCI/Metro Pacific consortium – see the company entry on Metro Pacific Investments.

### **Maynila Water – serving formal and informal communities in Manila**

Metro Manila covers 11.5million people in four cities and 37 municipalities, with the population growing at 3% each year and its population is expected to double by 2025. 40% of those within the area currently live below the World Bank's definition of the poverty line. The PSP of MWSS was arranged by the World Bank's IFC to mobilise USD6billion of investment for upgrading and expanding the water distribution system and in the longer term, to install a modern sewerage and sewage treatment infrastructure. MWSS was split into two zones, each with a 25 year BOT contract. MWSS remains as a regulatory overseer for the concession holders for the life of the contracts.

The concession for the eastern sector was awarded to the Manila Water Company (MWC) a joint venture between Ayala (Philippines) and International Water (originally Bechtel (USA) and United Utilities (UK) with Bechtel leaving in 2002) who started their concession in 1998. Since the concession started, the number of people served in the zone has increased from 3.5 to 5.0million. By 2022, it is estimated that the zone will have 8.5million people. In 2007, the concession was extended for a further 10 years to 2032.

<b>Manila Water</b>	<b>1997</b>	<b>2007</b>	<b>2009</b>
Population	4.6million	5.3million	6.0million
Households served	325,000	986,000	1,086,000
Access to water supply	58%	99%	99%
Access to 24 hour supply	26%	99%	99%
Access to sanitation	3%	12%	16%
Staff / 1,000 connections	9.8	1.7	1.5
Billed water (MLD)	440	1,040	1,085
Non revenue water	63.0%	23.9%	15.8%

All water supply targets set by the IFC have been met or exceeded to date. In March 2005, the company was listed on the Philippine Stock Exchange, 41% of the shares held by outside investors, 32% by Ayala of the Philippines, 19% by TNCs (United Utilities and Mitsubishi of Japan) and 7% by the World Bank's IFC.

The Tubig Para Sa Barrangay (TPSB) programme is designed to extend services into the barrangays (informal settlements) in the zone. It allows several poor families in depressed areas to share the cost of a single MWC water meter. By January 2008, 644 projects had completed, connecting a total of 1.3million people; 1.02million by the end of 2006 and a further 260,000 during 2007. Between 2008 and 2012, the company plans to connect a further 1.0million people in Rizal Province to the north of its central concession area. At the start of the programme in 1998, there were 39,000 cases of diarrhoea in the service area, compared with 22,000 in 2006 and 25,000 in 2006.

<b>TPSB programme</b>	<b>2000</b>	<b>2002</b>	<b>2004</b>	<b>2006</b>
Total household connections ('000)	401	470	556	909
TPSB connections ('000)	27	63	123	169
TPSB served population ('000)	166	383	740	1,020

698 projects had been completed by 2009, serving a total of 1.7million people.

Vended water typically costs PHP100 per m<sup>3</sup>, seven times higher than that charged by Manila Water under the scheme. During 2004, a 36% reduction in infant related mortality due to diarrhoea occurred due to the improved availability of potable water in the zone. 99.6% of water supplied by Metro Manila satisfied potable water standards in 2004 and has seen a 100% compliance rate between 2005 and 2007.

Sources:

*Manila Water (2005) Sustainability Report 2004*

*Manila Water (2006) Sustainability Report 2005*

*Manila Water (2007) Sustainability Report 2006*

*Manila Water (2008) Annual Report 2007*

*Manila Water (2009) Annual Report 2008*

*Manila Water (2010) Annual Report 2009*

### **Manilad Water Services (MWSI) – foreign currency exposure challenges**

Suez's Maynilad Water Services, Inc. (MWSI) was awarded the western half of the Metro Manila (MWSS) water distribution concession in August 1997. MWSI is tasked to transform the operation of a 119-year old water utility into an efficient and modern water distribution system, aside from setting up sanitation and sewerage systems. MWSI is meant to supply potable water 24 hours a day to approximately 6million people in the western zone by 2007.

MWSI had suffered from a foreign exchange crisis. The problems arose when MWSI took on 90% (USD800million) of MWSS' foreign debt, which between 1997 and 2000 doubled in Peso terms from PHP20billion to PHP40billion (USD946million) due to the Peso's weakness. Although MWSI gave notice to halt the concession in March 2003, continuing arbitration and associated legal processes have meant that it continued to run under the 1997 structure. The November 2003 and April 2004 agreement would have resulted in a write-off of PHP3.8billion (USD89.8million), PHP3.2billion in equity and PHP629million in debt (USD75.7million and USD12.1million respectively) and the loss of control in MWSI.

<b>Water services</b>	<b>1997</b>	<b>2005</b>
Non-revenue water	60%	69%
Households served	466,000	660,000
Water production (million L/day)	1,600	2,209
Water service coverage	63%	85%

Despite the financial problems, the concession has made some progress. The 194,098 new individual household connections include 74,266 in urban poor communities. Maynilad's high non-revenue water rate is in part due to the 1996 bid documents identifying only 2,500km of pipelines in the West Zone, when there were in fact 3,700km.

On April 29, 2005, MWSI and its bank creditors, along with the MWSS executed a Debt Capital and Restructuring Agreement. As part of this, MWSS acquired 83.97% of the shares of MWSI, with Suez holding the remaining shares. In return, the creditors released it from loan obligations worth a total of USD220million. MWSS took over the operations of MWSI in January 2006 and in November 2007 they were acquired by a consortium led by DMCI Holdings Inc, and Metro Pacific Investment Corp of the Philippines. A partial flotation of Maynilad Water was planned for late 2008.

The chief difference between the two concessions had been that Manila Water enjoys a customer base underpinned by industrial and commercial customers who were in a position to ride out the challenges posed by the currency crisis of 1997-98. In both cases, it is evident that significant work has been made in terms of improving network efficiency and service coverage.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Clark EZ	Development of industrial zone services	CGE Utilities
Forto Bonifacio	Development of industrial zone services	CGE Utilities
Kailangan	15 year water services management	Benguet
Baguio	25 year bulk water provision	Benguet
Magdalena	15 year DBO for water services	Bayan Water
Manila (east)	PSP of MWSS	Manila Water Company
Manila (west)	Re-PSP of MWSS	In preparation
Subic Bay	Development of services for new town	Subic Water
Carmen	Bulk water provision	Manila Water Company

### Project proposals

The government continues to ponder tenders for the PHP3.7billion (USD67million) Laguna Lake bulk water supply BOT project intended to supplement Metro Manila's potable water supply. The scheme would supply at least 0.4million m<sup>3</sup> of potable water 24 hours a day to Metro Manila and adjoining areas.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Subic Water	Sembcorp (Singapore)	370,000	370,000	370,000
CGE Utilities	VE (France)	10,000	0	10,000
Bayan Water Services	Suez (France)	131,000	0	131,000
Benguet	Benguet (Philippines)	277,000	0	277,000
Manila Water Co	Ayala (Philippines)	5,200,000	500,000	2,500,000
Maynilad Water	Metro Pacific (Philippines)	4,300,000	700,000	4,300,000

Sources:

ADB – APDF (2007) *Asian Water Development Outlook 2007: Country Paper – Cambodia*, ADB, Manila

ADB (2007) *Country Paper: Philippines*. *Asian Water Development Outlook*, ADB, Manila

*Philippines Environment Monitor 2003*. The World Bank

**SINGAPORE**

<b>Economics (2008)</b>	
GNI per capita	USD34,760
GNI per capita (PPP)	USD47,970
Agriculture	1%
Industry	27%
Services	72%

**Service provision**

All of Singapore's 4.7million people are connected to the water and sewerage system. All water and sewerage services are managed by the Public Utilities Board (Water Department). The scarcity and cost of water limits average household consumption to 156L per capita per day. Distribution losses have fallen from 11% in 1988, to 8% in 1990 to below 5% since 2005. Drinking water quality is of a high standard.

100% of the population is linked to the sewerage network. Singapore has 2,000km of sewers, 122 pumping stations and six sewage treatment works (with sea outfalls). These sewage treatment works handle all the state's sewage and treat it to at least secondary standard. The Ministry of the Environment spent USD2.7billion on sewerage facilities between 1992 and 2003, as these facilities are expanded and upgraded to secondary and tertiary standard. The Tuas and Changi wastewater treatment works were linked in 2009 to a SPD3.65billion Deep Tunnel Sewerage System in 2008. The Changi facility has a 800,000 m<sup>3</sup> per day capacity. The facility is designed to be expanded to 2.4million m<sup>3</sup> per day if needed.

Three water treatment works have been upgraded between 2002 and 2010 at a total cost of USD107million, along with a 60million gallon per day expansion of the main plant at an additional USD115million. In addition, USD332million has been spent developing and expanding four storm water treatment and reclamation schemes. Water fees for domestic customers relate to water usage per month so as to encourage water conservation. In addition, there is a separate sewerage charge.

<b>Population</b>	
Total 2009 (million)	4.7
Total 2020 (million)	5.2
Urbanisation in 2008	100.0%
Urbanisation by 2020	100.0%
Urbanisation by 2050	100.0%

**Water resources**

Singapore currently remains broadly dependent on imported water from Malaysia's Johor state, with 60% of water resources piped in this way. The first water agreement with Malaysia expires in 2011 (signed with Johor state in 1961) and the second water agreement with Malaysia expires in 2061 (signed with Johor state in 1962). Malaysia sought to revise the 1961 agreement. In response, Singapore has developed a 50 year plan to reduce its dependence on Malaysia for water through a series of desalination plants and wastewater recovery schemes. Singapore believes that it can increase its internal share of water resources from 67% to 90% through a series of efficiency and recovery measures along with further desalination plants. It aims to be self-sufficient from 2061. From 2009, all lavatories are dual flush models.

**PUB – operating performance, 2004-09**

<b>YE March (Dec for 2005 &amp; 2006)</b>	<b>2004</b>	<b>2005</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Unaccounted for water (UFW)	5.0%	5.0%	4.5%	4.4%	4.4%
Domestic water consumption (l/c/d)	162	160	158	157	156
Number of customers	1,173,434	1,192,012	1,212,278	1,228,416	1,240,374



<b>Urban Data (2008)</b>	
With improved drinking water	100%
With household drinking water	100%
With improved sewerage	100%
With household sewerage	100%
With 2 <sup>o</sup> sewage treatment	100%

An agreement signed by Singapore and Indonesia in 1991 allows the two countries to jointly develop a water transfer system capable 4,546,100m<sup>3</sup> of water per day to supply both Singapore and Indonesia. Water would be transferred via two undersea pipelines of 450km between Riau's Kampar River (250km) and Bintan Island and Singapore (200km). The 2060 plan anticipates concentrating on internal resources.

Singapore's "Water For All" policy is based on "Four National Taps" [1] local catchment, [2] imported water, [3] NEWater and [4] desalinated water. 3 reservoirs will be developed in addition to the current 14 by 2009. In addition, the proportion of water from NEWater is set to rise from 7% in 2006 to 30% by 2011 through two additional facilities. Domestic water consumption was 158L/day in 2006, down from 162L/day in 2004 and PUB aims to ease this to 155L/day by 2012.

### **PSP of water provision**

In 2002, Singapore's Hyflux (70%) and Suez Ondeo (SE, France, 30%) gained a 20 year BOT contract to build SingSpring, Singapore's first desalination plant that will supply Singapore with 136,000m<sup>3</sup> of water per day by 2005, 10% of Singapore's anticipated water demand of 1.25-1.36million m<sup>3</sup> per day by that time. This is equivalent to the water needs of some 350,000 people. SE subsequently sold its stake to Hyflux as part of their debt reduction strategy and this stake was sold on to Tamaesk Holdings, the Government's private sector investment company.

Two PSP projects were awarded in 2005-07, covering the fourth and fifth NEWater reclaimed water projects: The Ulu Pandan facility entered service in 2007, delivering 116,000 m<sup>3</sup> of NEWater per day and 46,000 m<sup>3</sup> per day of industrial water. The 20 year DBOO was awarded to Keppel Integrated Engineering in 2005. The Changi NEWater DBOO attracted six bids, with Sembcorp Utilities offering a first year price of SPD 0.30 per m<sup>3</sup>. The facility has a capacity of 228,000 m<sup>3</sup> per day capacity having entered service in 2009 and was expanded in 2010.

A second desalination project is currently under development. A DBOO contract for the 318,500m<sup>3</sup> per day facility will be awarded by the end of 2010, with the facility entering service in 2013 with a 25 year water supply contract to PUB.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Changi	Changi NEWater, 25 year DBOO	Sembcorp
Ulu Pandan	Ulu Pandan NEWater, 20 year DBOO	Keppel
Tuas	Singspring desalination, 20 year BOT	Hyflux

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Sembcorp	Sembcorp (Singapore)	350,000	0	350,000
Keppel	Keppel (Singapore)	700,000	0	700,000
Hyflux	Hyflux (Singapore)	350,000	0	350,000

Sources:

*Ministry of the Environment & Water Resources (2007) Key environmental Statistics 2007, MEWR, Singapore*

*PUB (2009) PUB Annual Report 2009, PUB, Singapore*

*PUB (2010) Water for all: Meeting our water needs for the next 50 years. PUB, Singapore*

**SOUTH KOREA**

<b>Economics (2008)</b>	
GNI per capita	USD21,530
GNI per capita (PPP)	USD27,840
Agriculture	3%
Industry	37%
Services	60%

**Sewerage and water quality**

River water quality has improved since 1988: between 1994 and 1997, KRW5.6 trillion (USD4.6billion) was spent on water pollution control, including the construction of 52 sewage treatment works.

<b>Population</b>	
Total 2009 (million)	48.3
Total 2020 (million)	49.4
Urbanisation in 2008	81.5%
Urbanisation by 2020	84.2%
Urbanisation by 2050	89.9%

**Management**

The Environment Administration (founded 1980) was upgraded to ministerial status as the Ministry of Environment in 1990, with specific bureaux for water and sewerage opened in 1994. The Pollution Prevention Act (1963, revised 1971) was replaced by the Environmental Preservation Act in 1997, which in turn has become the framework for 24 separate Acts between 1990 and 1997, including three relating to water quality and sewerage and two for water resources management. The main legislation is contained in the Water Quality, Water Supply and Sewer Systems Acts. Green Vision 21 (1996-2005) is aimed at forming a comprehensive environmental compliance programme for the country. Water Vision 2020 (2006-20) seeks to address regional imbalances in water supply and demand, primarily through decreasing overall demand by 2.4billion m<sup>3</sup> pa through water management efficiency and water reuse.

<b>Urban Data (2004)</b>	
With improved drinking water	100%
With household drinking water	99%
With improved sewerage	100%
With household sewerage (2004)	65%
With 2 <sup>o</sup> sewage treatment	85%

**Infrastructure plans**

The Comprehensive Measures for Water Management is due to run between 1996 and 2011. A total budget of KRW90.9 trillion has been allocated (USD75billion) for these projects. This includes KRW28.9 trillion (USD24billion) for environmental improvements by 2005, including KRW26.9trillion (USD23billion) for the construction of 224 sewage treatment works. In addition, 43,786km of new sewage pipes are to be laid.

"Green Vision 21" was a USD68.2billion master-plan for upgrading the country's industrial and municipal environmental management between 1995 and 2005. This was followed in 2003 by a USD19billion plan which is to be completed in 2007. The government has since unveiled another long-term environmental plan, budgeting USD17.8 billion from 2007 to 2012, that will carry on the initiatives of Green Vision 21 from 2006 to 2015. Overall spending on water pollution control was some USD6.0billion in 2004 (including industrial and O&M). Green Vision 21 aims for 95% access to piped water nationally and 80% sewerage and 80% sewage treatment by 2011, with a higher rate for urban areas.

**Development of water sewerage systems**

	People served (million)		System capacity 1000 gallons/day)	
	Water	Sewerage	Water	Sewerage
1995	38.82	24.42	22.91	11.45
1997	39.61	28.60	23.96	15.04
1998	40.19	31.10	25.70	16.62
1999	40.95	32.54	26.59	17.71
2000	47.93	33.84	26.34	18.40

The figures below are from the 1997 interim assessment.

	Piped Water	Potable Water	Sewage Treatment
1995 (actual)	83%	43%	45%
2001 (planned)	90%	85%	65%
2011 (forecast)	95%	90%	80%

In 2005 the sector was restructured to create seven full water services public companies: KOWACO (national), Seoul, Pusan, Incheon, Daejeon, Daegu, and Gwangju. This aims to enable the Korean water services industry create players in the market to compete with companies active in Asia. However, institutional settings to support the restructuring are weak, with issues such as water pricing, reduction of water leakage, and systematic management of water supply still needing technical as well as institutional support.

<b>Internal freshwater resources</b>	
Annual availability (2007)	65 km <sup>3</sup>
Per capita (2008)	1,334 m <sup>3</sup>
Annual withdrawal (2007)	28.7%
Domestic (2007)	36%
Industrial (2007)	16%
Agriculture (2007)	48%

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	66.1
Per capita (1998, m <sup>3</sup> )	2,887
Withdrawals (1992, km <sup>3</sup> )	23.7
For domestic use (1987)	26%
For industry (1987)	11%
For agriculture (1987)	63%

**PSP prospects**

Private sector involvement and funding in the construction of water treatment facilities was permitted in 1994. This has been extended to allow BOT contracts, including foreign companies if they work in partnership with Korean companies. VE and Suez have gained sewage treatment contracts, VE has also gained a comprehensive effluent management contract with Hyundai, its South Korean partner company. VE anticipated being involved in the construction of 26 sewage treatment works for a total of USD1billion. The two contracts signed to date involve USD344million of capital spending. While water treatment plants have yet to be privatised, this remains possible. Water treatment plants built by Degrémont account for 20% of drinking water in Seoul and 80% of Busan's.

<b>Groundwater</b>	
Withdrawals (2005, km <sup>3</sup> )	3.7
For domestic use (2000)	48%
For industry (2000)	6%
For agriculture (2000)	45%

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Seoul	9,645,000	9,545,000	PSP under consideration
Pusan	3,554,000	3,534,000	Sewage treatment PPP
Inchon	2,620,000	2,712,000	Sewage treatment PPP
Taegu	2,511,000	2,551,000	PSP under consideration
Taejon	1,453,000	1,516,000	N/A
Kwangchu	1,436,000	1,449,000	N/A
Songnam	955,000	994,000	N/A
Ulsan	1,056,000	1,097,000	N/A
P'ohang	790,000	1,275,000	N/A
Puch'on	745,000	724,000	N/A
Suwon	1,168,000	1,511,000	N/A
Ansan	984,000	2,230,000	N/A

### City Study: Seoul

20million people live in Seoul and the Han River basin, accounting for nearly half of the country's population. Industrial development and population increases resulted in a consistent decline in raw water quality for the Seoul between 1990 and 1997. The 1997 Act relating to Water Resource, Water Quality Improvement and Local Resident Support in the Han River watershed was implemented to improve the quality of water entering the Paldang reservoir and the Han River, which supply 12million tonnes of water per day to the city. Between 1998 and 2005, USD 5.19 billion was spent on a comprehensive upgrading of the city's wastewater treatment. A further upgrading programme is in place from 2010 to 2012 with the aim of making both banks of the Han River suitable for recreation.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Kumdan	20 year sewage treatment BOT	VE/Hyundai (Korea)
Inchon	20 year sewage treatment BOT	VE/Hyundai (Korea)
Pusan	28 year sewage treatment BOT	Suez/Hanwha (Korea)
Yangju	24 year sewage treatment BOT	Suez/Hanwha (Korea)

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Suez	Suez (France)	0	900,000	900,000
VE	VE (France)	0	410,000	410,000

Source:

MOCT (2007) *Water Resources in Korea 2007*, MOCT, Seoul

## SRI LANKA

### Management

In 1980, the National Environment Act (NEA) was passed and the Central Environment Agency (CEA) was formed. The CEA was given enforcing powers through an amendment of the NEA in 1988, which has been exercised since 1990. The drinking water supply system is managed by the National Water Supply and Drainage Board (NWSDB). NWSDB is run on a commercial basis and currently operates 287 water supply schemes.

### Water investments and plans

The Government has set a target of total coverage by water supply and sanitation by the year 2010 through its National Programmes. This was revised to 85% access by 2010 in 2005. Water supply had reached 70% coverage by 1994, with sanitation at 50% coverage by the same time. In rural areas sanitation projects are implemented by different agencies with donor assistance, while urban areas have been somewhat neglected. 3.7million people (21%) live in the urban areas in Sri Lanka, of which an estimated half resides in the low income settlements. The infant mortality rate in these areas is between 32 to 54 per 1,000 live births, compared to the national average of 19.4%.

Proposals for new investments average USD61 per capita in the Western Region (including the capital, Colombo) which already has the highest existing sewerage coverage of 73%, whereas per capita investments in the Southern Region, for example, are proposed at USD8 per capita which presently has only a 47% coverage.

	Monthly consumption (m <sup>3</sup> )		Monthly bill (RS)	
	2000	2001	2000	2001
Greater Colombo	22.40	21.95	199.62	235.17
Regions	17.70	16.50	113.02	125.67
Average	19.67	19.15	154.27	178.95

Revenue collection started in 1982 and since the 1990s, these have been used to encourage water conservation. As a result of the progressive billing scheme, per capita daily consumption has decreased from 200L per day in 1995 to 140L in 2003 with the medium term of reducing this to 100L. Tariff collection rates between 1993 and 2001 have been between 89% and 99%.

Non revenue water, 2001	NWSDB overall	Colombo City
Leakage	23%	25%
Free supplies (standpipes)	4%	15%
Illegal connections	4%	8%
Metering errors	4%	5%
<b>Total</b>	<b>35%</b>	<b>53%</b>

### PSP pondered

The World Bank is seeking to reform the water sector, along with private sector participation, so as to achieve the Sri Lankan Government's aim of "safe drinking water for all" by 2010. This would require an annual investment of USD200million for 10 years. In 2003, the World Bank provided a USD39.8million grant for improving access to drinking water and sanitation for 940 villages in war-affected areas of Sri Lanka. Over the past 10 years, the annual allocation has been USD100million, of which USD80million had been annually disbursed.

Private sector involvement and finance ought to be mobilised according to the World Bank, with wealthier people, who are connected to the capital Colombo's sewerage system, being made to pay the O&M costs of a proposed new system, and not the state. In reality, this all-or-nothing approach towards PSP has probably resulted in the postponement of appropriate contracts being put into place. Instead of seeking O&M contracts for populations of 50-200,000 people, full concessions were sought in the Kalutara to Galle Coastal Strip project. As a result, while O&M contracts may be used in the medium term, concessions outside Colombo are unlikely before 2015-20. Currently, Manila Water Company (Ayala Corporation and United Utilities) is considering developing a suitable form of contract for 500,000 people in the Kalutara to Galle area, which requires some USD218million in investment.

In the meantime, NWSDB is considering the potential for outsourcing leakage detection and repair services, bill collection, new water connections and fleet management.

The Water Services Reform Bill was introduced in November 2003. However, The Alliance for the Protection of Natural Resources and Human Rights challenged it in the Supreme Court, which has effectively blocked the Bill, saying that it must be approved by all provincial councils. The main opposition party, the People's Alliance (PA), is in power in six of the seven provincial councils currently functioning.

### **A lower key approach**

The National Water Supply and Drainage Board (NWSDB) is seeking a lower key approach to involving the private sector through developing community-based, demand-driven water supplies, along with introducing cost recovery to operate and maintain the water distribution systems and finally expanding township and urban water supply delivery through public-private partnerships.

In 2004, 3,500 people living in Halgahakumbura, a tenement garden of Colombo had the management responsibility for the operation of their water supplies handed over to Petra Engineering Services Ltd. Instead of using a stand pipe for free, they pay for piped water. The private operator buys the bulk water from the NWSDB. The project has been a success to date, with strong demand to pay for the improved service. The aim is for the NWSDB to replicate what they have called the pro-poor PPP (5P) model in some of the other 1,500 tenement gardens in Colombo, which are currently served by free water.

<b>NWSDB</b>	<b>1995</b>	<b>2005</b>
Connections	323,000	907,622
Water supplied (million m <sup>3</sup> pa)	275	393
Revenue billing (SLRmillion)	1,524	5,839
Revenue collection (SLRmillion)	1,447	5,972
Funding - local (SLRmillion)	2,042	7,566
Funding - foreign (SLRmillion)	1,724	5,082

The 2005 capital expenditure was LKR12,648million, with the locally funded component accounting for some 40% of the total spent.

The 2002 Water Supply and Sanitation Policy has never been approved and the Government has since prepared new draft versions of separate national water and sanitation policies. Due to public borrowing constraints, about 50% of the funds needed in the water sector up to 2010 were expected to come from the private sector, but there is no evidence of this having taken place. Various forms of public-private partnership are being invited by the Government to operate, maintain and extend water sector systems.

Over the last few years, the Government has considered implementing two private sector participatory contracts to operate WSS services in the town of Negombo, north of Colombo, and along the coastal strip from Kalutara to Galle to provide 95% coverage based on private taps and to provide improved sanitation.

Funding requirements for the water sector for 2000-2010 were estimated by NWSDB at LKR85billion. Water sector funds available from the Government over that period were estimated to total only LKR45billion due to constraints imposed by the capacity for public sector borrowing. To fill the funding gap, the private sector has been invited by the Government to invest in water supply in order to mobilize long-term multilateral funds designated for the private sector. More recently, the sectoral public investment program for the 10-year period from 2006 to 2016 has been estimated at LKR135.98billion.

#### *Sources:*

*ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Sri Lanka, ADB, Manila*

*Mahinda Chintana: Vision for a New Sri Lanka, A Ten Year Horizon Development Framework 2006 – 2016*

*MPF (2006) Discussion Paper, p. 87, Department of National Planning, Ministry of Finance and Planning, 2006*

*World Bank (2006) Poverty Dimensions of Water, Sanitation and Hygiene in South West Sri Lanka, Water Supply and Sanitation Working Note No. 8, February 2006, World Bank*

**TAIWAN**

<b>Economics (2006)</b>	
GNI per capita	USD14,059
GNI per capita (PPP)	USD27,600
Agriculture	2%
Industry	23%
Services	69%

After Japan, Singapore and Hong Kong, Taiwan vies with South Korea as the most developed of the Asian economies. It also resembles South Korea in recently unveiling a cautious liberalisation programme that intends to encourage international investment in water and sewerage infrastructure development and services operation in the medium term. The first BOT infrastructure contracts of any kind were awarded in 1997, with the first such contract for bulk water provision being awarded in 2002. There are currently no plans for state sales of water concerns.

<b>Population</b>	
2009 (million)	23.2
2020 (million)	25.0
Urbanisation in 2007	81%
Urbanisation by 2020	N/A
Urbanisation by 2050	N/A

**Organisation and regulation**

The Ministry of the Interior is responsible for sewers, with the Central Government looking after the financing. The Taiwan Water Supply Corporation is in charge of overall water supply, while the Taipei City Water Supply Department looks after Taipei. The Water Resources Planning Commission reports to the Environmental Protection Administration (EPA), which in turn asks the Government for funding and advises on spending priorities. Construction is approved on a local basis. The two main items of legislation are the Water Pollution Control Act, 1974 (revised in 1991) and the Drinking Water Management Act, 1991 (revised in 1997), along with various Regulations on effluent standards passed between 1988 and 1997. The monitoring of water availability and its use is of a high quality. This reflects the potential constraints that Taiwan's water resources may impose on economic growth and rising consumer expectations.

Actual regulation was marked by a progressive relaxation of effluent limits in the mid 1990s in order to stimulate economic development. Nevertheless, the market for pollution control equipment in the country has been growing at 6-7% pa between 1996 and 1999. The EPA carries out end of pipe audits of industrial discharges. They have resulted in 11,000 fines between July 1994 and June 1998 for violations of effluent discharge limits.

<b>Urban Data (2009)</b>	
With improved drinking water	N/A
With household drinking water	N/A
With improved sewerage	N/A
With household sewerage	23%
With sewage treatment	48%

**Water resources**

3,156m<sup>3</sup> per capita pa of water is available, of which, 28% is currently utilised. Water distribution losses are estimated at 20%. 20% of the population relies on groundwater as the primary water source. 78% of rainfall takes place between May and October. The maximum potential for sustainable water abstraction is estimated at 20billion m<sup>3</sup> pa, without further infrastructure development. Investment in water provision and distribution accounted for 0.87% of GNP from 1953-1992.

Groundwater supplies between 21% (wet year) and 41% (dry year) of water needs. Groundwater shortage in Taipei and the city Kaohsiung affect industrial concerns as almost all the domestic water



for these cities is obtained from river water. Reservoirs supply 18 – 20% of needs depending on the level of rainfall, having a total capacity of 2.1km<sup>3</sup>.

### Water demand forecasts

#### Water resources, supply and demand (million m<sup>3</sup>)

	1991	1995	2000	2001	2002	2003	2004
Surface water	N/A	N/A	5,674	5,488	5,437	5,382	5,543
Ground water	N/A	N/A	12,146	12,998	13,264	12,219	12,247
<b>Total</b>	<b>17,675</b>	<b>18,919</b>	<b>17,820</b>	<b>18,486</b>	<b>18,701</b>	<b>17,601</b>	<b>17,790</b>
Agriculture	13,554	14,546	12,317	13,012	13,410	12,434	12,604
Domestic	2,493	2,747	3,633	3,734	3,525	3,559	3,532
Industry	1,628	1,626	1,870	1,740	1,766	1,608	1,654

Source: *Statistic of Water Resources, Water Resources Agency, MEA, Taiwan, 2005*

Total extraction of water was 19.5km<sup>3</sup> pa in 1997, and is forecast to rise to 21.2–23.0km<sup>3</sup> by 2036. Domestic water consumption accounted for 2.4km<sup>3</sup> in 1997, and is forecast to rise to 4.2–5.0km<sup>3</sup> by 2036, while industrial water consumption accounted for 1.7km<sup>3</sup> in 1997, and is forecast to rise to 2.0–3.0km<sup>3</sup>. Use of water in agriculture is expected to be constant at 15.4km<sup>3</sup>. These forecasts point to an excess in demand over currently sustainable resources of 1.2–2.0km<sup>3</sup> per annum by 2036. While distribution losses can be reduced from their current level of 20% to perhaps 15-18%, further development of the country's reservoirs and bulk water supply network looks necessary in the longer term.

Internal renewable resources	
Total (1998, km <sup>3</sup> )	64.5
Per capita (1998, m <sup>3</sup> )	2,972
Withdrawals (1997, km <sup>3</sup> )	13.5
For domestic use (1997)	13%

### Development of water services

Access to piped water rose from 69.5% in 1981 to 84.2% in 1991. In 1996 water utilities in Taiwan provided 8.45million m<sup>3</sup> of drinking water per day to 15.33million people. Domestic usage rose from 66m<sup>3</sup> per capita per annum in 1977 to 121m<sup>3</sup> per capita per annum in 1995.

### Water quality standards

Drinking water quality is assessed under Article 11 of the 1997 Drinking Water Management Statues. 15,000 samples per annum are taken. Until recently, source contamination had caused some deterioration in water quality.

#### Drinking water quality:

1991	98.17% pass
1995	95.72% pass
2000	98.85% pass
2002	99.67% pass
2004	99.52% pass
2006	99.54% pass
2007	99.58% pass
2008	99.47% pass

Over-abstraction of groundwater has resulted in saltwater ingress, while river quality has declined because of uncontrolled discharges. Under the the National Environmental Protection Plan, targets were 97.68% for 2001, 98.34% for 2006 and above 99.00% for 2011.

**Effluent treatment**

Year	Municipal sewage	Industrial wastewater	Agricultural effluent	Total
1994	9.2%	76.3%	43.4%	49.0%
2000	15.9%	73.2%	64.9%	52.5%
2005	25.8%	77.2%	71.0%	58.3%
2006	30.1%	76.9%	79.6%	62.0%
2007	34.5%	77.3%	63.6%	59.1%
2001 EP	18.3%	81.0%	49.6%	60.4%
2006 EP	29.3%	81.8%	51.8%	63.6%
2011 EP	37.7%	81.8%	53.1%	65.7%

EP – National EP Plan targets.

**Sewerage infrastructure**

At a national level, 7% of sewage was treated in 1996, all of this being in Taipei. In 2007, this had increased to 15.6% nationally; 11.3% to the sewerage network and 6.8% to in-house sewage treatment systems. In 2009, 23.0% of households were connected to the sewerage network with 38.3% of effluents being fully treated; 23.0 via sewerage, 11.4% from in-house facilities and 13.9% via community underground systems. Taipei's main sewage treatment work offers primary treatment (5% of sewage), with the remaining 2% treated by two 20 year old secondary STWs and two small tertiary STWs. The EPA has drawn up a three-stage plan for treating up to 70% of the country's effluent load. Phase 1, covering Taipei will result in 17% of sewage being treated. The official target for Phase 2 was for 40% of sewage effluents to be treated by 2000. This is currently running some years behind schedule, with the 1998 National Environmental Protection Plan aiming for 26% of sewage to be treated by 2011 and 7% of effluents treated in 2001. The main period of construction is expected to be from 2003 to 2010. The EPA's long-term (Phase 3) aim of reaching 60-70% sewage treatment is now unlikely to be attained until 2015-20. Phase 2 includes covering Kaohsiung and 11 other areas, while Phase 3 plans to extend to Taichung (0.84million people). Phase 3 has not yet been formally approved and requires financing to be organised.

**Sewage treatment plan**

Phase	Cost (TWD)	Capacity (m <sup>3</sup> / day)
1	40billion	1.3million
2	106billion	2.2million
3	TBA	1.8 – 2.6million

**Integrated plan for modernization of drinking water infrastructure**

Major Plan	Itemized plan	Period	Amount (billion NTD)
Pipeline connection	Pipeline connection	2007-13	15.3
Water treatment	New plant	2007-14	26.9
	Upgrading work	2007-16	3.0
	Advanced treatment	2007-16	32.8
<b>Total</b>			<b>63.3</b>
Pipeline renewal	Small districts	2007-16	3.0
	Pipeline replacement	2007-16	44.0
	GIS installation	2007-16	3.0
<b>Total</b>			<b>50.0</b>
Monitoring		2007-16	4.5
Others		2007-09	0.4
<b>Grand Total</b>			<b>133.5</b>

25% of the plan will be funded by tariffs, with the rest coming from subsidies.

### Improving river water quality

Since 1998, the Bureau of Water Resources has overseen the development of five water quality protection zones. The river basins involved provide water for 14million people. The River Basin and Marine Management Plan will cost TWD147.1billion and run from 2001-11. The 1998 National Environmental Protection Plan sets river water quality targets until 2011.

### River water quality

Year	Not polluted	Lightly polluted	Moderately polluted	Heavily polluted
1994	63.3%	12.3%	11.1%	13.3%
2000	63.6%	12.0%	12.3%	12.1%
2005	64.2%	9.9%	19.7%	6.2%
2006	65.5%	9.0%	19.5%	6.0%
2007	61.8%	7.9%	23.6%	6.7%
2008	65.2%	9.0%	21.5%	4.2%
2009	67.2%	8.1%	18.9%	5.9%
2001 EP	>65.0%	N/A	N/A	<11.9%
2006 EP	>68.0%	N/A	N/A	<10.0%
2011 EP	>70.0%	N/A	N/A	<7.9%

Industrial effluent discharges fell by 20% from their 1987 levels in 1993 and by 85% by 2005. In 2001, 35% of rivers were of bad to fair quality.

### Policy implementation

At present there are no fees for wastewater discharge. Industrial effluent has been charged since 2002, while there are no current plans to charge domestic customers.

Groundwater resources	
Total recharge (1998, km <sup>3</sup> )	4.0
Per capita (1998, m <sup>3</sup> )	184
Withdrawals (1997, km <sup>3</sup> )	6.0
For domestic use (1997)	2%

### Private sector opportunities

The sale of stakes in water and sewerage entities remains some years away. Sewerage is currently being considered for PSP, probably during the next 5-10 years. Water supply is unlikely to be privatised for 10-20 years. In the meantime, the first bulk water provision PSP award was made in 2002 to Suez.

MAJOR CITIES			
Population	2005	2015	Status
Taipei	2,473,000	2,447,000	PSP probable in the medium to long term
Kaoshiung	1,506,000	1,620,000	Suez, water treatment

### City study: Taipei

Water supply and sewerage services in the metropolitan area are run by the Taipei City Water Department. All 1,189,095 households were connected to the water supply in 1993. Water use was 675million m<sup>3</sup> pa, with an average daily consumption of 281L per capita. The water tariff operates on a sliding scale with an average tariff of USD0.244 per m<sup>3</sup> with charges increasing above 10m<sup>3</sup> pa, with no surcharge for sewerage services. All properties are metered. Distribution losses are estimated at 24%. Seven water treatment works treat 2.74million m<sup>3</sup> per day, Chitan IV being completed in 2001, with a capacity of 0.5million m<sup>3</sup> per day. A further facility (Chitan V) will be constructed by 2011.

Sewage effluents total 0.68million m<sup>3</sup> per day or 247million m<sup>3</sup> pa, 93% of which comes from domestic sewage, via 422,379 septic tanks, with the remaining 30% of the city connected to mains sewerage. By 2002, 59% of households were connected to mains sewerage.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Kaohsiung	17 year water treatment BOT	Ondeo
Hsin Chu	WWTW, with 5 year O&M	Darco

In 2002 the Taiwan Water Supply Corporation awarded Suez and Ecotek (China Steel of Taiwan) a contract for the overhaul and operation of a drinking water plant in Kaohsiung. The contract is worth EUR200million, of which Ondeo Degrémont's share is EUR90million, covering equipment overhaul, building new facilities and operating the new plant for a period of 15 years. The facility produces 450,000m<sup>3</sup> of drinking water per day. While the city has 1.5million people, the facility will also serve a further 1.5million living in outlying towns and suburbs.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Ondeo	Suez (France)	3,000,000	0	3,000,000
Darco / Leader	Darco Water Technology (Singapore)	0	300,000	300,000

At the end of 2007, there were 30 sewerage systems in operation in Taiwan, with 51 under construction. 96 further projects were at the post planning stage and 15 at the planning stage. Three of the projects under construction were BOT projects, along with 33 of the projects at the pre-construction stage:

#### Under construction

Taipei County	Tamsui
Kaohsiung City	Nanzih
Yilan County	Loudung Area

#### In development

Taipei County	Banshin (Shanshia), Banshin (Yingge), Rueifang Township
Taoyuan County	Banshin (Pudin), Taoyuan Area, Jungli Area
Miaoli County	Junan Toufen
Taichung County	Fengyuan City
Taichung City	Taichung City's 3rd phase
Nantou County	Puli Township, Tsautuen Township, Jushan Township, Nantou City
Chunghua County	Hemei Township, Lukang Fushing, Chunghua City
Yunlin County	Dounan Township, Beigang Township
Chiayi City	Chiayi City
Chiayi County	Taibau City
Tainan City	Tainan City (Yanshuei, Tainan)
Tainan County	Jiali Township, Gueiren, Yungkuang
Kaohsiung County	Shilong River (Dashe Renwu), Daliau Township, Chiautou, Gangshan
Pingtung County	Donggang River Basin (Neipu)
Taitung County	Taitung City
Penghu County	Magung Area
Hualien County	Yuli Township

**Note:** The United Nations and the World Bank does not recognise Taiwan's separate existence (while doing so for Hong Kong), so the economic and population data used is not strictly comparable with the rest of this publication. ROC Government and EPA statistics have been used (yearbooks and from their respective web sites).

**THAILAND**

<b>Economics (2008)</b>	
GNI per capita	USD3,670
GNI per capita (PPP)	USD7,770
Agriculture	12%
Industry	44%
Services	44%

**Government departments and law**

Thailand's first environmental law, The Enhancement and Conservation of National Environmental Quality Act, was passed in 1975, creating the National Environment Board (NEB) and the Office of National Environment Board (ONEB). This act was amended twice in 1978 and 1979, transferring the supervision of the Office to the Ministry of Science, Technology and Energy. These acts had limited effect and in 1992 the 'Enhancement and Conservation of National Environmental Quality Act' (NEQA) of 1992 (B.E. 2535) was passed. This new law created three environmental organisations: the Office of Environmental Policy and Planning (OEPP), the Pollution Control Department (PCD) and the Department of Environmental Quality Promotion (DEQP). These three organisations are mandated to promote the effective implementation of policies, plans and strategies at both national and local levels as well as the enforcement of laws and regulations. In consequence, the Ministry of Science, Technology and Energy changed its name to the Ministry of Science, Technology and Environment (MOSTE). Water policy is enforced by MOSTE, which includes the Wastewater Management Authority and the Department of Environmental Quality Promotion and the Pollution Control Department.

<b>Population</b>	
Total 2009 (million)	67.8
Total 2020 (million)	71.0
Urbanisation in 2008	33.3%
Urbanisation by 2020	38.9%
Urbanisation by 2050	60.0%

**Management**

Water is managed through the Metropolitan Waterworks Authority (MWA, for Bangkok) and the Provincial Waterworks Authority (PWA, for the rest of Thailand).

**Water services**

<b>2001</b>	<b>Produced</b>	<b>Sold (million m<sup>3</sup>/day)</b>	<b>Connections (million)</b>
MWA	1,415	857	1.45
PWA	704	474	3.0

USD700million was spent linking three rivers in eastern Thailand to provide 504million m<sup>3</sup> of water by 2006 with the aim of 647million m<sup>3</sup> by 2016, compared with current resources of 300million m<sup>3</sup> a day. In addition, the PWA seeks to upgrade 230 water treatment works for THB35billion (USD945million).

<b>Urban Data 2004</b>	
With improved drinking water	99%
With household drinking water	85%
With improved sewerage	95%
With household sewerage (2004)	N/A
With 2 <sup>0</sup> sewage treatment	12%

## Water provision and pollution

The MWA served 4.5million people in Bangkok in 1991, with 79% of the city area covered. In 2001, the MWA served 6million people, or 75% of the population within its coverage area. Poor water treatment facilities mean that water has to be boiled or filtered before use and 20% of the population use bottled water instead. 31% of water is lost due to leakage. The PWA served 3.7million people in 1991, rising to 10million by 2001.

Rural water provision remains a problem, with widespread seasonal scarcity. Water shortages affected 1,369,437 families, or 6,350,356 people, in 364 districts of 44 provinces in early 1999, according to the interior ministry. This compared with shortages affecting 228,664 families or 945,425 people in 300 districts of 42 provinces in 1998.

In 1998, the Pollution Control Department found water quality in 33% of major rivers to be polluted, while 18% were in good condition.

<b>Internal freshwater resources</b>	
Annual availability (2007)	210 km <sup>3</sup>
Per capita (2008)	3,332 m <sup>3</sup>
Annual withdrawal (2007)	41.5%
Domestic (2007)	2%
Industrial (2007)	2%
Agriculture (2007)	96%

<b>Freshwater</b>	
Total (1998, km <sup>3</sup> )	110.0
Per capita (1998, m <sup>3</sup> )	1,845
Withdrawals (1990, km <sup>3</sup> )	33.1
For domestic use (1987)	5%
For industry (1987)	4%
For agriculture (1987)	91%

## PSP plans

In July 1998, the Government announced that the PWA would launch 12 major water PSP projects for bulk water supply, water treatment and water distribution in 10 provinces in the medium term and that further concessions for Bangkok are to be awarded. This project started in mid 1999, with the corporatisation of the PWA starting in 2000. Water competition for industrial customers was introduced in 2001, with a series of concessions from PWA gained by East Water's Universal Utilities.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	43.0
Per capita (1998, m <sup>3</sup> )	314
Withdrawals (1980, km <sup>3</sup> )	1.0
For domestic use (1980)	60%
For industry (1980)	26%
For agriculture (1980)	14%

## Companies noted

East Water (EW) remains the only private sector company entirely devoted to water activities. In addition to its current network expansion plans, the company seeks to be involved in the new PSP programme and is concentrating on gaining concessions in Bangkok. In 2000, it acquired Electricity Generating Pcl's 70% stake in Egcom Tara, a privately held water supply company. EW also has an industrial water JV with VE. Thames Water's water provision contract to northern Bangkok was extended in 1995 to cover additional water management operations.

<b>MAJOR CITIES</b>			
<b>Population</b>	<b>2005</b>	<b>2015</b>	<b>Status</b>
Bangkok	6,5934,000	7,439,000	Partial PSP

### **PSP moves unsteadily forward**

In July 2000, the State Enterprises Policy Committee (SEPC) rejected an application for a direct supplies concession for Thames Water and prohibited the Provincial Waterworks Authority (PWA) from offering any new private deals until the completion of a World Bank-sponsored review. The SEPC ordered the PWA to change its service concessions with Thames into turnkey construction contracts. Factories were not linked up to the privatised systems because they continued to use cheaper water from artesian wells. The PWA had already been forced to pay a private operator THB118million (EUR3.3million) compensation because of the resulting under-utilisation of the available capacity. The PWA has introduced a new method of calculating water bills by the end of the year to better reflect actual costs. PWA hopes the price increases will reduce the losses incurred from subsidising industrial water consumption and pave the way for eventual PSP. The authority also plans a nation-wide overhaul of water systems to reduce unaccounted for water levels from the current 35.6% to 25%.

In 2004, it was announced that the Government was considering an IPO of the MWA which in turn would be linked with one or more strategic partners. The PWA will meanwhile be split into four regional entities. The PWA PSP is worth an estimated USD1billion. The MWA will be split into West and East Bangkok zones, which generated combined revenues of USD385million in 2002.

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Egcom Tara	East Water (Thailand)	N/A	0	<b>N/A</b>
East Water	East Water (Thailand)	600,000	0	<b>600,000</b>
Pathum Thani	Thai Tap (Thailand)	800,000	0	<b>800,000</b>
Bangkok	Thai Tap (Thailand)	400,000	0	<b>400,000</b>
VE	VE (France)	N/A	0	<b>N/A</b>

### **Paying for sewerage**

Domestic and business customers were charged for wastewater treatment for the first time in 2003, via a service fee. The rate was set by the Drainage and Sewerage Department: THB2 (EUR0.04) per m<sup>3</sup> of water for household use, THB4 (EUR0.08) for hospitals, markets, department stores and hotels, and THB8 (EUR0.16) for industrial use. Households, state agencies and state enterprises would not pay the fee for the first 10m<sup>3</sup> of water each month. The cost per household was estimated at THB60 (EUR1.23) a month for treatment. The fee will be phased in over three years to minimise this, starting with THB1 (EUR0.02) per m<sup>3</sup> for households in the first year.

<b>Listed water &amp; sewerage service companies</b> (Please see company section for details)		
<b>Company</b>	<b>Activities</b>	<b>Region</b>
Eastern Water	Water distribution concessions	Eastern seaboard
Thai Tap	Water distribution concessions	

### **Corporate malpractice concerns**

The USD750million Samut Prakarn wastewater management project has been put on hold due to concerns about the lack of transparency. Concern has been raised about the emphasis on post hoc effluent treatment rather than concentrating on sources of industrial pollution. At the same time, the consultation process failed to meet with the Asian Development Bank's guidelines for good practice, while the operators were unable to demonstrate suitable technical capabilities.

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Bangkok	30 year BOT, water distribution	Thai Tap
East seaboard	Water provision to seven provinces	Eastern Water
Lampang	THB800million water supply project	Eastern Water/VE
North Bangkok	Water management	Thai Tap
Ratchaburi	THB690million water supply project	Eastern Water

Source:

*Brown, S. (2002). Asia Water 18 (3) p 9-13*



**TRINIDAD AND TOBAGO****The Trinidad and Tobago Management Contract**

The Water and Sewerage Authority of Trinidad and Tobago (WASA), provides water and sewerage services to the island's 1.27million people. In 1996, piped water was available for less than twelve hours a day, distribution losses were about 50% and 1% of the 240,000 customers were metered. The sewerage system served only 30% of the population. Until the mid-1980s, the government had not raised rates for fifty years and by the end of 1992, it had accumulated losses of USD800million.

Water coverage	1970	1990	1994	2000	2004
Access to improved water	93%	92%	98%	88%	91%

Source: WHO assessments, 1970-2004

In 1994 the Government decided to adopt a phased PSP strategy for the service. Since developing a concession would take too much time in the run up to the 1995 general elections, a two-phase strategy was adopted. In the first phase, WASA would contract a private operator to provide a management team to meet operational, maintenance, and investment targets and follow an agreed business plan over the term of the agreement. A management contract was chosen because of the poor quality of operational information available, undeveloped institutional arrangements and the potential for slow legislative change. Management contracts were seen to be the most flexible way of allowing the authorities to gain hands-on experience of private sector contracts in the sector. During the five years of this contract, a concession contract would be developed.

**WASA, service delivery, 2001**

24 hours per day	14%
5 – 7 days per week	32%
3 – 5 days per week	13%
2 – 3 days per week	18%
Less than 2 days per week	13%
Pipe but no water	4%
No pipe	6%

Source: UNDP (2005) *Sharing Innovative Experiences, Vol 11, Examples of Successful Experiences in Providing Safe Drinking Water*

The contract covering water supply, sewerage and sewage treatment and disposal was awarded in 1996 to a JV between Severn Trent, WASA and the Government of Trinidad and Tobago. The contract allowed for Severn Trent to negotiate a follow-on contract within a specified time limit after which it becomes open to all. The process was supported by a USD80million loan from the World Bank, designed to assist the development of conditions suitable for private sector participation.

WASA increased tariffs by 35% for customers receiving water for more than twelve hours a day so as to encourage the private sector operator to expand coverage and ensure a reliable service. The tariff increase was introduced in 1995. This timing was meant to separate the two events, to ensure that the politics of the increase would not sour the arrival of the new operator in the eyes of the public. The contract was politically contentious during its five year life, not least because there was a certain comfort to be found in providing a cheap but substandard service. The contract ended in April 1999.

In 2003, the Inter-American Development Bank supported a proposal for a 25 year concession for water and sewerage services. The contract award process has yet to be started. It is understood that this will involve an operating company with 60% of its equity being locally owned, 30% by an international company and 10% by Government employees.

**UNITED STATES OF AMERICA**

<b>Economics (2008)</b>	
GNI per capita	USD47,930
GNI per capita (PPP)	USD46,790
Agriculture (2007)	1%
Industry (2007)	22%
Services (2007)	77%

**Regulatory background**

The Environmental Protection Agency (EPA) implements a series of regulatory programs under the Clean Water Act (CWA) and the Safe Drinking Water Program. The Federal Water Pollution Control Act, or Clean Water Act (1948, last amended 1987) seeks to maintain the "chemical, physical, and biological integrity of the Nation's waters." Under the Clean Water Act all discharges to surface waters of the U.S. must be treated to the level of secondary treatment. The Safe Drinking Water Act (SDWA), amended 1996, requires the EPA to set standards for contaminants in drinking water, monitor drinking water quality, and carry out compliance and enforcement actions. By the mid-1980s the federal government had spent USD400billion on water resource development. From 1972 to 1998 compliance work for the Clean Water Act was supported by USD68billion in federal assistance for the construction of local wastewater treatment systems, while state and local governments contributed a further USD20billion.

**US drinking water pipe classification, 1980–2020 (%)**

<b>Condition (%)</b>	<b>1980</b>	<b>2000</b>	<b>2020</b>
Excellent	69	43	33
Good	19	17	11
Fair	3	18	12
Poor	3	14	13
Very poor	2	2	23
Life elapsed	5	7	9

Source: US EPA 2002

**Service provision**

740,000 people lacked access to potable water in 1999. A USD210million project was launched in 1999 to rectify this through direct investment in suitable distribution facilities. US Environmental Protection Agency (EPA) standards were being met or exceeded by more than 90% of water utilities in the USA in 1999. These guideline standards are being revised to bring them in line with WHO standards. In Western Europe, similar compliance figures are typically in the 95-99% range. In 1994, 19% of the population (45million people) was served at some point during the year with substandard water in terms of bacterial or chemical pollution. In September 2006, the US EPA proposed that community water systems (serving more than 25 people) should seek to 91% compliance with drinking water standards by 2011 rather than their previous target of 95% by 2008. In 2005, 88% of community based water supplies met the applicable health standards.

**US non-compliant water supplies, 2008**

<b>Systems reporting violation</b>	<b>Population affected (million)</b>	
Total microbial levels	19,624	18.0
Arsenic	1,602	4.1
VOCs	1,840	7.2
Lead & copper	8,090	20.8
Nitrate / nitrites	6,806	8.9
All violations	20,797	83.4

Source: US EPA (2008) FACTOIDS: Drinking Water and Ground Water Statistics for 2008

Lead in drinking water has only recently become an area of concern. The proposed Lead-Free Drinking Water Act of 2005 is the first major effort to amend the SDWA in 15 years. It would require the EPA to re-examine and if necessary, revise the national safety standard for lead in drinking water, requiring all water utilities to test for lead. After the initial test, the nation's utilities would have to test their lead levels every six months, whether they detect a problem or not. According to the EPA, 4% of utilities that serve more than 50,000 people have excessive levels of lead. The proposed law could result in spending USD500billion in 20 years to restructure the 1974 Safe Drinking Water Act and the 1991 amendments. If Congress approves the bill, USD200million will be appropriated every year for four years to help replace lead-contaminated water lines.

<b>Population</b>	
Total 2009 (million)	314.7
Total 2020 (million)	338.4
Urbanisation in 2008	81.7%
Urbanisation by 2020	84.9%
Urbanisation by 2050	90.4%

### Water quality

Overall, 50% of the country's 2.4million km of streams and an unknown percentage of the nation's groundwater are polluted to a significant degree. In 1996, 19% of the USA's 3.6million miles of rivers were surveyed. 56% of the rivers in terms of river length were regarded as being of good quality and 8% of fair quality. Some form of pollution or habitat degradation impairs the remaining 36% of the surveyed river miles. Excess levels of nitrates and phosphates were noted in 14%, with high bacterial levels in 12%. Agricultural waste was noted in 25% and runoffs from municipal sewage treatment plants in 5%, with urban runoff and storm sewers affecting a further 5%. Urban sewerage and sewage treatment is generally well developed. In contrast, smaller communities have been poorly served to date and many municipally run facilities are understood to be in poor condition.

### Sewage treatment development

	<b>1982</b>	<b>1984</b>	<b>1992</b>	<b>1996</b>	<b>2000</b>	<b>2004</b>	<b>2008</b>
Tertiary	22.8%	27.4%	32.0%	33.0%	40.1%	42.0%	43.0%
Secondary	25.0%	23.0%	25.0%	24.0%	31.3%	32.9%	30.7%
Primary	14.0%	13.0%	18.0%	18.0%	2.3%	1.1%	1.3%
Connected	64.0%	63.0%	75.0%	75.0%	73.7%	76.1%	75.0%

Source: US EPA (2010) Clean Watersheds Needs Survey 2008

According to the American Society of Engineers (ASCE), by 2003 there was an annual shortfall of USD11billion for replacing or rehabilitating water and wastewater facilities in the United States. The overall condition and performance of the country's drinking water and wastewater systems has worsened since the previous evaluation by ACSE in 2001. Currently, the federal government spends about USD2.5billion annually for drinking water and wastewater treatment facilities. The proposed federal budget for FY 2004 includes a USD360million cut in wastewater funding, while the level for drinking water spending remains unchanged. The EPA anticipates that the percentage of the population receiving sewage treatment will increase from 66% in 1996 to about 88% by 2016.

<b>Urban Data (2008)</b>	
With improved drinking water	100%
With household drinking water	97%
With improved sewerage	100%
With household sewerage (2004)	95%
With 2 <sup>0</sup> sewage treatment	80%

### Market size (from various reports, 2002-04)

There is a market for operating water and sewerage services worth USD47-53billion per annum. The market for water supply to households (110million households at an average of USD300 per annum) in the USA is worth USD33billion pa. This excludes sewerage services.

<b>USbillion pa</b>	<b>High</b>	<b>Low</b>	<b>Mean</b>
Water – O&M	32.7	25.7	29.2
Sewerage – O&M	30.8	21.4	26.1
Water – Capex	20.1	11.6	15.9
Sewerage – Capex	20.9	13.0	17.0
<b>Total</b>	<b>104.5</b>	<b>71.7</b>	<b>88.2</b>

Depending upon the source, replacing the USA's aging water and wastewater network and upgrading and extending treatment facilities in the United States is expected to cost USD550–1,000billion over the next 20 years. Government funding is anticipated to cover USD535billion over the next 20 years, according to the US Environmental Protection Agency Water Infrastructure Network. But as shown by the limited funds allocated since 1997, this is open to question, with the proportion of costs being covered by government funding falling from an average of 50% to an extreme of 10% in 2003. Since 2000, Government funding has resulted in a projected USD23billion pa shortfall over the next two decades. This has to be funded by municipalities, debt and innovative ways of delivering performance improvement.

#### **ASCE 'report cards' on US water and wastewater infrastructure**

	<b>1998</b>	<b>2001</b>	<b>2003</b>	<b>2005</b>	<b>2009</b>
Water	D	D	Down	D-	D-
Wastewater	D+	D	Down	D-	D-

*Sources: American Society of Civil Engineer's "Report Card for America's Infrastructure" for 1998, 2001, 2003, 2005 and 2009*

Another insight is provided from the US Conference of Mayors, cited in GWI (2007). This covers water and sewer spending and revenues in 2004-05:

<b>USDbillion</b>	<b>Water</b>	<b>Sewer</b>
Local government revenue	37.12	31.21
State government revenue	0.19	0.04
<b>Total revenue</b>	<b>37.32</b>	<b>31.25</b>
Local government expenditure	45.64	35.15
State government expenditure	0.32	1.12
<b>Total expenditure</b>	<b>45.96</b>	<b>36.37</b>

#### **Non-compliant water supplies**

<b>Systems Reporting Violation</b>	<b>Population Affected</b>
Coliform bacteria	12,246
Inadequate filtration	24.7m
Faecal bacteria	1,478
Lead	20.5m
Nitrate	2,726
Chemicals/pesticides	3,641
	5.0m
	0.5m
	0.9m

*Source: Environmental Working Group based on EPA data. US Water News January 1998*

The treatment of microbiological contaminants in water will require USD20billion, with 35% of surface water systems needing filtration equipment installation, upgrading or replacement. Water use rose from 1950 to a peak in 1980 and has declined since 1985 as various efficiency and cost accounting measures have made an impact.

<b>Billion US gallons per day</b>	<b>1980</b>	<b>2000</b>
Cooling water for power	210	195
Irrigation	150	137
Municipal	34	43
Other	46	33
<b>Total</b>	<b>440</b>	<b>408</b>

**The costs of compliance**

**US EPA Needs Assessments and related spending forecasts for drinking water infrastructure**

	<b>USDbillion</b>
EPA 1995 Needs Assessment	138 (166*)
EPA 1999 Needs Assessment	151 (167*)
EPA 2003 Needs Assessment	277
Water Infrastructure Network 1999 Estimate	420*
Congressional Budget Office 2002 Estimate	245 – 424*
US EPA 2002 Gap Analysis	170 – 493*

\* rebased to 2003 USDvalue

**Spending forecasts**

<b>Systems size</b>	<b>USDbillion</b>
Large systems (>50,000 people)	122.9
Medium systems (3,301 – 50,000 people)	103.0
Small systems (<3,300 people)	40.0
Arsenic Rule (effective from January 2006)	0.9
Other new Regulations	9.9

These assessments cover the period 2003 to 2025. USD45.1billion is accounted for by regulatory requirements, the rest by the need to expand and enhance service infrastructure. Regulatory-driven spending currently accounts for USD35.2billion (USD30.2billion of which is accounted for by microbiological standards), plus USD9.9billion for new regulations. These have been drawn up under the Safe Drinking Water Act (Amended 1996, SDWA), the Surface Water Treatment Rule (SWTR), the Interim Enhanced Surface Water Treatment Rule (IESWTR), and the Total Coliform Rule (TCR).

**US water works upgrade costs, 2005–25**

<b>Customers</b>	<b>USDbillion</b>		<b>Facilities</b>	
50,000 +	58.5	43%	800	2%
3,000 – 50,000	41.4	30%	6,800	13%
Up to 3,000	37.2	27%	46,000	86%
Total	137.1	100%	53,600	100%

Source: US EPA (2009) 2007 Drinking Water Infrastructure Needs Survey & Assessment, Fourth Report to Congress

**Total 20-year needs for state water systems (USDbillion)**

<b>People served</b>	<b>Distribution &amp; transmission</b>	<b>Treatment</b>	<b>Storage</b>	<b>Source</b>	<b>Other</b>	<b>Total</b>
100,000 +	72.5	26.6	9.9	6.5	0.9	116.3
3,301 – 100,000	91.5	29.8	15.9	7.1	0.8	145.1

Up to 3,300	34.7	10.3	8.5	5.2	0-6	59.4
Non community	0.5	8.5	1.9	0.8	0.0	4.1
Total	199.2	67.6	36.3	19.6	2.3	324.9

Source: US EPA (2009) 2007 Drinking Water Infrastructure Needs Survey & Assessment, Fourth Report to Congress

The economies of scale inherent with larger systems are reflected by the proportion of the total need by system size in relation to the proportion of the population they serve.

#### Need versus system size (%)

People served	% of need	% of systems	% of population
100,000 +	36%	1%	45%
3,301 – 100,000	45%	17%	46%
Up to 3,300	19%	82%	9%

Source: US EPA (2009) 2007 Drinking Water Infrastructure Needs Survey & Assessment, Fourth Report to Congress

Internal freshwater resources	
Annual availability (2007)	2,800 km <sup>3</sup>
Per capita (2008)	9,209 m <sup>3</sup>
Annual withdrawal (2007)	17.1%
Domestic (2007)	13%
Industrial (2007)	46%
Agriculture (2007)	41%

#### Sewerage and sewage treatment spending plans

The US need to invest an additional USD181billion for all types of sewage treatment projects eligible for funding under the Clean Water Act, according to the most recent needs survey estimate by the EPA and the individual States, completed in August 2003. The cost needed over the period from 1996 to 2016 to reach a universal level for secondary treatment (and where appropriate, tertiary treatment) has been estimated by the EPA at USD137billion. This includes USD44–63billion for treatment, USD10billion for sewer repairs and rehabilitation, USD21billion for new sewers and USD45billion to correct combined sewer overflows. In addition to the USD137billion in costs documented by the EPA, individual States estimate an additional USD34billion in wastewater treatment needs for projects that do not meet EPA criteria but, nevertheless, represent a potential demand on State resources.

#### USA, sewerage needs, 2008

USDbillion	2004	%	2008	%
Combined sewer overflows	65.0	25.5%	63.6	21.3%
Sewerage repair and extension	78.6	30.9%	82.6	27.7%
Wastewater treatment works	81.9	32.2%	105.2	35.3%
Stormwater management	25.3	9.9%	42.2	14.2%
Recycled water distribution	5.1	2.0%	4.4	1.5%
<b>Total</b>	<b>254.7</b>		<b>298.1</b>	

#### Overall spending needs

Capital spending needs for drinking water and wastewater for 2003 until 2023 were estimated at USD492–820billion, according to the CBO. These figures mirror those recently drawn up by the US EPA at USD499–929billion. Servicing current and future debt accounts for much of this.

#### Market structure

There are approximately 200,000 water suppliers in the USA. 120,000 of these are point suppliers for institutions such as businesses and schools. There are 60,000 community suppliers, providing water

on a regular basis to at least 15 service connections or 25 people. The American Water Works Association (AWWA) has 56,000 member companies. A great majority of these companies are highly localised in nature. Some 80% of the population is served by 24,000 municipally owned and operated water companies. While there are 6,000 private sector water systems, the great majority of these are local enterprises, having been set up to provide water to a specific locality. There are 374 entities serving 75,000 or more people. Some 95% of private sector contracts have a turnover of less than USD1million pa, equivalent to less than 8,000 people.

### Market structure for water provision

<b>Total number of entities</b>	<b>56,000</b>
Local systems	26,000
Government owned	24,000
Investor owned	6,000
US Market listed	11
Internationally held	4

A major private sector company may act as the ultimate holding company for a large number of individual water companies. American Water Works (RWE), the largest water company in the USA serves 879 separate communities, at an average of 8,500 people per community. 80% of water supply systems are groundwater based, while less than 10% use surface water alone. The larger companies tend to make more use of surface water. According to the EPA, 84% of the systems serving more than 75,000 people use surface water.

### Water provision market structure, 1998–2008

Structure	Size of operation (population served)	Service providers in 1998	Service providers in 2008	Population served (m) in 1998	Population served (m) in 2008
Very Large	>100,000	337	404	111.46	133.13
Large	10,001 - 100,000	3,254	3,728	90.93	106.31
Medium	3,301 - 10,000	4,303	4,838	25.09	28.13
Small	501 - 3,300	14,043	13,858	19.81	19.87
Very Small	<500	32,430	29,160	2.52	4.86
<b>Total</b>	<b>100%</b>	<b>54,367</b>	<b>51,988</b>	<b>252.53</b>	<b>292.30</b>

Source: US EPA (2008) FACTOIDS: Drinking Water and Ground Water Statistics for 2008 & EPA (1998) FACTOIDS: Drinking Water and Ground Water Statistics for 1998

The percentage of costs recovered for drinking water varies by size of the system. In 1995, while only about 60% of the smallest systems recovered their costs, the number of profitable systems rose in the larger size categories (serving over 50,000 customers per system). Revenues for approximately 84% of publicly owned and 94% of privately owned systems covered their operating costs.

<b>Groundwater</b>	
Total recharge (1998, km <sup>3</sup> )	1,514.0
Per capita (1998, m <sup>3</sup> )	5,531
Withdrawals (1990, km <sup>3</sup> )	110.5
For domestic use (1990)	23%
For industry (1990)	6%
For agriculture (1990)	71%

### Opening the market

According to the EPA, in 1995, 34.3million people had their drinking water provided by the private sector. Their total turnover that year was USD14billion. This study has identified 22 private sector companies with a Wall Street market listing providing water and/or sewerage services to a combined total of 33.5million people. In 1998, 95% of sewerage services were in municipal hands, along with 85% of water provision in terms of the population served.

Until 1997, municipal water suppliers had several inbuilt advantages over the private sector. They enjoyed favourable tax differentials, a lower cost of capital, no need to make a profit, no penalty clauses for contract underperformance and no risk management was called for. These advantages were equivalent to a 30% cost advantage when bidding. A municipality can also bury the real costs by shifting administrative staff to other departments. The public sector finds it more challenging to compete for 10-20 year contracts, because of the need to guarantee interest rates for the longer term, while the private sector has tended to avoid seeking five year contracts in recent years.

With an allowable return on investment of 10-12%, the water sector is regarded as offering low political risk, along with slow and steady profits. Pressure to privatise is only really taking place because of new environmental and public health standards at a time of spending constraints and a dislike of higher bills. The Presidential Executive Order 12803 of 1997 was designed to encourage private-public service partnerships, allowing the use of non-recourse taxable and tax exempt debt financing. In addition, if a STW is privatised, previous grants do not have to be repaid in full. Instead, these can be amortised. This process was first used for Cranston, Rhode Island in 1998. At the same time, the IRS announced that it would allow PSP related operating contracts to run for up to 20 years.

### Breakdown of USA water and wastewater services market, 2001

Million people	Water		Sewerage	
Regulated utilities	23.5	8.8%	0.8	0.3%
Municipal outsourcing	18.0	6.5%	21.6	7.8%
Municipal	192.8	69.5%	185.0	63.9%
Privately served	42.0	15.2%	77.4	28.0%
<b>Total</b>	<b>276.2</b>	<b>100.0%</b>	<b>276.2</b>	<b>100.0%</b>

Source: D A LI Owen, company database, US EPA

It is easier to gain a concession for sewerage than for drinking water projects, where contract awards to date have been on an O&M basis. New legislation will be needed to change this. One of the principal constraints is the use of rate of return (ROR) pricing mechanisms. With ROR, excessive investment can be called for to boost overall returns, while contract management costs are boosted by their need to be reviewed every 12-18 months. While the traditional private sector water companies tend to concentrate on water provision contracts, the majority of actual PSPs to take place since 1996 and especially since 1998 have been for sewerage and sewage treatment.

### MAJOR CITIES

Population	2005	2015	Status
New York	18,718,000	19,876,000	Some districts with PPP
Los Angeles	12,298,000	13,095,000	Some districts with PPP
Chicago	8,814,000	9,469,000	BOO for sewage treatment underway
Washington, D.C.	4,238,000	4,613,000	PSP under consideration
Philadelphia	5,392,000	5,806,000	Some districts with PPP
San Francisco	3,385,000	3,666,000	Water construction PPP underway
Dallas	4,665,000	5,121,000	N/A
Detroit	4,034,000	4,342,000	PSP water provision
Houston	4,320,000	4,767,000	Part PPP, United Water Resources
Boston	4,361,000	4,751,000	N/A
San Diego	2,852,000	3,110,000	PSP under consideration
Atlanta	4,304,000	4,864,000	Sewerage management PPP
Phoenix	3,416,000	3,822,000	N/A
Minneapolis	2,556,000	2,795,000	N/A
Miami	5,380,000	6,034,000	Some sewage treatment outsourcing
Seattle	2,989,000	3,289,000	Private water provision contract
Saint Louis	2,159,000	2,346,000	N/A
Tampa	2,252,000	2,481,000	DBO contract for water treatment
Baltimore	2,205,000	2,410,000	N/A
Cleveland	1,855,000	2,019,000	N/A
Pittsburgh	1,806,000	1,962,000	N/A
Riverside – SB	1,690,000	1,882,000	N/A



Population	2005	2015	Status
Denver	2,239,000	2,489,000	N/A
San Jose	1,631,000	1,781,000	N/A
Fort Lauderdale	1,471,000	1,689,000	N/A
Kansas City	1,437,000	1,576,000	N/A
Sacramento	1,550,000	1,731,000	N/A
Portland	1,810,000	2,025,000	N/A
Cincinnati	1,599,000	1,755,000	N/A
San Antonio	1,436,000	1,585,000	N/A
Milwaukee	1,361,000	1,488,000	Private-public partnership for sewage
Norfolk	1,963,000	2,329,000	N/A
Orlando	N/A	N/A	N/A
Virginia Beach	1,460,000	1,598,000	N/A
New Orleans	1,010,000	1,096,000	Sewage treatment PPP
Columbus	1,236,000	1,370,000	N/A
Indianapolis	1,387,000	1,554,000	PSP under consideration
Las Vegas	1,720,000	2,001,000	N/A
Buffalo	999,000	1,091,000	Water management PPP
Providence	1,248,000	1,374,000	N/A
Salt Lake City	943,000	1,042,000	N/A
Oklahoma City	773,000	850,000	Sewage treatment PPP
Memphis	1,053,000	1,167,000	N/A
Jacksonville	961,000	1,069,000	N/A
Louisville	924,000	1,023,000	N/A
Austin	1,107,000	1,271,000	N/A
Charlotte	946,000	1,093,000	N/A
Bridgeport-Stamford	987,000	1,103,000	N/A
Hartford	894,000	984,000	N/A
Nashville	848,000	954,000	N/A
Richmond	888,000	987,000	N/A

As there are two separate markets for PSP in the USA, it is necessary to split corporate activities into those where the assets are owned by the private sector (regulated activities) and those where they remain in municipal hands (O&M). The former has a turnover of USD100-150 per capita against USD35-40 for the latter. The tables below ranks the major players in terms of population served in both classes:

#### Leading regulated utilities (Y/E 31/12/2003, USmillion)

Company	Parent company	Turnover	People served
American Water Works	American Water Works [1]	1,485	10,300,000
United Water Resources	Suez [2]	360	2,150,000
Aqua America	Aqua America	440	3,100,000
California Water Service	California Water Service	320	2,000,000
Southern California Water	American States Water	206	925,000
San Jose Water	SWJ Corp	180	1,000,000
Aquarion	McQuarrie	170	677,000
Elizabethtown Water	AWW	140	650,000
Utilities Inc	AIG	81	905,000
Middlesex Water	Middlesex Water	75	370,000
Southwest Water	Southwest Water	79	462,000
Connecticut Water Service	Connecticut Water Service	47	271,000
Artesian Water Company	Artesian Resources	42	240,000
Pennichuck Water	Pennichuck Corporation	24	130,000
York Water	York Water	27	161,000
<b>Total</b>		<b>3,683</b>	<b>23,379,000</b>

Differing year-end dates:

[1] 12/1002

[2] 12/1999

**Development of O&M and DBO outsourcing contract awards in the USA, 1997-2008**

<b>USD(million)</b>	<b>1997</b>	<b>1999</b>	<b>2001</b>	<b>2003</b>	<b>2005</b>	<b>2007</b>	<b>2008</b>
Municipal O&M	601	802	921	1,050	1,139	1,184	1,206
Industrial O&M	22	314	347	161	153	171	178
<b>Total O&amp;M</b>	<b>623</b>	<b>1,116</b>	<b>1,268</b>	<b>1,211</b>	<b>1,292</b>	<b>1,355</b>	<b>1,384</b>
Municipal DBO	16	178	137	173	217	112	129
Industrial DBO	22	158	44	50	1	5	1
<b>Total DBO</b>	<b>38</b>	<b>336</b>	<b>181</b>	<b>222</b>	<b>218</b>	<b>117</b>	<b>130</b>
Total reported revenue	661	1,452	1,449	1,433	1,509	1,472	1,514
Other companies	99	218	217	215	226	221	227
<b>Total market</b>	<b>670</b>	<b>1,670</b>	<b>1,666</b>	<b>1,648</b>	<b>1,735</b>	<b>1,693</b>	<b>1,741</b>

Source: *Public Works Financing, March 2003 - March 2009*

As there are two separate markets for PSP in the USA, it is necessary to split corporate activities into those where the assets are owned by the private sector (regulated activities) and those where they remain in municipal hands (O&M). The former has a turnover of USD100-150 per capita against USD35-40 for the latter. The tables below ranks the major players in terms of populations served in both classes:

In 1999 there were 13 companies surveyed by PWF, which had fallen to 6 by 2006. In fact, there are 7 major active players (for example AWW could not be surveyed as it was preparing for its IPO). The percentage of such contracts being renewed by the incumbent company rose from 88% to 98% during this period. The fragmented nature of the market is highlighted by an order backlog of USD7,690million for 1,920 reported contracts in 2008. United Water acquired Aquarion Operating Services (2006 revenues USD29million) in 2007, along with Utility Service Co in 2008 (2008 revenues were forecast to be USD120million).

**Leading O&M companies (Y/E 12/2008, USDmillion)**

<b>Company</b>	<b>Parent</b>	<b>Total</b>	<b>O&amp;M</b>	<b>DBO</b>	<b>People served</b>
Veolia Water NA	VE	490	393	97	13,500,000
United Water	Suez	263	263	0	5,250,000
OMI	CH2M Hill	168	163	5	5,000,000
American Water	AWW	155	128	27	4,200,000
Severn Trent Services	Severn Trent	149	149	0	2,715,000
Earth Tech [1]	SE	135	135	0	2,145,000
South West WS	South West Water	110	110	0	2,500,000
Alliance Water [2]	Privately held	20	20	0	230,000
<b>Total</b>		<b>1,297</b>	<b>1,184</b>	<b>112</b>	<b>35,645,000</b>

Source: *Public Works Financing, March 2003, March 2009, company data*

[1] Is for Earth Tech in 2007 (Sold to Suez Environnement during 2008)

[2] Is for 2007

**USA – contract operator and regulated activities in 2009, by people served (million)**

<b>Company</b>	<b>Owner</b>	<b>O&amp;M</b>	<b>Own</b>	<b>Total</b>
American Water Works	AWW	4.20	12.20	16.40
US Filter OS	Veolia Environnement	14.00	0.00	14.00
United Water Resources	Suez Environnement	6.10	1.97	8.07
OMI	CH2M Hill	4.00	0.00	4.00
Severn Trent OS	Severn Trent	3.25	0.00	3.25
Aqua America	Aqua America	0.00	3.00	3.00
Southwest Water	Southwest Water	0.90	0.52	1.42
California Water Service	California Water Service	0.18	2.00	2.18
Utilities Inc	AIG	0.00	1.05	1.05
American States Water	ASW	0.32	0.80	1.12
San Jose Water	SJW Corp	0.00	1.06	1.06
Environmental Mgt. Corp.	Linde	0.82	0.00	0.82
Woodward & Curran	Privately held	0.69	0.00	0.69
Aquarion	McQuarrie	0.00	0.68	0.68
Middlesex Water	Middlesex Water	0.05	0.40	0.45
Connecticut Water Service	Connecticut Water Service	0.00	0.30	0.30
Artesian Water Company	Artesian Water Company	0.00	0.28	0.28
Alliance Water	Privately held	0.34	0.00	0.34
York Water	York Water	0.00	0.18	0.18
Pennichuck Water	Pennichuck Water	0.00	0.14	0.14
Global Water	Global Water Resources	0.00	0.11	0.11
HMMOS	Mott Macdonald	0.05	0.00	0.05
<b>Total</b>		<b>36.00</b>	<b>24.69</b>	<b>60.69</b>

## URUGUAY

<b>Economics (2008)</b>	
GNI per capita	USD8,250
GNI per capita (PPP)	USD12,550
GDP in Agriculture	11%
GDP in Industry	26%
GDP in Services	63%

### Water and sewerage services

Access to safe water in Uruguay is high by South American standards, at 88%, with 45% of water subject to treatment. Although 92% have sanitation, only 48% are linked to the sewers and the on-site sanitation is normally considered inadequate. The quantity and quality of coverage is better in the capital, Montevideo, than in the provincial towns or rural areas. Many residents have restrictions on supply during the summer months. The state owned national utility, Administración de las Obras Sanitarias del Estado (OSE) provides water and sewer services to urban areas excepting Montevideo, where it provides the water service. OSE serves 330 localities with 2.8million inhabitants with water services and 152 localities with 0.5million inhabitants with sewerage services.

In 2009, OSE announced that its non-revenue water rate was 55% unbilled water rate, compared with what it regards as an acceptable 30-35% unbilled water rate.

<b>Population</b>	
Total 2009 (million)	3.4
Total 2020 (million)	3.8
Urbanisation in 2008	92.3%
Urbanisation by 2020	93.5%
Urbanisation by 2050	95.6%

### Sewerage development

The Government's current priority is for the development of a sewerage network and suitable treatment facilities. Currently, 47million m<sup>3</sup> pa of effluents are treated in the city of Montevideo and a further 22million m<sup>3</sup> in other provincial cities. The World Bank has provided USD42million of the USD73million currently being spent on this work. In May 2003, OSE, Uruguay's state water utility, called for tenders for its USD48million modernisation and systems rehabilitation program project. This includes the construction of a water supply main in the city of Salto and the construction of a new wastewater treatment plant for Durazno. The project is partly financed by a USD27million loan from the World Bank.

<b>Urban data (2008)</b>	
With improved drinking water	100%
With household drinking water	98%
With improved sewerage	100%
With household sewerage (2004)	95%
With 2 <sup>o</sup> sewage treatment	5%

<b>Internal freshwater resources</b>	
Annual availability (2007)	59 km <sup>3</sup>
Per capita (2008)	17,696 m <sup>3</sup>
Annual withdrawal (2007)	5.3%
Domestic (2007)	3%
Industrial (2007)	1%
Agriculture (2007)	96%

### A cooling climate

In 2005, Uruguay held a referendum on water policy, where a majority was found in favour of water and sewerage services being the responsibility of the state. This vote applies to new contracts.

In 1997 Aguas de Barcelona acquired 60% of Aguas de la Costa which holds a Punta del Este concession, originally granted in 1993, which carries a 10 year optional extension from 2018. While Agbar sold its stake to the government's OSE in July 2006, its local partners (STA Ingenieros, 30% and Benencio, 10%) are continuing to operate the concession. Aguas de la Costa serves La Barra and San Ignacio.

The Punta del Este area is principally used for upmarket tourism and leisure services. Iberdrola and Consorcio de Aguas de Bilbao Bizkaia gained a USD150million concession serving 40,000 connections in the area in 2000. The concession was revoked in 2005 in the wake of the referendum.

<b>Groundwater</b>	
Annual availability (1998)	23.0km <sup>3</sup>
Per capita	7,101m <sup>3</sup>

OSE invested USD797million on capital projects between 1990 and 2005. Capital spending has declined markedly 2001, typically running at USD5 per capita per annum since then. In 2007, OSE announced plans to increase its annual investment from USD35million pa to USD55-60million pa for the next 4-5 years, via OSE's revenues and through by multilateral banks.

<b>MAJOR CITIES</b>			
City	2005	2015	Comments
Montevideo	1,264,000	1,277,000	N/A

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
Location	Contract	Company
Punta del Este	25 year water and sewerage concession	Aguas de la Costa

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
Aguas de la Costa	STA / Benencio (Uruguay)	100,000	100,000	100,000

## VENEZUELA

<b>Economics (2008)</b>	
GNI per capita	USD9,230
GNI per capita (PPP)	USD12,850
GDP in Agriculture (2005)	4%
GDP in Industry (2005)	58%
GDP in Services (2005)	38%

### A late entrant

Venezuela was opposed to the PSP of its water and utility services long after it had become acceptable across much of Latin America. The country's water services were split into 10 regional entities and Hidrocapital in 1989. Problems in raising finance for capital projects in recent years have led the country to reconsider its position on private sector participation. An initial attempt to introduce PSP in Caracas in 1992 failed due to a lack of interested bidders. In 1996, the government announced that it needed USD1billion to upgrade water and sewerage services across the country, including USD500million for Caracas. Venezuela intended to spend USD533million on water and sewerage service upgrades in 1997, but some of this work had to be scaled back due to economic perturbations. The IADB provided USD102million for water and sewerage upgrading work in 1998. Between 1997 and 2001, a total of USD637million was in fact spent on water and sanitation projects.

International funds from oil reserves are being used to fund USD2billion worth of public projects. The fund will allow the acceleration of some development projects already underway, such as the USD58million El Diluvio dam and the USD100million Metro de Los Teques system in Miranda state.

In 2004, Venezuela announced that it has already met its potable water millennium goal of reducing by half the number of people (based on 1990 figures) who do not have access to potable water, having attained an 88% coverage. According to the government, this goal will be reached for sewerage in 2010. The country aims to have 100% water coverage by 2015, along with 40% of sewage being treated. In total, some USD4.77billion is intended to be invested on various projects between 2003 and 2015.

In 2007, President Hugo Chávez announced that the target for universal water and sewerage coverage was being put forward to 2010. According to Chávez, potable water coverage was 93% in 2007 along with 80% sewerage coverage.

From 2007, the Ley Orgánica para el Servicio de Agua Potable y Saneamiento (the 2001 Organic Law for Services of Fresh Drinking Water and Sanitation) will devolve water and sanitation responsibilities to the municipal level, the services of which will, in theory, be provided by any of a number of agents or partnerships among them: private, public, community or NGO. The process has in fact been delayed, although approximately 20 local cooperatives have come into operation.

<b>Population</b>	
Total 2009 (million)	28.6
Total 2020 (million)	33.5
Urbanisation in 2008	93.3%
Urbanisation by 2020	95.9%
Urbanisation by 2050	97.5%

### Caracas and Hidrocapital

Water and sewerage services for Caracas and the state of Miranda are provided by Hidrocapital. Hidrocapital was corporatised in 1981, and operates a 90km aqueduct serving part of the city of Caracas. The company has 340,000 customers, 64,000 of whom pay their bills, while there are some 200,000 illegal or unregistered connections. In all, some 57% of water provided by Hidrocapital is unaccounted for. Hidrocapital has gained finance for a USD50million upgrade that is to be linked to better billing. In Caracas, 76% of the population receive piped water and the sewerage network covers 53% of the population. Officially, 91% of the country's urban population has access to safe water and 97% have adequate sanitation.

In 2009 Hidrocapital announced that it planned to provide 100% potable water and sewerage coverage by 2012, compared with its current coverage of 95% for potable water coverage and 87% for sewerage.

Updated urban data is unavailable, as none was reported under the JMP process in 2010.

<b>Urban Data (2004)</b>	
With improved drinking water	88%
With household drinking water	75%
With improved sewerage	71%
With household sewerage	61%
With 2 <sup>o</sup> sewage treatment	20%

### **Hidroven**

Outside Caracas, water is managed by the state's Hidroven utility. This entity has a number of affiliate companies. Comphania Hidrologicadel Lago (Hidrolago), for example serves the state of Zulia.

<b>Internal freshwater resources</b>	
Annual availability (2007)	722 km <sup>3</sup>
Per capita (2008)	25,860 m <sup>3</sup>
Annual withdrawal (2007)	1.2%
Domestic (2007)	46%
Industrial (2007)	7%
Agriculture (2007)	47%

### **PSP in Venezuela**

Private sector involvement began in 1997, when FCC of Spain was awarded a four year extendable water provision concession to the city of Monagas (620,000 people). This was not renewed when it expired in 2001. Aguas de Valencia gained a 4 year water management contract for Lara state (population 1,100,000 people) worth USD20million pa in 1999. This contract ended in 2002.

Three PSP contracts have at various times since 2000 been under development. The Caracas water system may be rehabilitated under private sector management. The city had a population of 3.01million in 1995. PSPs are also under consideration for Miranda state's Fajardo water system and Margarita Island's water and sewerage services through the award of a concession contract.

The Chávez administration is distinctly cool towards further private sector involvement, but not necessarily opposed to it.

<b>Groundwater</b>	
Annual availability (2000)	227km <sup>3</sup>
Per capita	9,392m <sup>3</sup>

### **Zulia state**

In 2001 Tecnicas Valencianas del Agua and Colombia's Triple A gained an O&M contract with Hidrolago for the state of Zulia, including Maracaibo, Venezuela's second largest city. A total of 21 municipalities will be served, covering a population of 3.5million people. The contract is worth USD40million pa.

<b>MAJOR CITIES</b>			
City	2005	2015	Comments
Caracas	2,913,000	3,144,000	PSP under consideration
Maracaibo	2,255,000	2,911,000	O&M contract awarded
Valencia	2,451,000	3,499,000	N/A
Maracay	1,168,000	1,463,000	N/A
Barquisimeto	1,029,000	1,243,000	N/A

<b>Private sector contracts awarded</b> (Please see the relevant company entry for details)		
<b>Location</b>	<b>Contract</b>	<b>Company</b>
Zulia State	Water O&M	Tecvasa

<b>Private sector company operations</b> (Please see the relevant company entry for details)				
<b>Company</b>	<b>Parent company (country)</b>	<b>Population served</b>		
		<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Tecvasa	Tecvasa (Spain)	3,500,000	0	3,500,000



## VIETNAM

<b>Economics (2008)</b>	
GNI per capita	USD890
GNI per capita (PPP)	USD2,700
GDP in Agriculture	22%
GDP in Industry	40%
GDP in Services	38%

### Management

The Ministry of Science, Technology and the Environment was created in 1992, with the framework Law on Environmental Protection passed in 1993 and in effect since 1994. The MOSTE's National Environmental Agency was set up in 1994. This resulted in a Country Programme for Clean Water Supply and Environmental Sanitation in 1995. The Ministry of Planning and Investment (created in 1995) has to approve all environment-related projects above a certain size.

Water losses of 45-70% were identified, in the early to mid 1990s. The recent "open door" policy has increased the pace of change by exposing companies to new markets, improved material standards and quality, and the transfer of technology. In 1994, the Ministry of Urban Construction (MUC) with the assistance of the World Bank issued an order to water companies to reduce water loss by 50% by 2005, and issued guidelines on how this should be achieved. The MUC proposed that water entities review losses, identify the loss components and calculate the cost of control, meanwhile eliminating flat rate tariffs so as to encourage water conservation. The main source of water loss is from illegal connections or illegal use, and from consumer meter under-registration. The MUD has in consequence sought to ensure that all consumers are metered along with introducing organisational changes to improve the accountability of the meter readers.

<b>Population</b>	
2007 (million)	88.1
2020 (million)	99.9
Urbanisation in 2007	27.8%
Urbanisation by 2020	34.7%
Urbanisation by 2050	57.0%

### Policies and priorities

73% of urban households in 2004 had access to piped water. In the major cities, 80% of households have access to piped water or private wells. Average urban water consumption is 50-70L per capita per day. 34% of households are either connected to the sewerage system or have septic tanks. Other households either share facilities or use latrines, with 92% having adequate service in 2004.

Vietnam is seeking to spend some USD1billion on reaching 85% safe water coverage by 2010 and 100% coverage by 2020. In March 1999, a decree was passed seeking to have 60-80% of urban sewage and storm waters connected to a sewerage network by 2020, with 90-100% coverage in Hanoi, Ho Chi Minh City and other major cities and industrial zones. The Government expects this to be self-funded through payments from the public and industry. The intention is to create a series of non-profit urban drainage public service corporations. Between 1999 and 2005, the focus was on developing storm sewerage systems for Hanoi and Ho Chi Minh City. Currently state and international investment is running at USD0.6 per capita pa against an estimated need of USD15 per capita pa. These plans are based on uniform tariffs introduced in 1999 with the long term aim of cost recovery, devolving water management to the municipal level and a more positive approach to the private sector as agreed at the 10<sup>th</sup> Party Congress in 2006. In 2004 drinking water distribution was classified as a commercial activity. Particular issues are 21-44% distribution losses in the largest cities, intermittent supplies in some cities and the need to raise investment in water from 0.6% of GDP to 1.2% of GDP for the 2010 plans (ADB, 2007).

<b>Urban Data (2008)</b>	
With improved drinking water	99%
With household drinking water	56%
With improved sewerage	94%

With household sewerage (2004)	14%
With sewage treatment	2%

### Corporatisation: Tra Vinh

The Tra Vinh Water Supply Company (TWSC) is a state-owned enterprise owned by the Tra Vinh Provincial Government. It received AusAID funding to rehabilitate its network in the 1990s. Following its rehabilitation in 1998, the enterprise was corporatised under the 1995 Government Decree No. 14/CP on State Corporations. Despite having had no water tariff increases since 1998, TWSC has been profitable in every year since it was corporatised in 1998. It reported profits of 20% on total revenues in 2003-2004, 15% of which was reinvested in system expansion. The company has also not received any subsidies from the government despite it having a program to assist low-income and ethnic minority households with providing loans without interest for new meters and pipes in new connections. Current plans include the introduction of a rising block tariff system which will penalise high volume users and addressing the 42% water losses from those pipes which were not rehabilitated in the 1990s.

### Private sector involvement

With the exception of Hanoi and Ho Chi Minh City, current projects are mainly aid related. For example, a 10 year bulk water supply project for Hai Phong (population 570,000) has been underway since 1990, involving USD20million of ODA from Finland, along with USD5million from the Vietnamese Government. This project was extended in 1999 with a USD29million project to expand the city's water provision network between 1999 and 2002. The World Bank is also active in Vietnam, having provided a loan of USD32.5million for a USD48.5million project to expand Hanoi's water supplies (currently 100,000m<sup>3</sup> per day) through two new 30,000m<sup>3</sup> per day water treatment works along with allied water distribution systems.

Internal freshwater resources	
Annual availability (2007)	367km <sup>3</sup>
Per capita (2008)	4,251m <sup>3</sup>
Annual withdrawal (2007)	19.5%
Domestic (2007)	8%
Industrial (2007)	24%
Agriculture (2007)	68%

Freshwater	
Annual availability (1998)	376.0km <sup>3</sup>
Per capita	4,827m <sup>3</sup>
Annual withdrawal (1992)	54.3km <sup>3</sup>
Domestic (1987)	4%
Industrial (1987)	10%
Agriculture (1987)	86%

### Local players emerge

In the southern province of Tien Giang, non-state water companies serve about 65% of the 1.6million inhabitants. These include private investors with borrowed capital, cooperatives investing in and managing their own systems, and user groups that have raised capital themselves.

### Investment in piped water schemes in Tien Giang Province, Vietnam

State (& state subsidies)	39%
User groups	34%
Cooperatives	10%
Private investors	17%

In one case, an individual raised USD23,000 to connect 600 households with piped water in 2002-03, charging at the government rate of USD0.25 per m<sup>3</sup>.

<b>Groundwater</b>
--------------------

Annual availability (1998)	84.0km <sup>3</sup>
Per capita	1,078m <sup>3</sup>

### Setbacks for the private sector

In August 2000, the Government announced that no foreign investment would be allowed in Hanoi, while no further foreign BOT contracts would be awarded. Then in 2003, Suez withdrew from its Ho Chi Minh BOT, as part of a corporate retreat from riskier markets. Subsequently, the Asian Development Bank has indicated that it was not happy with Ho Chi Minh City's decision to seek new bids solely from Vietnamese companies for the 300,000m<sup>3</sup> per day Thu Duc water treatment BOT.

In 2008, Manila Water gained a 5 year O&M contract for leakage reduction in part of Saigon's water distribution network. The company aims to develop a series of similar projects in Vietnam.

Private sector contracts awarded (Please see the relevant company entry for details)		
Location	Contract	Company
Ho Chi Minh City	20 year bulk water provision BOT	BAWT
Saigon	5 year leakage reduction O&M	Manila Water

Private sector company operations (Please see the relevant company entry for details)				
Company	Parent company (country)	Population served		
		Water	Sewerage	Total
BAWT	Salcon (Malaysia)	500,000	0	500,000
Manila Water	Manila Water (Philippines)	1,500,000	0	1,500,000

Since 1996, 11% of Ho Chi Minh City's water (100,000m<sup>3</sup> per day) has been provided through a USD38million 20 year BOT project managed by the Binh An Water Treatment Company (BAWT), a Malaysian consortium consisting of Salcon and IJM. The 1998 currency devaluation required a USD25million ADB loan to secure the project.

MAJOR CITIES			
City	2005	2015	Status
Ho Chi Minh City	4,164,000	5,320,000	Bulk water provision part PPP
Hanoi	4,164,000	5,320,000	PSP under consideration
Hai Phong	1,873,000	2,411,000	N/A

### City study: Hanoi

The Hanoi Water Supply Company was set up in 1954 by Hanoi's Department of Transport and Public Works. In 1991, 620,000 people were served by 51,705 household connections, with a further 238,000 being served by public taps at an average ratio of one tap per 170 people. 69% of people within the city area were served with water for an average of 12 hours per day. Leakage was estimated at 53% in 1991 and drinking water was typically boiled before use.

In Hanoi, water loss is increasing (currently 160,000m<sup>3</sup>/day) while the source is being depleted - the groundwater level is dropping by 1.0m/year. By 1994, 32% of total production was billed. The 68% of water unaccounted for comprised 43% typically referred to as distribution losses, 20% identified leakage, and 5% for the water company's own use. The volume of billed water is currently decreasing, despite the repair of 1000 leaks/year and disconnection of 2000 illegal connections each year. It is therefore assumed that the rate of increase of illegal connections is greater than the rate of leak repair. Consumer studies are seen as an immediate requirement to identify or address consumer waste, illegal connections, tariff charges, and consumer contracts. Currently, 50% of Hanoi's 200,000 customers have contracts for revenue payment. The Hanoi water sector was reorganised in early 1994 into a new company the Hanoi Water Business Company, whose business aims are to have 100% of consumers registered, all with meters and at least 85% of water costs recovered through tariff collection, supported by a 24 hour service level.

Sources:

ADB (2007) Country Paper: Vietnam. Asian Water Development Outlook, ADB, Manila

*ADB – APDF (2007) Asian Water Development Outlook 2007: Country Paper – Cambodia, ADB, Manila*

*AusAid (2005) Water Governance in Context: Lessons for Development Assistance, AusAid, Sydney, Australia*

*WSP Field Notes (2004): Private Sector Engagement in Rural Water Supply in the Mekong Region: Tapping the Market*

## **PART 3(i): COMPANY ANALYSIS: MAJOR PLAYERS**

## SAUR (France)/Séché, CDC, and AXA (France)

Société d'Aménagement Urbain et Rural (SAUR) was founded in 1933, making it the last of the major French water companies. Bouygues (see separate entry) acquired SAUR in 1984. SAUR has been associated more with small towns and rural municipalities than either Suez or Veolia Environment (VE). Bouygues sold SAUR (net of its Italian and African activities) to PAI Partners, the French private equity house in January 2005. In March 2007, PAI announced that it is to sell SAUR to Hime, a consortium comprising of Caisse des Dépôts et Consignations (33%), Séché Environnement (33%) and AXA Investment Managers (33%) for EUR1.47billion. In May 2008, CDC granted Séché an 18% option in Hime that if exercised will raise Séché's stake to 51% and may in time pave the way for Séché to take complete ownership of Hime. Séché has a market listing in France and this would in turn allow the company to have a full market presence again.

### Saur/Novasaur/Hime

Y/E (EURmillion)	2005 [1]	2006 [2]	2007	2008	2009
Net sales	309.5	1,436.0	1,472.1	1,536.9	1,500
EBITDA	12.7	152.0	161.8	166.7	N/A
Operating income	2.7	776.0	70.3	69.3	N/A
Pre-tax income	-5.9	N/A	-71.3	-28.9	N/A
Net income	-4.6	N/A	-70.6	-26.7	N/A

[1] 2005: 3 months to 31/03

[2] 2006 and onwards: Y/E 31/12

Including long term technical assistance projects (mainly in Saudi Arabia) SAUR serves 12million people internationally with 699million m<sup>3</sup> per annum of water being provided.

### SAUR water services revenues

SAUR (EURmillion)	2005 [1]	2006 [1]	2007 [1]	2008 [2]	2009 [2]
Saur France	842.3	896.1	935.0	995.0	1,100
Saur International	86.3	94.5	95.0	111.0	- [3]
Stereau	N/A	N/A	103.0	114.0	113
Total	928.6	990.6	1,162.7	1,223.7	1,200
EBITDA	N/A	N/A	126.8	129.8	N/A
Operating income	N/A	N/A	64.1	60.0	N/A

[1] 2005, 2006 & 2007 Y/E is to 31/03

[2] 2008 & 2009 Y/E is to 31/12

[3] Revenues for SAUR France and International

The new entity, including Stereau (water engineering in France and internationally) and Coved (waste management services in France) had a consolidated turnover of EUR1.3billion in 2004. Post the divestment of the Italian and African activities, 93% of SAUR's 2008 revenues came from France (65% Saur, 21% Coved & 7% Stereau), with 78% of the groups revenues being from water.

### SAUR, population served

Country	Water	Sewerage	Total
France	5,500,000	5,500,000	<b>5,500,000</b>
Argentina	1,200,000	950,000	<b>1,200,000</b>
China	3,500,000	0	<b>3,500,000</b>
Armenia	750,000	750,000	<b>750,000</b>
French Overseas Territories	359,000	14,000	<b>359,000</b>
Poland	502,000	550,000	<b>550,000</b>
Scotland	0	600,000	<b>600,000</b>
Spain	720,000	460,000	<b>720,000</b>
<b>Total – Outside France</b>	<b>7,031,000</b>	<b>3,324,000</b>	<b>7,699,000</b>
<b>Global total</b>	<b>12,531,000</b>	<b>8,824,000</b>	<b>13,179,000</b>

## France

In France, SAUR provides water and sewerage services to 5.5million people, serving 6,700 communities with water supply and sewerage services through 5,700 water and sewage treatment contracts via 1,800 water treatment works and 1,500 wastewater treatment works. Cise was acquired in 1997 and served approximately 3.0million people, mainly for water alone and contributed FRF3.2billion in 1996. Customer numbers rose by 1.5% and prices by 1.5% in 2000. In September 2000, Cise was renamed SAUR France. SAUR France was renamed Water Services in France in October 2006. Net water distribution and sanitation sales rose by 4.2% in 2006 to EUR514.9million after a 0.6% reduction in metered consumption. More than 90% of contracts up for award during 2006 and 2007 were retained. Septic tank maintenance is provided to some 1million people in 2,000 communities.

## UK – Scotia Water

1999	Dalmuir, Glasgow	25 year PFI BOT	600,000 sewage treatment
------	------------------	-----------------	--------------------------

Scotia Water (SAUR UK/Stereau (SAUR), Innisfree, Taylor Woodrow, Barr & Halcrow) constructed the replacement of Glasgow West's sewage treatment works which were built in 1904. The new Dalmuir facility offers increased effluent handling capacity and an appreciably higher degree of treatment. Stereau was paid EUR21million for hardware and SAUR receives EUR2.5million pa for the operational life of the contract. A further GBP2.5million in upgrading work was carried out in 2009-10.

## Spain

In October 2007, SAUR sold its 33% stake in Aguas de Valencia (AgVal) to Suez Environment for EUR135million. SAUR's EMALSA and Gestagua provide water services to 720,000 people and sewerage to 460,000 people. EMALSA and Gestagua had a consolidated turnover of EUR46million and EUR30million in 2003 respectively. EMALSA is a JV run between SAUR, Endesa of Spain and the Las Palmas municipality, which provides water via three desalination plants to a total of 400,000 people and sewerage and sewage treatment for 300,000 people. Gestagua provides water to 320,000 people and sewerage and sewage treatment for 159,400 people. In 2007, the Fuengirola concession was extended for a further ten years, serving 50,000 people rising to a seasonal peak of 120,000 people. A 25 year contract serving 12,000 people worth EUR8.25million per annum in Toledo was gained in 2009.

## Gdansk, Poland

SAUR Neptune Gdansk (SNG), a water and sewerage management JV with the municipality of Gdansk and Sopot, started in late 1992 and in its current form runs until 2010. The venture is charging PLN3.95/m<sup>3</sup> (USD0.184) for drinking water and PLN3.45/m<sup>3</sup> (USD0.162) for sewerage services to 470,000 people in the city and 505,000 people overall, via 32,391 water meters in Gdansk and 4,047 in Sopot. The increase in fees has been 36% below the rate of inflation. SAUR holds 50.99% of the company. Water quality has moved from 8% EU compliant in 1992 to 87% by 2000 and 100% compliance for delivered water by 2007, while distribution losses have fallen from approximately 25% in 1992 to 12% in 2007, service compliance rising from 8% in 1992 to 86% in 2002-07. STWs now operate at secondary level and are to be upgraded to tertiary level standard in line with the UWWTD by 2010. The contract generated sales of PLN166million in 2008 and PLN140million in 2006, with a post tax profit of PLN6.3million and PLN4.6million respectively. Between 1999 and 2004, SNG gained ISO 9001, 18001 and 14001 certification, along with overall quality and service certification in 2006.

## Armenia

2004	National	4 year O&M	750,000 water & sewerage
------	----------	------------	--------------------------

This contract for the Armenian Water and Sewerage Company was developed on the lines of the original Yerevan Water contract (see ACEA company entry), the management contract model is now being implemented. In 2004 SAUR was awarded a four year management contract, supported by a World Bank loan. In 2008 a two year extension was granted.

**Argentina**

1998	Mendoza	95 year BOT	1.2million water & sewerage
------	---------	-------------	-----------------------------

SAUR (32%), Enron (32%) and Italgas (4.5%) acquired Obras Sanitarias de Mendoza (OSM) from Mendoza municipality for USD132.7million. Enron sold its stake to South Water SA of Argentina in 2004. Because of the Peso crisis revenues fell from EUR20million in 2002 to EUR18.3million in 2003 and EUR16.6million in 2004. During 1998, the billing collection rate improved from 80% to 90% as the consortium introduced more professional operations management procedures. The province has 1.6million inhabitants with 340,000 water connections serving 1.2million people. The population served by sewerage and sewage treatment has increased from 880,000 in 2001 to 950,000 by 2003. In 2006, the company had 10 water and 10 wastewater treatment works, with a capacity of 5,996 L/sec (518,050m<sup>3</sup>/day) and 3,550 L/sec (302,400m<sup>3</sup>/day) respectively. The contract was renegotiated in 2006.

**West Indies and Reunion Island**

Three contracts for the various French Overseas Territories.

	La Réunion	Martinique	Guadeloupe	Total
<b>Water provision</b>				
Connections	86,726	22,084	10,575	<b>119,385</b>
People served	260,000	68,100	31,100	<b>359,200</b>
<b>Sewage treatment</b>				
People served	13,500	2,618	2,425	<b>14,043</b>
<b>Turnover (EURmillion, 2001)</b>	<b>27.0</b>	<b>8.5</b>	<b>6.9</b>	<b>42.4</b>

**China – Shanghai Fengxian SAUR Water (SFSW)**

2001	Shanghai Fengxian	28 year concession	700,000 water provision
------	-------------------	--------------------	-------------------------

Shanghai Fengxian is a district to the south-west of Shanghai. The plant, operated by SFSW, has a production capacity of 100,000m<sup>3</sup>/day and supplies drinking water to 700,000 people. SFSW is equally owned by SAUR International and a local investment company, and is involved in leakage loss detection across the district's distribution network. Under current conditions, the 28 year contract has aggregate sales of approximately EUR84million and generated sales of EUR7million pa. SAUR sold 50% of its stake in Shanghai Fengxian SAUR Water (SFSW) for EUR5.5million in 2006. These had a book value of EUR5.6million at the time.

1996	Harbin	28 year BOT and O&M	2,800,000 water provision
------	--------	---------------------	---------------------------

This is a 0.225million m<sup>3</sup>/day water treatment plant construction plus management project, which is being operated jointly with the Harbin Water Company. Harbin has a total population of 2.8million. In 1999, Harbin SAUR Water was the first company in the Chinese water sector to be awarded ISO 9000 certification by an international organisation.

**Contact Details**

Name: SAUR  
Address: Atlantis, 1 av Eugene Freyssinet, 78064  
St-Quentin-en-Yvelines Cedex, France  
Tel: +33 1 30 60 22 60  
Web: [www.saur.com](http://www.saur.com)  
[www.osm.com.ar](http://www.osm.com.ar)  
[www.gestagua.es](http://www.gestagua.es)  
[www.sng.com.pl](http://www.sng.com.pl)

Joel Séché (Chairman of Hime, President of SAUR)  
Oliver Brousse (Managing Director, Hime & SAUR)  
Caroline Catoire (Finance Director)



## SUEZ ENVIRONNEMENT SA

Suez Environnement SA is the second largest water and wastewater company in France, but remains the world's leading international player in terms of the number of people served through its water and wastewater operations. The company has gained many of its contracts via contacts made through the water and sewerage engineering design and build projects carried out by its Degrémont subsidiary. Degrémont is currently operating in 40 countries and has worked in 70 countries over the past 30 years. Suez believes that 1 billion people receive drinking water from its treatment plants, including 20% of China's urban population. Since 2003, Suez has eased its expansion strategy. Some contracts have been sold and other handed back, especially in developing economies. Suez is continuing to expand in Europe, North America, India and China. After the merger of Suez and Gas de France (GDF Suez) Suez sold 65% of its water and waste management activities in July 2008, 12% to a group of long term holders and 53% to private and institutional investors.

### Suez Environnement, profit and loss account

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Turnover	11,092.0	11,446.6	12,034.1	12,363.7	12,296.4
EBITDA	1,911.8	1,985.4	2,061.4	2,101.9	2,059.9
Operating income	999.8	1,060.4	1,061.4	1,059.1	926.0
Net income	659.4	573.8	491.7	533.2	403.0
Earnings/share (EUR)	1.35	1.17	1.00	1.09	0.82
Dividends/share (EUR)	N/A	N/A	N/A	0.65	1.30

Société Lyonnaise des Eaux et de l'Éclairage was founded in 1880, making it the third oldest private sector water company in France. Major contract gains at the outset included Cannes (1880), Barcelona (1881), Dunkirk (1902) and Casablanca (1914). La Lyonnaise was traditionally one of the smaller French multi-utility service and construction companies. This is the third time that the company has in essence been a water and waste management entity – Lyonnaise des Eaux (to 1990, then a merger with Dumez), Lyonnaise des Eaux (1993-97, then a merger with Suez) and Suez Environnement (2008 - onwards). The Dumez (France, construction) merger was to ensure that La Lyonnaise was too large for Bouygues to bid for and the merger with Compagnie Financière Suez SA (Belgium, power and waste management) to create a multi-utility at least equal to VE, its traditional rival.

### Suez-Highlights

1880: Société Lyonnaise des Eaux et de l'Éclairage founded  
 1914-46: Activities in Morocco, Tunisia, Togo, Congo & New Caledonia  
 1939: Degrémont founded  
 1947: Electricity activities in France nationalised  
 1958: 300,000 subscribers in France  
 1972: Acquisition of Degrémont  
 1980-90: Enters Spain, UK & USA for water provision  
 1990: Merger with Dumez SA  
 1991: Acquisition of SDI  
 1996: Acquisition of Northumbrian Water Plc for F7.4billion  
 1996: Buys out Eau et Force SA  
 1997: Merger with Compagnie Suez  
 1997: Buys out Degrémont SA  
 1998: Acquisition of Browning Ferris International  
 1999: Acquisition of Nalco and Calgon, buy back of Browning Ferris's stake in SITA  
 2000: Lyonnaise des Eaux organised into three divisions  
 2001: S-LDE renamed Suez, LDE renamed Ondeo  
 2002: Creation of Environmental Division (Ondeo and SITA)  
 2003: Partial divestment of Northumbrian, other contracts handed back, Calgon sold  
 2004: Partial divestment of EMOS, Puerto Rico contract handed back, Nalco sold  
 2005: Rest of Northumbrian sold  
 2006: Contracts closed in Argentina, Brazilian activities sold  
 2007: AISA contract ends in Bolivia, expansion in USA, MENA, India & China  
 2008: Suez Environnement spun off from Suez, acquires Agbar & AgVal stake  
 2009: Chongqing water partnership  
 2010: Unwinding of Suez-Veolia joint contracts in France, full consolidation of Agbar

From 1914 to 1946, Société Lyonnaise des Eaux provided water services in Morocco, Tunisia, Togo, Congo and New Caledonia. These were nationalised in 1946. In 1972 the company sought to re-enter the international market through the acquisition of Degrémont. Contracts and acquisitions were gained in Spain, the UK and USA between 1980 and 1990, along with the acquisition of SDI in France in 1991. By 1993, the company served 40million people (25.5million outside France). Since then, Suez has increased its international activities fourfold, through major contract gains, the 1996 acquisition of Northumbrian Water Plc, the acquisition of Aquas Andinas in Chile and acquisitions in the USA.

In 2008, Suez Environnement (SE) also attained overall ownership of Agbar (see company entry) jointly with Caxia Holding of Spain. This cements a relationship that started in 1991. In 2009, Suez started a bidding process for complete control of Agbar. By June 2010, SE held 91% of Agbar's equity and the market delisting and share buyout programme was underway. This has been enhanced by SE acquiring SAUR's 33% holding in Aguas de Valencia (see company entry in the 2009 Yearbook).

Prior to the merger with Suez, Lyonnaise des Eaux had some 860 subsidiaries, reflecting the complexity of operating a utility via a large number of local contracts built up through contract awards and acquisitions. Compagnie Financiere Suez SA has been of more strategic importance with regard to power (Tractabel & Electrabel) and waste management (Watco) than the water markets. Some small contracts, supplying water to 300,000 people have been integrated into Suez's portfolio of international contracts. The table below outlines Suez's breakdown of the global population served and its main contract gains since 1984.

Year	Million		Contract gains and acquisitions
1984	33	0	France & Spain only
1985	34	1	Macao
1986	34	1	Natal (South Africa, O&M)
1987	34	2	Warsaw (USA)
1988	36	1	Essex & Suffolk Water Plc (UK)
1989	36	2	Montecatini Terme (Italy) & Taiping, (Malaysia)
1990	36	0	There were no contract gains this year
1991	36	4	Fiestole (Italy), Gibraltar & Edmonton (Canada)
1992	37	11	South Africa (O&M), USA, Italy, China & Malaysia
1993	47	10	South Africa (O&M), USA, Argentina, Mexico, Germany & Malaysia
1994	53	11	USA, Czech Republic, Mexico & Hungary
1995	55	9	Czech Republic, Hungary, China, Brazil & Colombia
1996	57	16	USA, Colombia, Northumbrian Water Plc (UK), Germany, Australia
1997	82	17	USA, Bolivia, Colombia, Argentina, Morocco, Hungary, Turkey, China, Indonesia & Philippines
1998	89	16	USA, Colombia, Uruguay, Germany, China, Indonesia & Australia
1999	100	16	USA, Mexico, Chile, Germany, Norway, Slovakia & Italy
2000	108	10+	United Water (USA), Chile, China, Cameroon, Brazil, Germany & Korea
2001	110	5+	Korea, China, Chile, Ireland
2002	131	25+	Taiwan, Canada, China, Mexico, Puerto Rico, Jordan, USA
2003	121	3+	Italy
2004	117	5+	Mexico, Russia, China
2005	115	5+	Australia, Morocco, Algeria
2006	110	4+	Saudi Arabia, China, Oman, Spain & USA
2007	112	7+	China, Aguas de Barcelona (Spain), Egypt, India & USA
2008	117	4+	Aguas de Valencia (Spain), Earth Tech (USA)
2009	117	5+	Aguas de Barcelona (Spain), Earth Tech (China), Melbourne (AUD)

International water and wastewater services accounted for 30% of consolidated water services turnover in 1994 and 1995, rising to 65% by 2001. International activities contributed at least 75% of the water services' net earnings in recent years, but have fallen back since 2001 due to the Peso crisis and the divestment of various activities. In consequence, international activities accounted for 26% of water revenues in 2004. The 2005-12 development plan calls for 'highly selective' expansion outside its core markets, which are identified as Europe, the USA and China.

**2003 to 2007's years of consolidation: activities ceased**

2003	Location	Contract	Population served
Canada	Halifax	Wastewater O&M	380,000
UK	England	Northumbrian Water Plc	6,296,000
USA	Atlanta	Water O&M	2,000,000
Vietnam	Thu Duc	Bulk water BOT	1,000,000
<b>Total</b>			<b>9,676,000</b>

2004	Location	Contract	Population served
Colombia	Bogota	Wastewater BOT	1,500,000
Puerto Rico	Puerto Rico	Water & wastewater O&M	3,900,000
<b>Total</b>			<b>5,400,000</b>

2005	Location	Contract	Population served
Argentina	Santa Fe	Water & wastewater BOT	1,830,000
<b>Total</b>			<b>1,830,000</b>

2006	Location	Contract	Population served
Argentina	Córdoba	Water & wastewater BOT	1,270,000
Argentina	Buenos Aries	Water & wastewater BOT	7,900,000
Brazil	Limeira	Water & wastewater concession	1,656,000
Brazil	Manaus	Water & wastewater concession	1,656,000
Turkey	Antayla	Water O&M	535,000
<b>Total</b>			<b>10,726,000</b>

2007	Location	Contract	Population served
Bolivia	La Paz	Water & wastewater BOT	1,400,000
Philippines	Manila	Water & wastewater BOT	3,800,000
<b>Total</b>			<b>5,200,000</b>

In 2009, contracts serving 273,000 people in Pécs and Kapsovar in Hungary ended. The former expired and the latter has been suspended.

Overall, exit strategies have differed. The Halifax contract was handed back to the municipality and subsequently re-emerged in a different form, while in Puerto Rico and Atlanta the contract was terminated by mutual consent. The Vietnam contract ended after a perceived change in strategy by the Government. Suez sold its holding in Northumbrian Water (NWL) (Ondeo Services UK) in two stages in order to deconsolidate NWL's EUR3.1 billion net debt and sold its activities in Brazil to a local investor. Bogota unilaterally ended the Saltire contract. Suez ended the La Paz/El Alto contract due to local political pressure, with the Buenos Aries and the Aguas de Santa Fe concessions being handed back while the Córdoba concession was sold to a local investor. Despite various problems, the Jakarta and Manila contracts continue to be operated by Suez, although they currently remain under active review.

In Europe, the emphasis is currently on organic growth and gaining contracts in Central and Eastern Europe (where EU subsidies can be mobilised). The three priority markets in Central and Eastern European are the Czech Republic, Hungary and Slovakia.

In September 2003, Suez Ondeo sold Ondeo Nalco to a US based consortium of the Blackstone Group, Apollo Management L.P. and Goldman Sachs Capital Partners for USD4.35 billion. Nalco and Calgon were acquired for USD4,157 million and USD406 million respectively in 1999.

The company's Compass 1 programme aims for organic revenue growth of 5% per annum between 2008 and 2010 and 2% revenue growth through tuck-in acquisitions. EUR4.5 billion has been apportioned for acquisitions, maintenance and development, including EUR600 million for acquisitions in Water Europe and EUR700 million for international acquisitions. Savings of EUR190 million were achieved in 2008-09, compared with planned 2008-10 savings of EUR125 million, later revised to EUR180 million. Compass 2 seeks additional savings of EUR250 million in 2010-12.

**Suez, water and sewage services**

Service	Measure	2006	2007	2008	2009
Water provided	Million m <sup>3</sup> pa	N/A	1,582	1,621	1,581
Sewage/effluent treatment	Million m <sup>3</sup> pa (2 <sup>o</sup> /3 <sup>o</sup> )	N/A	2,603	1,902	1,978
Water coverage	Network Length (km)	N/A	146,626	147,458	147,892
Sewerage coverage	Network Length (km)	N/A	61,060	65,027	67,274
Water facilities	Number of treatment works	N/A	1,614	1,746	1,888
Wastewater facilities	Number of treatment works	N/A	1,554	1,525	1,643
Unaccounted for water	M <sup>3</sup> /km/day	10.7	10.1	9.5	9.7
Wastewater treatment	BOD removal	N/A	88%	90%	87%
Water reuse	Post treatment water	N/A	2%	6%	5%

**Suez Environnement, segmental revenues, EBITDA and operating income**

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
<b>Revenues</b>					
European Water Services	3,646	3,828	3,917	3,865	3,993
European Waste Services	4,570	4,945	5,558	5,770	5,359
International	2,957	2,750	2,645	2,798	2,992
Other	45	37	36	50	58
Intercompany	-127	-113	-122	-120	-119
<b>Total</b>	<b>11,092</b>	<b>11,447</b>	<b>12,034</b>	<b>12,364</b>	<b>12,296</b>
<b>EBITDA</b>					
European Water Services	772	784	810	812	866
European Waste Services	731	844	903	924	798
International	434	402	392	419	468
Other	-25	-45	-43	53	-72
<b>Total</b>	<b>1,912</b>	<b>1,985</b>	<b>2,061</b>	<b>2,102</b>	<b>2,060</b>
<b>Operating income</b>					
European Water Services	534	473	413	415	433
European Waste Services	583	399	459	469	314
International	198	298	270	282	309
Other	-41	-14	-81	-108	-130
<b>Total</b>	<b>1,274</b>	<b>1,155</b>	<b>1,061</b>	<b>1,059</b>	<b>926</b>

Aguas Andinas is consolidated within Agbar and thus is reported in Rest of Europe.

**Suez Environnement, water activity contributions to group turnover**

Y/E 31/12 (EURmillion)	2007	2008	2009
<b>Degrémont</b>	<b>954</b>	<b>1,014</b>	<b>1,053</b>
- Design & Build	63%	62%	60%
- Equipment	15%	16%	18%
- BOT contracts	22%	22%	22%
<b>France</b>	<b>1,900</b>	<b>2,000</b>	<b>2,000</b>
- Drinking water production	49%	50%	51%
- Wastewater collection & treatment	24%	24%	24%
- Other services	15%	14%	14%
- Distribution plant & networks	12%	12%	11%
<b>Agbar</b>	<b>757</b>	<b>915</b>	<b>959</b>
- Spain	62%	69%	69%
- Rest of the world	38%	31%	31%
<b>Germany</b>	<b>49</b>	<b>59</b>	<b>62</b>
<b>Central &amp; Eastern Europe</b>	<b>41</b>	<b>53</b>	<b>52</b>
<b>USA</b>	<b>422</b>	<b>443</b>	<b>547</b>
- Regulated	62%	59%	53%
- Unregulated	38%	41%	47%
<b>China</b>	<b>154</b>	<b>163</b>	<b>187</b>
<b>Indonesia</b>	<b>72</b>	<b>75</b>	<b>73</b>

Y/E 31/12 (EURmillion)	2007	2008	2009
<b>Morocco</b>	<b>461</b>	<b>459</b>	<b>482</b>
- Water	19%	19%	19%
- Wastewater	5%	5%	6%
<b>Ondeo Industrial Services</b>	<b>145</b>	<b>142</b>	<b>137</b>
<b>Safege</b>	<b>72</b>	<b>73</b>	<b>80</b>

### Suez, populations served by country

Country	Water	Sewerage	Total
France	12,300,000	9,000,000	12,300,000
Belgium	300,000	0	300,000
Great Britain [1]	1,066,000	0	1,066,000
Czech Republic	2,165,000	2,165,000	2,165,000
Germany	662,000	749,000	762,000
Hungary	2,400,000	200,000	2,400,000
Ireland	0	220,000	220,000
Italy	50,000	50,000	50,000
Russian Federation	1,000,000	0	1,000,000
Slovakia	150,000	150,000	150,000
Slovenia	0	190,000	190,000
Spain [1]	12,171,598	13,380,000	15,000,000
Chile [1]	6,591,116	6,468,873	6,591,116
Mexico	5,130,000	3,600,000	7,300,000
United States	7,350,000	4,125,000	8,400,000
Australia	3,300,000	75,000	3,360,000
New Zealand	0	160,000	160,000
China & Macao	17,830,000	1,550,000	19,230,000
India	7,000,000	600,000	7,600,000
Indonesia	3,500,000	0	3,500,000
Malaysia	1,565,000	0	1,565,000
South Korea	0	900,000	900,000
Taiwan	3,000,000	0	3,000,000
Jordan	0	2,200,000	2,200,000
Morocco	3,800,000	1,300,000	3,800,000
Algeria	6,500,000	3,500,000	6,500,000
Qatar	0	700,000	700,000
Oman	500,000	0	500,000
Saudi Arabia	6,500,000	3,000,000	6,500,000
South Africa	330,000	0	330,000
Turkey	535,000	535,000	535,000
<b>Total outside France</b>	<b>92,530,714</b>	<b>45,282,873</b>	<b>105,109,116</b>
<b>Global total</b>	<b>104,830,714</b>	<b>54,282,873</b>	<b>117,409,116</b>

[1] Activities carried out by Agbar

### Alliances and JVs

**Ondeo-Lend-Lease Pty:** Australian JV (with an unnamed third partner) formed in 1991. It is a marketing vehicle for gaining the bulk water supply contract for Greater Sydney in 1993. The JV has been extended into South East Asia.

**Sino French Holdings:** A 50/50 JV with Hong Kong's New World Development Corporation, a company that is also actively involved in waste management projects in Hong Kong. SFH is used for all of Suez's contracts in China and Macao.

**Bal-Ondeo:** Suez operates in Mexico through Bal-Ondeo, a 50/50 JV with Peñoles (BAL Group).

**Al Qudra Suez Services:** A JV between the Al Qudra Group of the UAE and Suez signed in 2008.

### Ondeo and poverty reduction

In 2003 Ondeo provided water to 46.5million people in developing economies, including 8.7million people below the poverty line worldwide. This includes 2.5million in South Africa, where they are within 200metres of a standpipe. 7million people have been connected to piped water supplies through service extensions by Suez.

### France

SE's Lyonnaise des Eaux France (LDEF) has been Veolia Environnement's (VE) chief competitor in France (and globally) more or less since 1880. By 1958, Suez had 300,000 subscribers in France. The 1972 acquisition of Degrémont SA saw the company move from straightforward service provision to a more broadly based design, build, operate and transfer contract approach. Suez acquired SDI in 1991, gaining 3% of the French water market or some 1.5million people. By 2001, Suez provided 17million people with water (including some 3million in joint contracts with VE) and 9million with sewerage services, where it has since remained. The sewerage market is growing at an appreciably faster rate than the water market. In 1997, Suez acquired all the outstanding shares in Degrémont SA.

Since the ending of Droit d'entrée in 1995, Suez has not made appreciable progress in gaining new contracts in France. At the same time, with two exceptions, no contracts of material significance have been lost. However, in December 2009, the two Paris water service leases will be terminated. Of the eleven joint contracts with Veolia (Generale des Eaux), eight are now held solely by Suez and three by Veolia.

Recent contract renewals include a 20 year wastewater treatment and recovery contract with Grasse (45,000) worth EUR124million and a 20 year concession for a 200,000 PE carbon-neutral WWTW serving Cannes, which will require EUR77million in investments (EUR57million from LDEF) and generate EUR220million in revenues. Contract gains in 2008 include Nantes (10 years, EUR50million) and Syndicat Intercommunal d'Alimentation en Eau Potable du Bas Languedoc (14 years, EUR68million). Further contract renewals and gains were made in 2009 including a concession-type contract for sewerage and wastewater for Port-Saint-Louis-du Rhone (PE 16,000).

<b>New contracts, 2009</b>	<b>Contract value (EURmillion)</b>	<b>Contract duration (years)</b>
Chateauroux	23	7
Douchy Noyelles Haspres	20	20
Le Harve	19	4
Port-Saint-Louis-du-Rhone	18	20
SIVOM de l'Edioulaz	18	20
Hauts de Bievre	17	12

<b>Retained contracts, 2009</b>		
Rhone Loire Nord	44	12
SIAEP de Montbazens-Rignac	43	12
Biarritz	42	15
Syndicat des Eaux des Monts du Lyonnais	40	12
Libourne (Aquitaine)	23	18
SIVOM Bassin Ehn	18	15
Syndicat URA	18	11
Syseg de Givors	15	9
Syndicat du Puy-en-Velay	13	12
Nice Cote d'Azur	13	6
Syndicat de Salles-Mios	12	12
SI Roannaise de l'Eau	11	8
Tarare	11	12

SE believes that it currently serves 12.3million people in France (20% of the French population) and provides sewerage and wastewater treatment for 9million people (20% of the connected population).

The company manages a total of 2,600 contracts with an average life of 8 years. Between 2002 and 2007, LDEF retained 82% of contracts in terms of contracts and 89% in terms of revenues, which eased to 81% and 87% respectively for 2003-08, with 131 out of 164 contracts due for renewal retained in 2008, along with 30 new contracts. LEDF renewed 81% of contracts by number and 88% by revenues for 2004-09, or 163 out of 210 contracts along with gaining 50 new contracts.

### Spain

Suez's main involvement in Spain is through Agbar (see separate entry). In 2007, Suez, La Caixa, and HISUSA (51% Suez Environment, 49% Caixa Holding), which jointly owned 49.7% of Agbar, launched a public tender offer for Agbar's outstanding shares. As of June 2010, SE held 91% of Agbar's equity and a buyback of other shares was initiated, prior to Agbar's market delisting.

Degrémont is active in developing desalination contracts in Spain and has built or gained orders for 34 plants to date.

2006	Barcelona	30 year concession	1,300,000, desalination
2007	Muxtamel	5 year DBO	200,000, desalination

The former is a EUR159million contract which will provide 200,000m<sup>3</sup> of water/day at a cost of EUR159million, entering service in 2009 and the latter is a EUR55million contract for two towns in Alicante, with an average production of 50,000m<sup>3</sup>/day, rising to 80,000m<sup>3</sup>/day in the tourist season. Degrémont anticipated operating plants desalinating at least 2million m<sup>3</sup>/day of water worldwide by 2009.

In addition, SE acquired a 33% interest in Aguas de Valencia (AgVal) in October 2007. Aguas de Valencia provides water management for 3million people of the Valencia region. SE purchased this minority interest from SAUR for EUR135million. The majority shareholder of AVSA remains Inversiones Financieras AgVal, a Spanish consortium formed by local shareholders, who hold the other 67% of the company. AgVal serves 1million people in Valencia (a 50 year contract renewed in 2001) and has a further 174 water and sewerage contracts in Spain.

### Belgium

Suez's Watco provides water to some 300,000 people in Belgium. Turnover rose from EUR29.6million in 1998 to EUR47.7million in 2000 before falling back to EUR40.5million in 2001.

### Italy

Suez increased its stake in ACEA to 8.6% in October 2005, but as of December 2009, this was 5.1% having eased to 4.9% in 2008. The Aqua Toscane and Arezzo contracts are held by Suez and the others outlined here by ACEA (see separate entry).

1998	Aqua Toscane	30 year concession	50,000 water & sewerage
------	--------------	--------------------	-------------------------

Suez holds 100% of Aqua Toscane, which concentrates on water provision for Fiestole (contract started in 1991), Montecatini Terme (1989) and Ponte Buggianes (1992), Florence in Tuscany.

1999	Arezzo	25 year concession	350,000 water & sewerage
------	--------	--------------------	--------------------------

In January 1999, a Suez-led consortium gained the first international tender award for a water and sewerage concession following the belated liberalisation of the market in the wake of the 1994 Galli law. Suez's consortium holds 46% of Nuove Acque, with 54% being held by public entities. The contract was formally signed in June 1999. The concession has a JV with the 37 communes involved.

2003	Pisa	ATO privatisation	800,000 water & wastewater
------	------	-------------------	----------------------------

A 45% stake in Acque SpA was acquired by the ACEA led consortium for EUR19.2million. Acque is Tuscany's ATO-2, serving 57 communes. The concession will generate EUR1.2billion in revenues.

2003	Siena/Grosetto	ATO privatisation	350,000 water & wastewater
------	----------------	-------------------	----------------------------

A 40% equity stake in the Acquedotto de Fiora was acquired by the ACEA led consortium for EUR19.3million, with a concession life of 25 years. The ATO-6 covers 56 communes and required some EUR433million in capital spending.

2003	Florence	ATO privatisation	1,200,000 water & wastewater
------	----------	-------------------	------------------------------

The ACEA led consortium has acquired 40% of Publiacqua SpA, the holder of the 20 year concession to operate water and wastewater services for 50 communes in Tuscany's ATO-3. Publiacqua had a turnover of EUR104million in 2002 and net profits of EUR8million. The consortium is contributing EUR60million towards the EUR150million capital increase, with the municipalities paying the remaining EUR90million. In conjunction with the privatisation, EUR300million of Publiacqua's revenues were securitised in order to pay for the capital increase and retire mature debt.

With ACEA and Ondeo controlling services for 2.7million out of the 3.5million people living in Tuscany, a rationalisation of these concessions is planned.

### Ireland

2002	Cork	22 year BOT	220,000 wastewater treatment
------	------	-------------	------------------------------

The EUR70million contract is part of a EUR270million drainage and effluent treatment scheme for the city, which is due to be completed in 2004. The STW will have a 270,000m<sup>3</sup> capacity with a PE of 440,000, half being for industrial clients.

### Slovakia

1999	Trencin	20 year lease	150,000 water & wastewater
------	---------	---------------	----------------------------

Suez's TVS was awarded the concession for 50 local authorities in October 1999. The contract requires EUR40million in Capex, including construction of a new sewage treatment works, with EUR5million pa in turnover at the outset. This is the first water services privatisation in the country.

### Slovenia

1997	Maribor	25 year concession	190,000 wastewater treatment
------	---------	--------------------	------------------------------

In February 1997 Suez became the preferred bidder for the Maribor concession. EUR30million investment is needed and the concession project will generate a turnover of EUR8million. There is an EBRD loan attached to the project. The population equivalent for the plant is 200,000 (equivalent to EUR29/capita pa). Maribor is Slovenia's second largest city. Suez is the largest shareholder in the consortium (40% stake, including Degrémont as the constructor). Suez built a water treatment plant in Kopper in 1995. This was the first BOT wastewater treatment contract to be awarded in Central and Eastern Europe.

### Hungary

With the gaining of the Budapest water provision contract, Suez's total water services turnover in Hungary is now in excess of EUR85million pa. The contracts serving Pécs and Káposvár had a total turnover of EUR18million pa. Suez has set up a holding company for all its Hungarian water activities. The Eleseban contract ended in 2009.

1997	Budapest	25 year water distribution	2.2million water
------	----------	----------------------------	------------------

Suez and RWE Aqua control all the shares of the management company and 25% of the equity of the asset management company. The management company formed by Suez (51%) and RWE Aqua (49%) has a 25% stake in Fővarosi Vizmuvek (FV) for USD82million. Suez thus holds 13% of the asset company. FV has a USD65million turnover and employs 2,200 staff. The population currently served is 2.0million.



2006	Budapest	4 years, DBO	1.5million wastewater
------	----------	--------------	-----------------------

In 2006 Degrémont and Veolia, along with Hídépítő and Alterra, two local civil works companies, gained a EUR290million contract to build (EUR249million) and operate for four years (EUR40million) a 350,000m<sup>3</sup>/day wastewater treatment works (wet weather capacity 900,000m<sup>3</sup>) at Csepel to serve 1.5million people in the Budapest area. The facility will enter service in 2010 and will be operated by them until 2014.

1995	Pécs	25 year lease	198,000 water & sewerage
------	------	---------------	--------------------------

Suez holds 48% of Pecszi Vizmu, the operating company, with the municipality holding the remaining 52%. Since 1995, the number of people served has increased from 180,900 to 198,000. Distribution losses have decreased from 35% to 21%. This contract was suspended in 2009.

1995	Káposvár	15 year lease	75,000 water & sewerage
------	----------	---------------	-------------------------

35% of the operating company's equity is held by Suez, with the municipality holding the remaining 65%. The contract has expired and has been returned to municipal operation.

### Czech Republic

1993	Brno (BVK)	25 year concession	420,000 water & sewerage
1994	Ostrava	30 year concession	330,000 water & sewerage
1996	South Moravia	25 year concession	350,000 water & sewerage

Suez holds 46% of BVK, the operating company in Brno. The concession was extended for a 25 year period in October 1999 (starting from 2000). The new concession involves upgrading the wastewater treatment plant to meet the EU's UWWTD criteria.

1994	Karlovy Vary	25 year concession	180,925 water & sewerage
------	--------------	--------------------	--------------------------

Karlovy Vary is based in North Moravia. Suez holds 49.8% of VAK, the operating company's equity. Net profits increased from CZK26million in 2005 to CZK28million in 2006, with 15.205million m<sup>3</sup> of water provided in 2006, although water consumption fell from 101.7 to 99.6L/capita/day between 2005 and 2006.

1999	Ostrava area	15 year concession	0.75million water & sewerage
------	--------------	--------------------	------------------------------

AWG and Suez acquired approximately 76% of the equity of Severomoravske Vodovody a Kanalizace AS (SmVAK) from the municipalities and small shareholders in the region during 1999. Suez currently holds 50.07% of SmVAK. Revenues rose 3.8% to CZK828million in 2006, with a 2% increase in pre-tax profits to CZK62.5million.

2000	Benesov	N/A	38,000 water & sewerage
2000	Davle	N/A	37,000 water & sewerage
2001	Sumperk	Concession	120,000 water & wastewater

82% of Sumperska Provozni Vodohospoda Ska Spole Nost (SPVS) has been acquired by Ondeo Services. SPVS serves 40 towns and districts in the North East with a total turnover of EUR6million pa. Ondeo serves 2.3million people in the Czech Republic and had a 2000 turnover of EUR138million.

### Russian Federation

2004	Moscow	13 year BOOT	1million, water treatment
------	--------	--------------	---------------------------

EVN's WTE awarded the BOOT contract to Degrémont in June 2004. The 275,000m<sup>3</sup>/day plant will provide potable water to South West Moscow from 2007 and be operated by Degrémont and WTE until 2017.

**Germany**

In Germany, Suez operates via Eurawasser. In 2002, Suez bought out Thyssen AG's 51% stake in the JV. Eurawasser had a turnover of EUR75million in 2001 and serves 600,000 people. Revenues in 2009 were EUR62million.

2010	Bad Breisig	Partnership	13,000 water
------	-------------	-------------	--------------

2009	Rheingau	5&3 year partnership	79,000 water & sewerage
------	----------	----------------------	-------------------------

Eurawasser is taking over the operations of Rheingauwasser GmbH (44,000 people) and Abwasserverband Oberer Rheingau (35,000 people).

2004	Cottbus	25 year partnership	147,000 water & sewerage
------	---------	---------------------	--------------------------

Eurawasser acquired 28.9% of Lausitzer Wasser in February 2004. The town of Cottbus retains 50.1% of the company with the balance being held by local municipalities. Water will be supplied to 102,000 people in Cottbus and 45,000 in surrounding areas, along with sewerage services for 117,000 people. Water revenues are EUR12million for water supply and EUR16million for wastewater pa.

1993	Rostock	25 year concession	250,000 water & sewerage
2000	Mecklenburg	25 year concession	61,000 water & wastewater

Rostock was the first major concession awarded to a private sector consortium in Germany. It forms part of the 1991 Baltic Action Plan for reducing effluent discharges into the Baltic Sea. Eurawasser's work on the first phase of the Rostock wastewater treatment facility was completed for EUR85million in 1996 and its treatment capacity increased from 320,000 PE to 400,000 PE in 2002. Total capital spending over the life of the contract will be approximately EUR450million, with EUR300million spent by 2008. 311,000 are served for sewerage and 262,000 for water. The Mecklenburg concession was merged with Rostock in 2003. Wastewater connections for peripheral communities have increased from 28% in 1993 to 86% by 2007 for EUR142million.

2000	Gustrow	25 year BOT	35,000 wastewater
------	---------	-------------	-------------------

The two contracts (Mecklenburg and Gustrow) signed in April 2000 serve a total of 105,000 people in the Mecklenburg-Pomerania region of North East Germany. The Gustrow contract, signed in April 2000, is for the design, construction and management of a wastewater plant to treat 2.4million m<sup>3</sup> pa.

1994	Goslar	25 year concession	55,000 sewerage
------	--------	--------------------	-----------------

Eurawasser has gained a 25 year sewerage contract for Goslar (Lower Saxony) from April 1996. Eurawasser controls a holding of 100% of the management and 49% of assets in terms of equity stakes. The facility will treat 98,000 people equivalents: 55,000 people, 43,000 for industry.

2000	Kriensen	25 year concession	12,000 water & sewerage
------	----------	--------------------	-------------------------

In February 2000, a concession was signed for services to the city of Kriensen.

2001	Schwerin	Participation	100,000 water & sewerage
------	----------	---------------	--------------------------

Suez will participate in up to 49% of the water company following a two year transition period (called a 'silent participation') in the city's multi-utility.

**Great Britain**

Suez sold 72.5% of its 100% stake in Ondeo Services UK in May 2002 (see separate entry for Northumbrian Water). The remaining stake was sold to the Ontario Teacher's Pension Plan for EUR377million in April 2005 for a capital gain of EUR260million. Bristol Water is owned via Agbar.

**Greece**

Suez holds 5.19% of Thessalonica's Eyath (see company entry).

**Morocco**

1997	Casablanca	30 year management	3.8million water & sewerage
------	------------	--------------------	-----------------------------

Lyonnaise des Eaux de Casablanca (LYDEC) manages the Urban Community of Casablanca contract, covering 4.0million people. This represents 25% of the Moroccan market, with a 1,000km<sup>2</sup> area and 23 urban communities covered. Ondeo Services will be responsible for water and sewerage and Elyo for electricity. 14% of LYDEC's equity was sold on the Casablanca Bourse on 18<sup>th</sup> July 2005, 80% of the shares being bought by local investors. Suez Environnement continues to hold 51% of LYDEC with Elyo's 20.75% stake being transferred to SE in 2007 and the remaining 35% being held by Moroccan institutions (see company entry).

The water contract is worth MAD5billion (USD517million) for the expansion and upgrading of water distribution and treatment. Between 1997 and 2007, the number of households connected to the water network rose from 440,000 to 700,000. The wastewater contract is worth MAD16billion (USD1.6billion). By the end of 2006, EUR560million had been invested in the various services. It involves the construction of three WWTWs, including recovery systems and the creation and extension of the sewerage network in development zones of western Casablanca. Currently, 5% of the population is connected to the sewerage network. Leakages of 25million m<sup>3</sup> pa have been dealt with since 1997, equivalent to 5% of water delivered.

2000	Oum Er Rbia	30 year concession	Bulk water provision
------	-------------	--------------------	----------------------

The bulk water supply concession for one third of Casablanca was awarded to Elyo and Ondeo Services. EUR30.5million will be spent on the rehabilitation and upgrading of bulk water supplies delivering 55million m<sup>3</sup> of water to the city, generating EUR305million over the concession's life.

2005	Marrakech	5 year DBO	1million, wastewater treatment
------	-----------	------------	--------------------------------

The DBO calls for a wastewater treatment facility to enter service by the end of 2006. The facility will be funded by an EIB loan and Degrémont will receive EUR9million for its role.

**Algeria**

2005	Taksebt	5 year DBO	2million, water treatment
------	---------	------------	---------------------------

This is a 610,000m<sup>3</sup>/day water treatment facility, operated on behalf of SNC Lavalin. Construction of the facility started in May 2006 and will last for 37 months, and Degrémont will gain EUR38million from the contract.

2005	Athmania	5 year DBO	1million, water treatment
------	----------	------------	---------------------------

This is a 262,500m<sup>3</sup>/day water treatment facility, operated on behalf of Algérienne des Eaux. The facility entered service in 2007 and Degrémont will gain EUR24million from the contract.

2005	Algiers	5 year O&M	3.5million, water & wastewater
------	---------	------------	--------------------------------

The contract is initially worth EUR120million and can be extended into a larger project in 2010. The Algerian authorities are responsible for EUR200million pa in investment alongside the project for upgrading and extending the services of Société des Eaux et d'Assainissement d'Algiers, with 24hrs/day service rising from 16% in 2006 to 71% in 2008 with the aim of 100% coverage by mid 2009. The contract formally started in April 2006.

**Oman**

2006	Oman	Water & power IWPP	500,000 water desalination
------	------	--------------------	----------------------------

Barka 2 is the first private sector water and power facility in Oman. The 120,000 m<sup>3</sup> per day facility contract was gained with Oman's National Trading Company and Mubadala.

### Saudi Arabia

In June 2002, Suez signed a contract with the Kingdom of Saudi Arabia to oversee a EUR10billion 10 year investment programme for the development of water and wastewater in Mecca Province. Mecca Province has 7.5million inhabitants and three major urban areas: the Holy City, Jeddah and Taif. In Jeddah, the second largest city in the country (2.6million people) there is a chronic shortage of water resources and less than 20% of the city is equipped with a sewer system.

2008	Jeddah	7 year O&M	3.0million, water & wastewater
------	--------	------------	--------------------------------

The 7 year USD61million contract started in September 2008, with the aim of bringing 24 hour water delivery, leakage reduction and to reduce sewage network overflows. The contract covers 5,300km of water distribution mains and 1,000km of sewerage networks.

2007	Jubail	23 year BOOT	3.5million, water desalination
------	--------	--------------	--------------------------------

In June 2007, financing was completed for the USD3.44billion required by the independent power and water project. 800,000m<sup>3</sup>/day of water will be desalinated. The Suez led consortium (Suez, GE and Hyundai Heavy Industries) holds 60% of the project equity, with 40% being held by Saudi Government institutions.

### Jordan

2002	Northern Jordan	25 year BOT	2.2million wastewater
------	-----------------	-------------	-----------------------

The contract, announced in July 2002, is designed to bring new water resources into the north of the country. 60% of the USD154million capital spending will come from USAID as a grant. The Khirbet as-Samra treatment facility will replace an existing waste stabilisation pond treatment system, serving about 2.2million residents in Amman and surrounding towns. Construction started in December 2003 with the consortium operating the plant for 22 years after it went into service in August 2008. The facility will handle an average of 267,000m<sup>3</sup>/day of wastewater and the contract will generate revenues of USD15million pa. Up to 100million m<sup>3</sup> pa of treated effluent will be made available for agricultural irrigation. Previously, there has been a management contract for water resources serving 2.5million people in the Greater Amman area which started in 2000 and was handed back to the Government on its completion in December 2006.

### Egypt

2007	Cairo	DBO	1.8million wastewater
------	-------	-----	-----------------------

Degrémont has worked with the 1.5million m<sup>3</sup> per day Gabal El Asfar wastewater treatment plant serving 9million people in Cairo since 2002. In 2007, it was awarded a EUR34million DBO contract to extend the plant by 300,000m<sup>3</sup> per day to serve a further 1.8million people. Degrémont will also continue to serve the original facility from 2008-10 for EUR19.5million. Degrémont has been active in Egypt since 1948 and its water treatment works serve 70% of Cairo's 18million residents.

### Qatar

2006	Lusail	10 year DBO	200,000 wastewater
------	--------	-------------	--------------------

Degrémont, along with Marubeni Corporation (Japan, pumping stations and conveyor/SCT) and Mushrif Trading and Construction Company (Qatar, civil engineering) will build a 60,000 m<sup>3</sup>/day WWTW serving 200,000 people in the city of Lusail under a EUR143million contract. It includes 10km of sewage transfer systems and will cost USD123million to construct and generate USD65million in management fees. The contract was awarded in April 2006 and the facility will enter service during 2007.

2005	Doha	10 year DBO	500,000 wastewater
------	------	-------------	--------------------

A joint venture between Degrémont and Marubeni was awarded a USD180million construction (50/50) and USD80million operation (70/30) contract for the 135,000m<sup>3</sup>/day facility in December 2005, which will enter service in 2008.

**UAE**

In March 2007, Suez signed a strategic partnership with Abu Dhabi's Al Qudra Holdings for bidding for water and waste management projects in the region.

2007	Dubai	10 year DBO	To 900,000 wastewater reuse
------	-------	-------------	-----------------------------

A USD800million DBO contract with Palm Utilities to design, build and operate a sewerage system and 220,000m<sup>3</sup> per day wastewater treatment and reuse facility serving the Jumeriah Golf Estates development in Dubai. This city is currently under development and has a planned population of 900,000. Palm Utilities holds a 30 year water services concession for the city from its developer. Degrémont will hold 54% of the project.

**Cameroon**

2000	SNEC	20 year concession	5.3million water provision
------	------	--------------------	----------------------------

A 51% stake in SNEC (Société National d'Eau du Cameroon) was acquired in May 2000 as part of a concession award. The contract includes the upgrading and rehabilitation of water distribution systems in a number of towns and cities, including Douala and Yaounde, which account for 43% of Cameroon's population. Turnover will be EUR24million pa, with total investments of EUR300million.

**North America**

United Water Resources (UWR) was founded in 1869 and was floated in 1986. In 1994 UWR merged with Suez's General Waterworks Company, giving Suez a 30% holding in UWR. Until it was acquired by Suez, it was the second largest listed water services company in the USA. Suez's USA arm, Lyonnaise American Holdings acquired the remaining 67% of UWR's equity that it did not hold in 2000 and its 50% holding in United Water Services (UWS) for EUR1,108million. After the Earth Tech acquisition in 2008, the company currently serves 7.2million people, 5.1million through its outsourcing activities with 236 contracts in 26 states and 2.0million via 20 regulated utilities in 8 states in the USA. In addition, Utility Service Group was acquired in 2008, which manages and maintains 4,000 water tanks for 2,000 municipalities in 4,000 states.

**Acquisition of Earth Tech's US O&M activities**

As part of the divestiture of Earth Tech's water operations by AECOM, SE acquired 130 O&M contracts generating revenues of USD40million pa in the North East and Mid West regions of the USA. These contracts cover an estimated 1.0million people.

1997	Franklin	20 year DBFO	Water
------	----------	--------------	-------

A 5million gallon per day water treatment plant was constructed by Earth Tech in 1997 at a cost of USD15million. The facility supplies water to the entire city.

2001	Newport	20 year DBO	Wastewater
------	---------	-------------	------------

The contract involves constructing a 10.7million gallon per day wastewater facility for Rhode Island City and will generate USD68.9million in revenues. It is anticipated that the DBO will undercut original cost projections by 25% over its life.

2003	New London	5&5 year O&M	45,000, water & wastewater
------	------------	--------------	----------------------------

The five year O&M contract for the city of New London, CT is worth USD4.4million and carries a five year renewal option. It covers the city's water system (14,000 customers) and wastewater systems (6,000 customers).

**UWR, revenues and assets, 2005-09**

USDmillion	2005	2006	2007	2008	2009
Regulated revenues	313	327	360	385	403
Non-regulated revenues	186	189	218	267	359
Total revenues	400	516	578	652	763
Regulated Asset Base	1,200	1,300	1,400	1,600	1,700

**UWR, regional breakdown of people served by regulated activities in 2010**

Arkansas	55,000
Connecticut	14,000
Delaware	110,000
Delaware – Bethel	7,000
Idaho	240,000
New Jersey	800,000
New Jersey – Hunteerton	4,000
New Jersey – Sussex, Morris and Passaic	8,000
New Jersey – Toms River	125,000
New York	280,000
New York – Owego-Nichols	4,500
New York – New Rochelle	143,000
Pennsylvania	160,000
Rhode Island	19,500
<b>Total utility operations</b>	<b>1,970,000</b>

In February 2007, United Water acquired the Aquarion Water Company of New York for USD28million, serving some 7,500 people with water services and 20,000 with wastewater treatment in three towns in the State of New York. This is now called United Water Westchester. In addition, approximately 200,000 people are served by smaller owned activities in eight other states. New York South County, a regulated water supply company was acquired for USD3million in May 2004.

**UWS, non-regulated activities**

UWS was formed in 1997 through the merger of LDE/UWR and JMM-OSI. UWS has 240 contracts in 26 states and currently serves some 5.1million people via a series of O&M contracts. 2001 turnover was USD174.8million. The Bechtel/United Utilities O&M outsourcing company US Water was acquired for USD40million in 2002. US Water gained its first water and wastewater operating contract in 1982 with the New Jersey Highway Authority. These activities are concentrated in Illinois, North Carolina, Rhode Island and New Jersey. The 1994 wastewater treatment contract with Indianapolis serving 800,000 people was renewed in 2007 with the new contract running from 2008. In June 2007, UW acquired Aquarion Services (AOS), part of Kelda Group's Aquarion. AOS managed Aquarion's water outsourcing activities, covering 650,000 inhabitants in six States (Connecticut, Rhode Island, New Hampshire, Massachusetts, New York and California) through 82 subsidiaries and generating revenues of EUR24million in 2006 compared with USD19million in 2002. AOS's largest contract, a 10 year, USD110million contract to operate the wastewater treatment plant for the Water Pollution Control Authority in Bridgeport, Connecticut was gained in April 2003.

The 1994 Indianapolis contract was renewed for 9 years from 2008 with an option for a further 11 years. The new contract will be worth USD178million. The Jersey City contract was renewed for a further 10 years in 2008 in a contract worth EUR90million. The 227,000m<sup>3</sup> per day Gary sewerage and sewage treatment contract was extended for 5 years in June 2008, generating total revenues of USD54million.

In 2009 UWS gained a five year O&M contract for water reuse for commercial, agricultural and industrial applications in West Basin, California. The USD270million project is the largest water recovery scheme in Southern California.

**UWS, Main Contracts (net of AOS and Earth Tech)**

Location (state)	Contract	Water	Sewerage	Combined
Allamuchy (NJ)	O&M, WTW & WWTW	3,900	3,900	<b>3,900</b>
Atlanta (GA)	20 Year O&M, WTW	1,500,000	0	<b>1,500,000</b>
Avalon (CA)	5 Year O&M, WWTW	0	4,000	<b>4,000</b>
Banning (CA)	5 Year O&M, WWTW	0	25,000	<b>25,000</b>
Bedminster (NJ)	5 Year O&M, WW	0	7,100	<b>7,100</b>
Big Canoe (GA)	5 Year O&M, WTW & WWTW	4,500	4,500	<b>4,500</b>
Boone County (IA)	5 Year O&M, WW collection	0	4,500	<b>4,500</b>
Burbank (CA)	5 Year O&M, WWTW	0	100,000	<b>100,000</b>
Camden (NJ)	20 Year O&M, WTW & WWTW	87,500	87,500	<b>87,500</b>
Cumberland (IA)	5 Year O&M, WWTW	0	6,000	<b>6,000</b>
E Providence (RI)	10 year O&M, , WWTW	0	35,000	<b>35,000</b>
El Segundo (CA)	5 Year O&M, WWTW	0	150	<b>150</b>
Freeport (IL)	5 Year O&M, WTW & WWTW	28,000	28,000	<b>28,000</b>
Gary (IA)	10 + 5 Year O&M, WWTW	0	180,000	<b>180,000</b>
Hoboken (NJ)	20 Year O&M, WTW	33,000	0	<b>33,000</b>
Indianapolis (IA)	13 + 9 Year O&M, WWTW	0	800,000	<b>800,000</b>
Jacksonville (FA)	20 Year O&M, WWTW	N/A	N/A	<b>N/A</b>
Jersey City (NJ)	8 Year O&M, WTW	239,000	0	<b>239,000</b>
Killingly (CT)	5 Year O&M, WWTW	0	2,600	<b>2,600</b>
Laredo (TX)	5 Year O&M, WTW & WWTW	700,000	700,000	<b>700,000</b>
Manalapan (NJ)	20 Year O&M, WTW	1,000	0	<b>1,000</b>
Manchester (NJ)	O&M, WTW	19,100	0	<b>19,100</b>
Milwaukee (WI)	10 Year O&M, WWTW	0	1,200,000	<b>1,200,000</b>
North Adams (MA)	10 Year O&M, WTW	15,500	0	<b>15,500</b>
Pekin (IL)	20 Year O&M, WWTW	0	34,600	<b>34,600</b>
Phillipsburg (NJ)	O&M, WWTW	0	31,450	<b>31,450</b>
Pittsburgh (PA)	O&M, W & WW	350,400	350,400	<b>350,400</b>
Plainfield (IA)	20 Year O&M, WTW	25,000	0	<b>25,000</b>
Rahway (NJ)	20 Year O&M WTW	26,500	26,500	<b>26,500</b>
Reidsville (NC)	O&M, WTW	14,300	0	<b>14,300</b>
San Antonio (TX)	10 Year O&M, WTW	250,000	0	<b>250,000</b>
Springfield (MA)	20 Year O&M, WWTW	0	275,000	<b>275,000</b>
Stonington (CT)	5 Year O&M, WTW	16,000	0	<b>16,000</b>
<b>Total</b>		<b>3,313,700</b>	<b>3,906,200</b>	<b>6,003,600</b>

**Canada**

1998	Banff, Alberta	5 year O&M	7,600 sewage treatment
------	----------------	------------	------------------------

One O&M contract, operated by UWS. The Halifax contract, gained in 2002 was rescinded in 2003. In June 2004, a EUR80million construction contract for Halifax was signed, with the municipality operating three wastewater treatment plants with a total capacity of 640,000m<sup>3</sup> per day which will enter service between 2006 and 2008. Degrémont has been active in Canada since 1960 and has developed more than 500 water facilities there.

**Mexico**

Suez operates in Mexico through Bal-Ondeo, a 50/50 JV with Peñoles (BAL Group). In July 2002, Ondeo acquired Azurix's Mexican operations through the JV for USD93million. The five contracts acquired bring Suez's population served in Mexico to 7.3million along with USD70million pa in revenues.

2004	San Luis Potosi	18 year BOT	400,000, sewage treatment
------	-----------------	-------------	---------------------------

This contract has a total value of EUR263million, with a two year construction and 18 year operational phases. 57% of the 80,000m<sup>3</sup>/day of wastewater will be subject to primary treatment and used as agricultural water. The other 43% will be subjected to tertiary treatment and used for cooling a power station. The contract was awarded to Degrémont, Sumitomo (Japan) and Prodin (Mexico) in June 2004.

1994	Mexico City	10&5 year O&M	2.6million water systems
1999	Mexico City	5&5 year O&M	2.0million water systems

In 1994, IACMEX was awarded a 10 year O&M contract for water metering, billing and collections and water mains maintenance for the central federal district of Mexico City. Azurix acquired a 49% holding in Industrias del Agua de la Ciudad de Mexico (IACMEX) from Severn Trent in 1999. This is for the development of metering and water supply systems, as well as making 330,000 new connections. In October 2004, these contracts were extended for a further five years, and will generate EUR80million in revenues over this period. A further renewal until 2010 was granted in 2009.

1999	Puebla	20 year concession	Sewage treatment
2000	Culiacan	20 year concession	Sewage treatment

Ondeo Degrémont operates six sewage BOTs in Mexico, including the above contracts. The Puebla concession announced in October 1999 is for a sewage treatment works capable of handling 360,000m<sup>3</sup> of effluents each day. The Culiacan facility is situated in Sinaloa state and has a capacity of 150,000m<sup>3</sup>/day. There are two other municipal BOTs serving Juarez and Torreon, and two industrial BOTs based in Santa Cruz and Altamira.

1993	Cancun	30 year concession	520,000 water & sewerage
------	--------	--------------------	--------------------------

The Cancun resort area has a population of 430,000, which had grown to 520,000 by 2002 and is forecast to grow at 3% pa to 2015. There are currently 78,000 connections. 4.3million tourists visit the resort each year. 65% of the concession's revenues currently come from hotels (with USD denominated revenues), with 27% from residential water provision and 8% from wastewater. Azurix acquired its stake in the in Desarrollos Hidraulicos de Cancun (DHC) concession in 1999. The concession generates revenues of USD50million pa and is profitable.

There are also 3 BOT contracts previously operated by Azurix:

1999	León	BOT	1.1million sewage treatment
1999	Torreón	BOT	1.0million sewage handling
1999	Matamoros	BOT	Industrial sewage treatment

## South America

With the exception of its investments in Chile, Suez completed its exit from water and waste management contracts in South America during 2004-07. Aguas de Barcelona, OIS and Degrémont continue to be active in these markets.

### Argentina

Aguas de Santa Fe was meant to be sold to Fides Group and Grupo Energia BV in 2005, but in May 2005, Suez and Agbar decided to terminate the concession. The Aguas Cordobesa concession (Ondeo Services (39%), Agbar (17%) and five Argentinean companies) was sold to its local partners in December 2006. The Aguas Argentinas concession serving Buenos Aires was ended in March 2006.

### Chile

1999	Santiago	Privatisation of EMOS	5.1million water & sewerage
------	----------	-----------------------	-----------------------------

Suez and Agbar acquired 51% of Empresa Metropolitana de Obras Sanitarias (EMOS, now called Aguas Andinas), Santiago's water supply company for a total of USD1,135million in 1999 and 2001. All 44 districts of the city are to be covered, along with the long-term development of its wastewater services. Aguas Andinas generated EUR215million in consolidated revenues for 2003. Revenues are expected to double in the next ten years because of wastewater expansion. Currently, 100% of the population is served with piped water and 97% by mains sewerage, while 75% of sewage effluents are treated. In July 2004, Agbar bought 30.1% of Suez's holding in Inversiones Aguas Metropolitanas Limitada (IAM) for EUR139.4million. Suez and Agbar sold 43.4% of IAM shares on the Santiago Stock Exchange in November 2005 and now holds 14.3% of the company, 7.4% directly by Suez.



2000	NE Santiago	Aguas Cordillera	315,000 water & sewerage
------	-------------	------------------	--------------------------

Enerdis sold Aguas Cordillera to EMOS for USD193million in June 2000. The second highest bidder was Biwater at USD179million. Aguas Cordillera serves 88,000 customers in the Vitacura, Las Condes and Lo Barnechea districts of Santiago.

### Bolivia

Aguas de Illimani, serving La Paz & El Alto was handed to the Bolivian Government in January 2007.

### Brazil

Suez's interests in Brazil were transferred in 2006.

### Colombia

In January 2004, the city of Bogota unilaterally ended the 1997 Saltire WWTW contract, which had served 1,500,000 people.

### China

Suez has a total of 16 major contracts for rehabilitating and expanding current water treatment works. Suez now serves approximately 14.4million people in China via Sino-French Holdings (S-FH), which it operates jointly with New World Development Co. Ltd. of Hong Kong. Ondo and SITA manage EUR866million pa of operations in China in 2009, up from EUR300million in 2000. In addition, Degrémont has completed 132 water and sewage treatment construction contracts in China, having been operating in China since 1975, and is responsible for 20% of China's water and wastewater treatment facilities.

In April 2008, SE and New World announced they were contemplating strengthening their relations with their local partner in Chongqing, through the acquisition of a 15% interest in Chongqing Water Group for EUR140million. SE is already active in the city, which has a population of 32million. CWG operates 32 water treatment plants and 35 wastewater treatment plants in Chongqing by the end of 2007, serving approximately 8.4million residents. CWG aims to provide quality services to the entire Chongqing as well as to expand to surrounding provinces in Western China.

SE and New World acquired Earth Tech's Chinese contracts in 2009 for EUR12million. Agbar also has activities in China which has established in November 2007 a JV with the Chinese company Golden State Water, to supply drinking water and treat wastewater in the province of Jiangsu.

2009	Chongqing	40 year concession, S-FH	1.24million, water
------	-----------	--------------------------	--------------------

Construction of the 200,000m<sup>3</sup> per day EUR42million first phase of the CNY1.5billion 600,000m<sup>3</sup> per day project started in 2009 and will be completed in 2011. The contract was signed in September 2008. This is the first contract to derive from the April 2004 Chongqing Waster Group agreement and extends the company's coverage into the Yuelai district. The entire contract will be worth EUR3billion, with SE's share EUR750million covering 420,000 people at the outset in an area where the population is forecast to rise to 1.24million by 2020. At the same time, a concession contract was signed with CWG for water and wastewater services to the city's Changshou Chemical Industry Park.

2006	Changshu	30 year concession, S-FH	1.5million, water
------	----------	--------------------------	-------------------

SFH will hold 49% of the equity of Changshu Water Supply Co. This covers the treatment and distribution of drinking water through three treatment plants with a total capacity of 675,000m<sup>3</sup>/day, and 2,500km of piping networks. The contract will generate revenues of approximately EUR35million pa through its operational life.

2006	Chongqing	25 year concession, S-FH	1.0million, wastewater treatment
------	-----------	--------------------------	----------------------------------

A 50/50 joint venture contract between S-FH and the Water Company of Chongqing was signed in September 2006 for funding, developing and operating a 300,000m<sup>3</sup>/day wastewater treatment works serving the Jiang Bei and Yubei sectors of the city in Tangjiatuo, building on Suez's water treatment contract signed in 2002 and the agreement drawn up in November 2005 whereby S-FH is investing

EUR60million into a joint venture company for the city. EUR60million will be spent on constructing the facility. In 2007 a further contract was signed, raising the capacity of the facility to 900,000m<sup>3</sup>/day.

2004	Tianjin	35 year O&M, S-FH	0.85million bulk water supply
------	---------	-------------------	-------------------------------

The CNY470million (EUR57million) water treatment plant is to serve part of the city of Tianjin. The Tianjin Tanggu Sino-French Water Supply (S-FH) is a 50/50 joint venture between the city and S-FH. The facility will have a treatment capacity of 310,000m<sup>3</sup>/day.

2002	Chongqing	50 year concession	1,000,000 water
2002	Qingdao	25 year BOT	2,300,000 water

Two WTWs in Chongqing have been refurbished and expanded for a total cost of EUR150million and the two plants can handle 250,000m<sup>3</sup>/day of water. Likewise, two WTWs in Qingdao are to be refurbished and expanded for a total cost of EUR430million. The two plants treat 600,000m<sup>3</sup>/day of water.

2001	Panjin	30 year BOT	267,000 bulk water
2001	Xinchang	30 year BOT	135,000 bulk water
2004	Sanya	30 year O&M	300,000 water

Suez and New World Group, via S-FH, operate three water treatment works in Hainan delivering a total of 230,000m<sup>3</sup>/day of water for EUR36million and managing them on behalf of the city. The system will be 50% held by S-FH and 50% by the municipality's Hainan Tianya Water Industry Holding Co. The Sanya contract started in 2004.

2000	Zhengzhou	30 year BMO, S-FH	Bulk water supply
2000	Baoding	20 year BMO, S-FH	Bulk water supply

The contracts for Zhengzhou (Henan) and Baoding (Hebei) were announced in March 2000. They will serve a total of 1.7million people, with USD62million being spent on capital works for facilities delivering 360,000m<sup>3</sup>/day and 200,000m<sup>3</sup>/day respectively of water and generating a turnover of USD500million over the contracts' life.

1999	Changtu	30 year BMO, S-FH	0.3million bulk water supply
1999	Wanzhou	30 year BMO, S-FH	0.5million bulk water supply
1998	Zongshan	22 year BMO, S-FH	1.7million bulk water supply

The contracts for the provinces of Changtu (Chongqing) and Wanzhou (Liaoning) were formally awarded in April 2000, and involve a total of USD35million in capital spending. These contracts will generate USD400million in turnover during their lives. Zongshan is in Guangdong province. The town and surrounding areas has 1.5million people. The contract has seen the expansion the current capacity of the two extant plants from 0.7million m<sup>3</sup>/day to 0.78million m<sup>3</sup>/day. 66% of the Zongshan contract is held by Sino-French Holdings, with the remainder in municipal hands. Revenues are in the region of EUR15million pa. Degrémont carried out the engineering work and the extended facility entered service in 1999.

1997	Lianjiang	30 year O&M, S-FH	0.3million bulk water supply
------	-----------	-------------------	------------------------------

Lianjiang is in Guangdong Province, with 1.3million inhabitants, 70% of whom are currently served with potable water. The project involves USD15million in Capex for the upgraded potable water treatment plant, which is being built by Degrémont.

1995	Chongqing	30 year BMO, S-FH	0.4million bulk water supply
------	-----------	-------------------	------------------------------

A USD25million build and manage contract in Sichuan province, based upon enlarging a water treatment facility that now supplies 20% of the city's 2million population.

1994	Guangzhou	30 year BMO, S-FH	0.9million bulk water supply
------	-----------	-------------------	------------------------------

The Guangzhou contract will account for 25% of the city's current needs.

1992	Tanzhou	35 year BOT, S-FH	Bulk water supply
1994	Gaozhou	30 year BOT, S-FH	170,000 bulk water supply
1996	Nanchang, Jiangxi	28 year BOT, S-FH	0.9million bulk water supply

The Tanzhou WTW has a current capacity of 150,000m<sup>3</sup>/day.

1985	Macao	25+20 year concession	540,000 water supply
------	-------	-----------------------	----------------------

This is a renewal of the SAAM contract awarded in 1988 for water provision to 540,000 people, including 140,000 customers. Suez/New World Holdings (NWH) holds 85% of the concession. 330,000m<sup>3</sup>/day of water is provided. The contract was renewed for a further 20 years in 2009, with a EUR1billion total contract value.

1999	Changli	30 year 'concession'	150,000 water & sewerage
2001	Guangzhou	20 year DBFO	400,000 sewage treatment
2003	Tianjin	20 year DBFO	3,700,000 water treatment

These contracts were previously operated by Earth Tech. The Changli concession covers engineering, project management, construction, and O&M of the county's water supply system. The JV Company, Qing Huang Dao Pacific Water Company, is responsible for billing customers in Changli. The Changli contract involves developing a water supply, treatment, and distribution system that will produce up to 60,000m<sup>3</sup> per day of water to serve a projected population of 150,000, plus a tourist population of 75,000 during peak periods at a cost of USD10million.

In December 2001, work started on the Xi Lang wastewater treatment plant in Guangzhou. The USD120million 20 year DBFO contract is a JV. The 2 phase project will treat 0.26million m<sup>3</sup> of effluent per day. The first phase will treat 0.13million m<sup>3</sup> of wastewater per day for 400,000 people and serve most of the city's Fang Cun District, the largest and fastest-growing district in Guangzhou. It entered service in 2003 and Earth Tech will manage and operate the system for 18 years. The second phase treats an additional 0.3million m<sup>3</sup> per day of wastewater.

A USD400million, 20 year DBFO project for the Jie Yuan Water Treatment Plant in Tianjin was awarded by the Tianjin Water Works Group Co to Earth Tech Jieuan Water Co Ltd in May 2002. The plant is capable of treating more than 500,000m<sup>3</sup> of water per day and will be comprehensively renovated and upgraded. The remaining 14 years of the contract will generate revenues of EUR77million, with SFH holding 52% of the project company's equity.

## Taiwan

2002	Kaohsiung	17 year BOT	3,000,000 water treatment
------	-----------	-------------	---------------------------

Taiwan Water Supply Corporation awarded a reconstruction and O&M contract to Ondeo Degrémont and Ecotek, a subsidiary of China Steel, for the overhaul and operation of a drinking water plant in Kaohsiung. The contract is worth EUR200million, of which Ondeo Degrémont's share is EUR90million or EUR6million pa over the 15 year O&M stage. The new facility will produce 450,000m<sup>3</sup>/day of drinking water by March 2004.

## Korea

2000	Yangju	24 year BOT	100,000 sewage treatment
------	--------	-------------	--------------------------

Suez and Ondeo Degrémont (60%) and Hanwha (Korea, 40%) became the preferred bidder for a contract to design, build and manage three sewage plants for a total daily volume of 75,000m<sup>3</sup> and an 85km collecting network in the county of Yangju, in the province of Kyonggi. The population currently stands at 100,000 habitants but is predicted to reach 400,000 inhabitants in 2016 due to urban development. Turnover will be of EUR185million over the duration of the contract.

2001	Pusan	18 year BOT	800,000 sewage treatment
------	-------	-------------	--------------------------

The 135,000gal/day facility and 24km of collecting sewerage pipes will cost USD160million to build, with the contract generating USD490million over its lifetime. Ondeo holds 65% of the consortium,

along with Samsung Engineering (20%) and Khumo Industrial (15%). Pusan has a total population of 4million.

### India

Degrémont has been present in India since 1954 and has designed, built and operated 130 drinking water and wastewater treatment plants including water works in Mumbai (11million people), Bangalore (1.5million people) and Delhi (3.5million people). In 2007, a strategic partnership with Mahindra Infrastructure Developers Ltd was signed for developing new projects in India. The 1,900,000m<sup>3</sup> per day Mumbai facility will be augmented by a 990,000m<sup>3</sup> per day EUR59million facility serving 4million people to be built under a 4 year DBO contract signed in January 2008.

2010	Bangalore	2+7 year DBO	3,000,000, water
------	-----------	--------------	------------------

A 600,000m<sup>3</sup> per day plant will be built to augment the city's 400,000m<sup>3</sup> per day facility. The design-build element of the EUR35million project is being supported by Japan's JICA. It will enter service in 2012.

2008	Delhi	10 year DBO	600,000, wastewater treatment
------	-------	-------------	-------------------------------

A 136,500m<sup>3</sup> per day plant will be built in a 30 month period and operated for 10 years by Degrémont in a EUR27million contract. The treated effluent will be used for agricultural irrigation.

2007	Chennai	7 year O&M	4million, water treatment
------	---------	------------	---------------------------

Construction of the 530,000m<sup>3</sup>/day of drinking water treatment plant for the Chennai Metro Water Supply and Sewerage Board started in July 2005 a total cost of EUR25.2million, financed with EUR6.6million from a French State protocol and EUR18.7million from the Tamil Nadu Urban Finance and Infrastructure Development Corporation. This is India's largest water treatment works and the first to be fully operated by Suez. The operating contract runs from 2007-14.

### Philippines

#### Maynilad Water Services (MWSI)

Maynilad Water Services, Inc. (MWSI) was awarded the western half of the Metro Manila (MWSS) water distribution concession in August 1997. On April 29, 2005, MWSI and its bank creditors, along with the MWSS executed a Debt Capital and Restructuring Agreement. As part of this, MWSS acquired 83.97% of the shares of MWSI, with Ondeo holding the remaining shares. In return, the creditors released it from loan obligations worth a total of USD220million. MWSS took over the operations of MWSI in January and sold this to a consortium led by Metro Pacific Investments (see company entry) in 2007.

### Indonesia

1997	West Jakarta	25 year concession	5million water
------	--------------	--------------------	----------------

The number served in West Jakarta has increased from 3.5million to nearly 5million by 2008. The initial investment period was extended from 5 to 10 years in 2000 so as to prevent price rises after a 24% tariff rise in 1999. 50% of residents are currently connected, it is predicted this will rise to 100% by 2022, with 80% paying. Jakarta's population is expected to rise from 9.5million to 12.5million by 2020, with the West Zone population rising to 6.7million. The concession currently treats 615,000m<sup>3</sup>/day of water.

Rate adjustment negotiations resulted in an addendum to the concession agreement on December 24, 2004, providing for an automatic half-yearly rate revision. PT PAM Lyonnaise Jaya was therefore able to obtain an 8.3% rate revision in January 2005 and another 9.5% revision in July 2005. In addition, PT PAM Lyonnaise Jaya's USD denominated debt was refinanced in July 2005 through an INR650billion bond issue of approximately USD67million.

In July 2006, Suez sold 49% of its 100% stake in Pal Jaya retaining a 51% majority. PT Astratel Nusantra of Indonesia now owns 30% of PT PAM Lyonnaise Jaya's equity, with the remaining 19% being held by Citigroup Financial Products Inc.

1997	Medan	25 year BOT	2.5million bulk water
------	-------	-------------	-----------------------

This is a USD85million BOT for a drinking water supply plant for Medan. It is 85% held by Suez. There are currently 2.5million people in the city. The water supply for Phase 1 will be 170,000m<sup>3</sup>/day by 2000, increasing to 260,000m<sup>3</sup>/day. Turnover will be USD2billion over the contract's life, or USD80million pa. Medan's population is expected to grow to 8million+ by 2015 (currently, the city has a population of 2.5million). Suez has operated a water contract in the industrial zone of Cilegon, Java since 1993.

### Malaysia

1993	Johor-Barhu	20 year BOT contract	715,000 water supply
------	-------------	----------------------	----------------------

Johor-Barhu involves the lease of a water provision facility generating 0.63million m<sup>3</sup>/day of potable water. Suez holds 25.5% of the holding company Equiventures Sdn. Bhd., which is expected to seek a market listing in due course.

1995	Kota-Kinabalu	20 year BOT contract	500,000 water supply
------	---------------	----------------------	----------------------

In Kota Kinabalu (province of Sabah) a 20 year bulk supply concession for 0.24million m<sup>3</sup>/day of water to 0.5million people was granted to Jetama Sdn. Bhd. 35% of which was held by Suez in 1995.

1989/95	Taiping, Perak	20 year BOT contract	350,000 water supply
---------	----------------	----------------------	----------------------

In Perak, G.S.L. Water Sdn. Bht. (34.2% Suez) serves 0.35million people via a 20 year BOT contract signed in 1988 and started in 1989. The contract was extended when a 0.11million m<sup>3</sup>/day water treatment plant was commissioned in 1995.

### Australia

1993	Sydney	25 year BOO	3.0million water treatment
1996	Noosa	25 year BOT	45,000 wastewater

Australian Water Services (AWS) is a JV between Suez and Lend Lease Pty formed by Suez in 1991. The Sydney water provision BOT signed in 1993 saw the USD200million facility enter service in October 1996, providing water for 80% of the city. AWS has now entered the 25 year operating concession phase, operating the facility's 3,000MI/day capacity. A BOT concession for Noosa, Queensland was gained in 1996. Water revenues for Suez in Australia in 2004 were EUR30million and water and waste management revenues in 2006 were EUR346million.

2006	Pimpama	25 year DBO	75,000 wastewater
------	---------	-------------	-------------------

Pimpama is a wastewater treatment plant for the town near Brisbane, with a capacity of 17,000m<sup>3</sup>/day.

2005	Perth	25 year DBO	250,000 desalination
------	-------	-------------	----------------------

In April 2004, Perth's Western Australia Water Corporation chose Degrémont and Multiplex Engineering to design, build and operate Perth's first reverse osmosis desalination plant. The 25-year contract for a 140,000m<sup>3</sup>/day facility represents total revenues of over EUR685million for Degrémont, EUR85million in construction work and EUR600million for operating revenues. The facility entered service in April 2007.

2009	Melbourne	27 year DBO	1.2million, desalination
------	-----------	-------------	--------------------------

The AquaSure consortium's facility will serve one third of the city when it enters service in 2011. The EUR2billion contract covers the construction of a 450,000m<sup>3</sup> per day facility with an 85km pipeline network. The operations contract runs for 27 years, generating revenues of EUR1.2billion for Suez. The plant will be designed for a future expansion to 600,000m<sup>3</sup> per day when needed. The facility is to be powered by a wind farm.

### New Zealand

Activities in New Zealand are carried out under New Zealand Water Services, an affiliate of Australian Water Services. Other projects include building the Auckland wastewater treatment plant, serving 1.2million people from 2005.

2002	Hutt Valley	20 year DBO	160,000 wastewater
------	-------------	-------------	--------------------

### Industrial water outsourcing

#### Ondeo Industrial Services

In 2000, Suez had 60,000 water and wastewater customers, mainly for hardware or chemicals, with a 20% share in this global market. Water customers include Yoplait, Pemex Salina Cruz (Mexico), IBM, BSN, Eridania Beghin Say, Coca-Cola (France, 1999) and Scottish Courage (1999).

Ondeo Industrial Services is part of Suez Environment Industrial Solutions (SEIS) for its industrial services activities in Europe. This has been developed along divisional lines: Elyo/Tractabel Industrial Solutions (energy), Ondeo Industrial Solutions (water and wastewater) and Sita One (Waste management). Ondeo Industrial Solutions had a turnover of EUR157million in 2002, rising to EUR168million in 2003 and EUR178million in 2004 and EUR137million in 2009, reflecting the impact of the sale of OIS's German activities, in 2006 for EUR21million. OIS has 200 contracts in Europe and has developed 1,800 process water and 2,000 wastewater treatment plants.

#### Industrial contracts gained in 2001 (EURmillion pa)

Client	Country	Activities	Revenues		Contract duration
			DB	O&M	
Aticorta	Italy	WWTW	2.5	0.0	N/A
Danone Vitapole	Belgium	WWTW	2.0	3.0	10 years
Infineon	Australia	Process water	3.0	0.0	N/A
ISI Pontelongo	Italy	WWTW	2.1	0.0	N/A
Osram	Germany	Process W & WWTW	2.0	0.0	N/A
SEPR Sant Gobain	France	WWTW	1.0	1.5	5 years
Siemens	Taiwan	Process water	1.5	0.0	N/A
Siemens	Ireland	Process water	1.5	0.0	N/A

In 2002, Danone offered a series of five year integrated industrial services outsourcing contracts for all facilities covering dairy products, bottled water, biscuits and cereals. This covers the management of water, effluent waste and energy. The contract will have a turnover of EUR100-150million pa and seeks a 30% reduction in industrial water consumption from 2000 levels by 2010.

A joint venture with Antwerpse Waterwerken (Brabo Industrial Water Solutions, BIWS) gained a EUR10million 10 year contract with Degussa's Antwerp plant in November 2003. BIWS will manage the facility's condensate treatment and supply it with demineralised water. Other contracts gained by Ondeo IS in 2003 included STMicroelectronics and Ascometal in France, Enichem in Italy, Siemens in Spain and M-Real in Germany.

In February 2004, Ondeo gained a 20 year EUR120million water management contract for the BP Grangemouth complex in Scotland. This includes cooling water, process water and wastewater. Other clients in the UK include Chevron Texaco, Scottish Courage Brewing and Bairds Malt. OIS was awarded a EUR16million five year O&M contract with SEAGATE Technologies at Limavidy in Northern Ireland for the hard drive manufacturing facility's water cycle in June 2006.

In June 2005, Elyo gained a EUR143million 12 year contract to supply steam, compressed air and purified water to Goodyear Dunlop Tyres France. 400,000m<sup>3</sup> of water will be provided via reverse osmosis facilities. Elyo gained a EUR90million 13 year contract with SNPE's Bergerac. This includes the provision of raw, filtered and flocculated water. Other contract gains (for water only) by OIS in 2005 included Autofina (EUR26million) and Arcelor Group (EUR10million), both in France.

Suez gained a 20 year private-public partnership contract in May 2007 for water and wastewater treatment for Toulouse-Blagnac Airport. The contract involves EUR10million in Capex and will

incorporate a rainwater recovery and recycling facility designed to handle 700,000m<sup>3</sup> of surface run-off annually.

In 2009, process water treatment management contracts were gained serving Repsol, Ahlstrom, EDF and Galp Energia, along with industrial effluent treatment services for Hellenic Petroleum, Geostock, Scottish & Newcastle, SCA Valdeze and Arkema Lavera.

### China

Suez has specialised in major industrial water contracts in China, serving industrial parks and

2009	Suzhou	30 year wastewater management	Industrial wastewater treatment
------	--------	-------------------------------	---------------------------------

The joint venture contract with CSPU (49% SFH, 51% CSPU) serves the Suzhou Industrial Park and is worth EUR300million.

2002	Pudong, Shanghai	50 year water management	Industrial water provision
------	------------------	--------------------------	----------------------------

This contract is a 50/50 JV between Sino French Holdings and Shanghai Pudong Spark Development Zone United, providing 200,000m<sup>3</sup>/day of industrial water, serving the Shanghai Spark Industrial Zone (40,000 customers). The contract is worth EUR600million and is the first industrial water contract in China. The contract also caters for the treatment of 45,000m<sup>3</sup>/day of effluent via a new EUR50million facility and may be extended to cover the entire water cycle. The Shanghai Chemical Industrial Park includes BP, BASF, Bayer, Huntsman and China's Gao Qiao. In 2002, Ondeo Nalco gained an eight year contract for oil and water treatment service from Suncor Energy, a company specialising in crude oil extraction from oil sands deposits in north-eastern Alberta, Canada. The deal is worth USD10million in revenues.

### Contact Details

Name: Suez Environnement SA  
 Address: 16 Rue de la Ville l'Eveque,  
 75008 Paris, France  
 Tel: +331 40 06 64 00  
 Fax: +331 40 06 66 44  
 Web: [www.suez-environnement.com](http://www.suez-environnement.com)  
 Web: [www.lyonnaise-des-eaux.fr](http://www.lyonnaise-des-eaux.fr)  
 Web: [www.unitedwater.com](http://www.unitedwater.com)

Gerard Mestrallet (Chairman, Suez Environnement & GDF Suez)  
 Jean-Marc Boursier (CFO)  
 Jean-Louis Chaussade (CEO, Suez Environnement)  
 Bernard Guirkingier (Water Europe)

## VEOLIA ENVIRONNEMENT SA

Compagnie Générale des Eaux was renamed Vivendi in May 1998, while retaining its former name for water and wastewater activities. In July 2000, Vivendi Universal sold 28% of its holding in Vivendi Environnement (VE) via a listing on the Paris Bourse and a further 9% in 2001. Vivendi has in turn been renamed Vivendi Universal (VU) and is concentrating upon the telecommunications and media sectors. Following VU's financial problems in 2002, the company sold a further 43% of VE's equity to a series of French institutions and as a result, VE's results (and debt) are no longer consolidated into VU's. VE has been renamed Veolia Environnement (VE) so as to differentiate between the two companies. Water activities were grouped under Veolia Water. After a further sale in December 2004, VU's share of VE fell to 5.3% and was fully divested in 2006. In 2004, after a recapitalisation exercise, the Générale des Eaux name was revived to become the holding company for Veolia Water's French activities.

Veolia Environnement is currently in talks with France's Caisse des Depots et Consignations Group about acquiring its Transdev subsidiary. If this goes ahead, a new transportation company will be formed which would then seek to obtain a market listing.

### Veolia Environnement, profit and loss account

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Turnover	25,570.4	27,941.0	31,574.1	35,764.8	34,551.0
Operating profit	1,892.9	2,124.2	2,461.1	1,960.8	2,020.1
Net profit	622.2	758.7	927.9	405.1	584.1
Earnings/share (EUR)	1.59	1.89	2.13	0.88	1.24
Dividend/share (EUR)	0.85	1.05	1.21	1.21	1.21

### Water

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Operations	6,400	N/A	7,110	7,720	7,899
Works	2,600	N/A	3,818	4,838	4,657
Turnover	9,134*	10,088	10,927	12,558	12,556
Operating profit	1,002*	1,161	1,268	1,196	1,164

\* 2005 include VE's share in Proactiva

Veolia Water has three segments: Veolia Water Operations (municipal and industrial management contracts, 2005 revenues of EUR6.4billion), Veolia Water Solutions & Technologies (design & build contracts and service solutions for municipal and industrial contracts, 2005 revenues of EUR1.6billion, growing to EUR2.5billion in 2009) and Sade (construction, 2005 revenues of EUR1.0billion, 2009 revenues of EUR1.33billion).

Veolia Eau (Veolia Water) served 80.4million people for water and 58.5million for sewerage in 2008 via 4,400 operating contracts globally. In 2009, they estimated they served 95million people with water and 68million for wastewater.

### Veolia Water Solutions & Technologies, breakdown of revenues

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Revenues	1,600	1,900	2,100	2,500	2,500
Municipal clients	60%	57%	61%	65%	61%
Industrial clients	40%	43%	39%	35%	39%
Solutions	41%	34%	38%	31%	29%
Design and build	59%	66%	62%	69%	71%
Europe	61%	66%	50%	43%	40%
Africa & Middle East	17%	11%	27%	37%	38%
Americas	13%	13%	14%	12%	16%
Asia-Pacific	9%	10%	9%	8%	6%

Générale des Eaux (GDE) was founded in 1853 and started the privatisation of France's water sector by winning a concession for water supply to Lyon in that year, subsequently to Nantes (1854), Nice (1864) and gaining the first of a series of concessions serving Paris in 1860. In 1884 GDE secured the



first wastewater treatment concession, serving the Reims municipality and pioneering the use of ozone to sterilise water at Nice in 1909. VE is also a pioneer in the development of the international water market. Its subsidiary Compagnie des Eaux pour l'Etranger (CEE) was set up in 1879 for international water contracts. CEE took over the water supply concession for Venice in 1880 and further contracts were gained in Verona, Bergamo, La Spezia and Naples. The company set up Compagnie des Eaux de Constantinople for water supply to Istanbul in 1879, and in 1882, CEE gained the water supply concession for Lausanne in Switzerland and Oporto in Portugal. After the First World War, VE decided to restrict its contracts to France. As a result, contracts were either wound up or nationalised during the inter-war years.

VE developed its presence in water engineering through the acquisition of SADE in 1918 and Tuyaux Bonna in 1924. Since the 1930s, the French water sector has gradually been privatised with VE being the dominant player in the market. From 1967 onwards, VE has diversified, first into waste management, then energy and more recently into construction, property and media and telecommunications.

VE entered the Spanish water market in competition with FCC and Aguas de Barcelona. Professional Services Group of the USA was acquired in 1981 to address the American market and General Utilities Plc was set up in 1986 in anticipation of the privatisation of Britain's water services. Since 1992, the company has been gaining water and sewerage concessions on a global basis. By 1995, VE had 2,300 operating contracts serving 4,000 municipalities in France. VE reduced the number of subsidiaries in France from 40 to one. The company's domestic market strength has meant that until recently, it could take a more relaxed attitude towards the international water markets than Suez.

#### Approximate breakdown of water revenues by region

EURmillion	2005	2006	2007	2008	2009
France	4,459	4,802	4,927	4,884	4,751
UK	464	552	573	672	640
Germany	1,205	1,283	1,277	1,377	1,372
Rest of Europe	1,111	1,279	1,413	1,680	1,638
<i>Czech Republic</i>	N/A	N/A	N/A	700	N/A
<i>Italy</i>	N/A	N/A	N/A	300	N/A
<i>Benelux</i>	N/A	N/A	N/A	250	N/A
<i>Scandinavia</i>	N/A	N/A	N/A	200	N/A
<i>Spain</i>	N/A	N/A	N/A	120	N/A
<i>Poland</i>	N/A	N/A	N/A	50	N/A
USA	582	641	539	612	691
Rest of Americas	92	122	148	185	N/A
Africa and Middle East	609	705	1,017	N/A	N/A
Middle East	N/A	N/A	N/A	862	858
<i>Sub-Saharan Africa</i>	160	169	189	N/A	N/A
<i>India</i>	0	2	2	N/A	N/A
South East Asia	434	579	733	977	1,162
Australia and New Zealand	101	124	300	359	256
Rest of the World	N/A	N/A	N/A	952	1,189
<b>Total</b>	<b>9,134</b>	<b>10,088</b>	<b>10,927</b>	<b>12,558</b>	<b>12,556</b>

The data used here was derived using the various country and regional breakdowns in the 2008 Reference Document and then reconciling them with the regional breakdowns in the Veolia Eau 2008 Rapport de Activities. This was not possible with the 2009 reports.

2008 European country breakdowns are estimates based in the graphics in the 2008 SD Report.

Rest of the world is India and Sub-Saharan Africa. The 2005,2006 & 2007 breakdowns are from the Veolia Water in AMI Annual Reports (Veolia AMI – Africa, Middle East & India).

Reporting by area was changed in 2007-08. Middle East and Rest of The World revenues were EUR314million and EUR851million respectively in 2007.

**VE – Highlights**

- 1853: Compagnie Générale des Eaux (GDE) wins concession for water supply to Lyons  
 1880-82: Water supply concessions to Venice and other cities  
 1884: Wastewater treatment concession for Reims  
 1967: Waste-to-energy projects  
 1972: Water activities in Spain  
 1980: Acquires CGEA (waste management and transport)  
 1981: Acquires Professional Services Group of the USA  
 1986: General Utilities Plc formed for UK operations  
 1987: Licence for France's second cellular telecoms system  
 1987-88: Acquires construction and property companies  
 1993: Buys out Eau et Ozone  
 1995: GDE's first loss – due to property & construction  
 1998: Générale des Eaux renamed Vivendi  
 1999: Acquires US Filter and Berliner Wasser, formation of Vivendi Water  
 2000: Partial flotation of Vivendi Environnement (VE) from Veolia Universal  
 2002: Deconsolidation of VE and VU  
 2003: VE renamed Veolia Environnement, sale of Everpure  
 2004: Sale of VE's stake in FCC, sale of US Filter & Culligan, VU's holding falls to 5%  
 2005: Acquisition of companies in Italy and Germany  
 2006: VU's last stake sold, Southern Water sold, United Water JV bought  
 2007: Desalination contracts in Saudi Arabia, Oman and Australia  
 2008: Strategic acquisitions in Japan  
 2010: Unwinding the SE / VE contracts in France, acquires UU's European activities

**Water activities (excluding Proactiva)**

<b>VE: overall water and wastewater activities</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Treatment efficiency of wastewater treatment plants	91%	90%	90%	91%	92%
Wastewater treated	N/A	78%	80%	81%	N/A
Industrial provided (million m <sup>3</sup> /pa)	190	369	453	530	542
Customers equipped with a water meter	93%	93%	95%	N/A	N/A
Efficiency of water systems – Worldwide	77%	78%	75%	77%	N/A
Efficiency of water systems – Europe (EU 15)	80%	81%	82%	83%	N/A

Water efficiency in Europe in 2003 for its ongoing activities was 83% in 2003. The difference is accounted for by newly acquired concessions operating more run down water assets. Likewise, worldwide water efficiency in 2007 was 79% net of a new contract serving 1.5million with an efficiency of 15%.

**Population served in each country**

<b>Country</b>	<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
<b>Europe</b>			
France	24,500,000	16,200,000	<b>24,500,000</b>
Armenia	1,200,000	1,000,000	<b>1,000,000</b>
Belgium	0	1,100,000	<b>1,100,000</b>
Bulgaria	1,500,000	1,500,000	<b>1,500,000</b>
Czech Republic	4,288,000	4,148,000	<b>4,288,000</b>
Denmark	83,000	0	<b>83,000</b>
Estonia	405,000	405,000	<b>405,000</b>
Germany	4,950,000	5,030,000	<b>5,050,000</b>
Great Britain	3,317,000	585,000	<b>3,902,000</b>
Ireland	0	120,000	<b>120,000</b>
Hungary	268,000	2,222,000	<b>2,222,000</b>
Italy	1,396,000	2,080,000	<b>2,096,000</b>
Malta	290,000	290,000	<b>290,000</b>
Netherlands	0	1,700,000	<b>1,700,000</b>

Country	Water	Sewerage	Total
<b>Europe</b>			
Poland	380,000	370,000	<b>380,000</b>
Portugal	185,000	275,000	<b>275,000</b>
Romania	2,050,000	0	<b>2,050,000</b>
Slovak Republic	950,000	950,000	<b>950,000</b>
Sweden	50,000	50,000	<b>50,000</b>
<b>Rest of the world</b>			
Argentina *	45,000	45,000	45,000
Canada	127,000	238,000	<b>331,000</b>
Colombia *	2,495,000	287,000	<b>2,495,000</b>
Mexico	5,980,000	3,450,000	<b>5,980,000</b>
Ecqador *	2,100,000	2,100,000	<b>2,100,000</b>
USA	7,000,000	6,000,000	<b>14,000,000</b>
Australia	2,829,000	1,226,000	<b>2,955,000</b>
China	32,150,000	11,660,000	<b>35,300,000</b>
Indonesia	100,000	0	<b>100,000</b>
New Zealand	25,000	251,000	<b>251,000</b>
Philippines	10,000	0	<b>10,000</b>
South Korea	0	410,000	<b>410,000</b>
Gabon	607,000	0	<b>607,000</b>
Israel	1,400,000	0	<b>1,400,000</b>
Morocco	2,900,000	2,200,000	<b>2,900,000</b>
Niger	600,000	0	<b>600,000</b>
Oman	350,000	700,000	<b>1,050,000</b>
Reunion	0	160,000	<b>160,000</b>
UAE	130,000	1,435,000	<b>1,735,000</b>
<b>Total outside France</b>	<b>80,160,000</b>	<b>49,557,000</b>	<b>99,890,000</b>
<b>Global total</b>	<b>104,660,000</b>	<b>65,757,000</b>	<b>124,390,000</b>

\* Proactiva activities

People served via Berlinwasser International have not been included. These can be found in the RWE entry.

The number served in France has remained effectively constant in recent years, net of re-statements for cross shareholdings with Suez Environnement. The table also excludes VE's continuing activities in Spain.

### Stake divestments

Approximately USD390million has been raised since 2001 through the selling off of non-strategic minority stakes in asset owning water companies in England and the USA. In the former case, this is also related to preparing for VE's blocked bid for Southern Water (First Aqua).

Company	Country	Holding %	Date	Value (million)
Bristol Water	UK	25	March 2002	GBP23
Mid Kent	UK	21	April 2001	GBP22
South Staffordshire Group	UK	32	October 2002	GBP85
Philadelphia Suburban	USA	17	September 2002	USD200
Southern Water	UK	25	April 2006	EUR89

In addition, some USD3,193million has been raised from the sale of peripheral activities in the US Filter group since 2001. Purchasers have been a combination of companies active in water systems engineering and private equity houses.

Division	Vendor	Date	USDmillion
Surface Preparation	International Surface Preparation	July 2003	130
Waterworks distribution	JP Morgan/TH Lee Partners	September 2002	620
Plymouth Products	Pentair	September 2002	125
Filtration and Separation	Pall	February 2002	360
Johnson Screens	Weatherford International	October 2001	140
Culligan	Clayton, Dubilier & Rice	June 2004	610
Everpure	Pentair	December 2003	215
Systems & Services	Siemens	May 2004	993

These sales involved a total write-down of USD4.5million between 2000 and 2004. VE's water revenues in the USA will be USD700million pa post these divestments.

### International alliances and JVs

**OMSA:** A JV in Mexico with ICA, serving 7.8million people in the country.

**Proactiva:** Proactiva Medio Ambiente is a 50:50 JV between VE and FCC for all water and waste management contracts in Latin America. Is still being used post the FCC stake sale.

**RWE/Berliner Wasser Betriebe:** A joint bid gained the Budapest sewerage concession in 1997. Since 2000, it has been used on a number of occasions.

**China:** VE has a number of local partners in China. Major contracts have recently been gained with Citic Pacific and Beijing Capital Group.

**EBRD investment:** In 2007, the EBRD (European Bank for Reconstruction and Development) invested EUR90million to acquire 10% of Veolia Voda, which while active in C&EE is primarily VE's vehicle for the Russian Federation and the Ukraine. A 6.88% was acquired by the EBRD in 2009 for EUR70million.

**IFC investment:** In 2007, the International Finance Company (IFC) and France's Société de Promotion et de Participation pour la Coopération Economique (PROPARCO) acquired 19.45% in Veolia Water AMI, the holding company for VE's water activities in Africa, the Middle East and the Indian sub-continent.

**MENA joint venture:** A JV between VE (51%) and Mubadala Development Company (49%) was formed in October 2008 to develop water & wastewater contracts in the MENA region. MDC is owned by the Government of the Emirate of Abu Dhabi and has a series of investments designed to diversity the Emirate's economy.

**Veolia MIG Greece:** A JV between Veolia and Marfin Investment of Greece for investing in projects in Greece and the Balkans was unveiled in December 2009.

### France

Générale des Eaux started operating in France in 1853. By 1953, the company provided water to 8million people and by 1980, it provided water to 19.8million people and sewerage to 6.9million. In 2006, the figure was 24.5million water customers and 16.2million sewerage and sewage treatment customers. The numbers served has fallen from 26million and 17million respectively in 2004 due to joint contracts with Suez being broken up. Numbers served in 2009 were 25million for water and 16million for wastewater. Revenues from these contracts in 2009 were EUR614million. VE has retained the Générale des Eaux name for its operations in France, which currently has 4,000 contracts with 8,000 municipalities in France. The sewerage market is seen as growing at an appreciably faster rate than the water market, because of the low penetration of sewerage networks and sewage treatment in France in the wake of compliance work for the EU's Urban Waste Water Treatment Directive.

In France, the company has to concentrate on consolidating its water contracts in an unprecedented competitive and critical atmosphere. As part of the company's responses to these challenges, customer service charters for 10million people were issued by the end of 1996, with all customers in France being covered by 1999. The unbundling of the 11 contracts jointly held between Veolia and Suez was completed in 2010 and will result in EUR150million in revenues going to Suez and EUR136million going to Veolia.

<b>Générale des Eaux:</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Contract renewal rate	77%	92%	80%	>90%	>90%

New contracts gained in each year have at least cancelled out contract losses in each of these years. For example, 53 contracts were lost in 2003, but 35 new contracts were gained. The average weighted time before the expiration of long term contracts is 12 years. Total revenues for contracts renewed in 2006 are EUR955million, including an 18 year water and wastewater contract for Narbonne (EUR170million), a 12 year water provision contract for Saint Omer (EUR26million) and a wastewater treatment contract gain in Angers Loire (five years, EUR21million). Total revenues for contracts renewed in 2007 were EUR920million, including the community of Nice Côte d'Azur area (12 years, EUR75million), the city of Beauvais (12 years, EUR38million) and the city of Macon (10 years, EUR59million). In 2008, 175 contracts were renewed (86 for water and 89 for wastewater) including a 18 year EUR242million water contract for the Clergy Pontoise area. In 2009, a EUR156million 20 year BOT contract was signed with Chartres Metropole for a 164,000 PE WWTW (extendable to 200,000 PE) incorporating a sludge energy co-generation facility. 223 contracts were renewed in 2009.

The Paris contract ended in December 2009, having generated revenues of EUR143million in that year. The SEDIF contract, serving 4.3million people in the Greater Paris area was renewed for 12 years in 2010 and the new contract will be worth EUR250million pa against EUR360million pa for the previous contract.

<b>New contracts, 2009</b>	Contract value (EURmillion)	Contract duration (years)
Chartres	156	20
Public Authority of Embrunais	62	30
Roquebrune Cap Martin	50	20
Royan	17	10

<b>Retained contracts, 2009</b>	Contract value (EURmillion)	Contract duration (years)
La Roche-sur-Yon	66	12

### Reunion

2010	Reunion North	20 year concession	160,000 sewage treatment
------	---------------	--------------------	--------------------------

The French dependency awarded a concession to Veolia Water, along with OTV, Sogea, SBTPC (Vinci, Italy) and Egis Eau in May 2010. The concession will generate revenues of EUR270million for Veolia Water, EUR75million for the construction of a new WWTW and EUR195million for its operation. The facility will enter service in 2013.

### Denmark

Along with one long standing contract for water provision to 60,000 people via VE's I Krüger AS, VE gained the first wastewater management contract in Denmark in February 2006.

2006	Allerød	8 year management	23,000 sewage treatment
------	---------	-------------------	-------------------------

The contract covers managing three WWTWs, the sewerage system and overhauling the municipality's sludge recycling system for agricultural application.

### The Netherlands

2002	Delftland	30 year DBFO	1,700,000 sewage treatment
------	-----------	--------------	----------------------------

The EUR1.5billion contract was won by the Delfluent Consortium, led by VE (40%); two Dutch publicly owned water distribution companies, Delta Water (20%) and Waterbedrijf Europoort (20%), Rabobank (10%), Heijmans Beton-en Waterbouw (5%) and Strukton (5%). The contract started in 2003 and involves operating the working plant at Houtrust (0.4million PE) and developing the new EUR258million 118million m<sup>3</sup> pa plant at Harnaspolder (1.3million PE) both entering service in March 2007. VE (50%) is leading a JV, along with Delta Water (25%) and Waterbedrijf Europoort

(25%) for operating the facilities and 90 km of sewerage network. Delftland serves The Hague and surrounding areas.

### Spain: FCC

FCC is a Spanish construction and utility company, which dominates the municipal waste collection market. In October 1998, VE acquired 49% of B1998, the holding company for the Koplowitz sisters' interests in FCC, which in turn holds 56.5% of the company. In July 2004, Veolia sold its 49% stake in B1998 to a company controlled by Mrs. Esther Koplowitz. The transaction reduced Veolia Environnement's net indebtedness by EUR1.1billion, with a total cash payment to Veolia Environnement of EUR916million. Veolia Environnement acquired its stake in FCC from Vivendi in 2000 for a total consideration of EUR691million. VE has retained Gruppo General des Aguas (water and sewerage) which in 1997 served 3million people in Spain and had net sales of FRF1billion. The Proactiva joint venture in Latin America is to continue for the time being.

2009	Madrid	4&2 years management	3million, wastewater
------	--------	----------------------	----------------------

This contract is initially worth EUR16million and covers the management of Canal Isabel II's South wastewater treatment plant, which handles 560,000m<sup>3</sup> per day. A sludge digester ensures that the facility is self-sufficient for energy.

2007	Campo Dailas	17 year BOT	water desalination
------	--------------	-------------	--------------------

In May 2007, VE gained a EUR128million (EUR78million to VE) desalination contract in southern Spain, with an 18 month construction and 15 year operation period.

### Portugal

275,000 people (113,000 customers) were served in 2007, generating revenues of EUR29.8million.

1995	Mafra	25 year concession	45,000 water & sewerage
------	-------	--------------------	-------------------------

This is VE's first contract in Portugal. The 25 year water provision concession has sales of FRF25million pa (45,000 people, 22,000 subscribers) and will be extended to wastewater. This award has been seen as somewhat contentious, because it has been alleged that this contract has been set up as a loss leader by VE with its water fee tender of EUR0.46/m<sup>3</sup>, compared with the current price of EUR0.65/m<sup>3</sup> and Agbar's tender of EUR0.48/m<sup>3</sup>. The municipality intends to invest EUR200-250million on improved sewerage systems over the length of the contract.

In 2008, a 15 year wastewater services management contract was agreed with Mafra, worth EUR93million.

1995	Ourem	31 year concession	40,000 sewerage
------	-------	--------------------	-----------------

The concession to serve Ourem (110km north of Lisbon, and 80km from Mafra) was gained in April 1995 (40,000 people, via 15,000 connections), with a turnover of EUR1.8million pa.

1996	Frielas	30 year concession	70,000 PE sewerage
------	---------	--------------------	--------------------

In Frielas, a suburb of north Lisbon, VE is involved in the construction of a wastewater treatment plant. Construction started in March 1996 for a EUR43million facility. This was completed at the end of 1998 and serves the equivalent of 70,000 people through a concession contract.

2000	Valongo	30 year concession	80,000 PE water and wastewater
------	---------	--------------------	--------------------------------

VE was awarded the concession in July 2000 with a turnover of EUR7million pa. Valongo is 20km east of Porto. This contract operates 2 wastewater treatment plants, 200km wastewater collectors and a 480km water network. Aguas de Valongo serves 31,000 subscribers.

2001	Paredes	35 year concession	60,000 PE water & wastewater
------	---------	--------------------	------------------------------

VE was awarded the concession in January 2001 with a turnover of EUR4million for 2002, rising to EUR7million pa. Paredes is 40km east of Porto. This contract operates one wastewater treatment plant, 80km wastewater collectors and a 100km water network. SBPAR serves 5,000 subscribers.

### Veolia Water in northern Central Europe (2007 figures)

Country	Revenues (EURm)	People - Water	People - Sewerage
Poland	6	3,400,000	4,000,000
Czech Republic	470	60,000	70,000
Slovene Republic	141	2,000,000	270,000
Slovak Republic	58	600,500	1,000,000
<b>Total</b>	<b>676</b>	<b>6,060,000</b>	<b>5,340,000</b>

### The Czech Republic

Veolia Voda ([www.veoliavoda.cz](http://www.veoliavoda.cz)) serves 4.3million people in 1,200 municipalities, along with 15 industrial water outsourcing contracts. Revenues in 2005 were CZK 11billion. In 2002, VE acquired Bouygues' 50% holding in their CTSE JV. 1.JVS was sold to Energie AG (Austria) in 2008, which served 220,000 people.

2006	Prostejov	25 year management	70,000 water & sewerage
------	-----------	--------------------	-------------------------

VE will manage the Prostejov Water Company's facilities in the Moravian Region and the contract will generate EUR139million.

2006	Slany	15 year management	21,000 water & sewerage
------	-------	--------------------	-------------------------

This contract is adjacent to the Kladno-Melnik contract area. Total revenues will be EUR30million.

2005	Hradec Karlove	30 year concession	149,000 water & sewerage
------	----------------	--------------------	--------------------------

The contract covers 100,000 people in Hradec Kralove, Eastern Bohemia's regional capital and 50,000 in 100 other municipalities in the region. The contract will generate revenues of EUR525million. Kralovehradecka Provozni AS had revenues of CZK534million in 2006.

2004	Kladno-Melnik	20 year concession	331,000 water & sewerage
------	---------------	--------------------	--------------------------

Revenues for the contract will be worth EUR600million. Stredoceske Vodárny AS generated revenues of CZK614million in 2006.

2004	Eastern Moravia	30 year concession	157,000 water & sewerage
------	-----------------	--------------------	--------------------------

In June 2004 Veolia signed a 30 year contract with Vodovbody a Kanalizace Zlin (VAK Zlin) the water public authority for the eastern part of Moravia in the Czech Republic. The area includes 80 districts. The contract will generate total revenues of around EUR360million. Revenues in 2006 were CZK374million.

1999	V Klatovy	10 year concession	50,000 water & sewerage
------	-----------	--------------------	-------------------------

1996	Pilsen	12 + 10 year concession	230,000 water & sewerage
1996	Sokolov	10 + 16 year concession	130,000 water & sewerage
1999	Aqua Pibram	10 + 10 year concession	80,600 water & sewerage

Vodarenska and Kanalizanci AS Plzen (VP) serves the city of Pilsen on a lease with O&M work. The contract is currently for water provision (230,000 people) plus wastewater (180,000 people), the latter through a new sewage treatment facility opened in 1997. Industrial and domestic customers pay an equal amount for water and prices are below that seen in most of the Czech Republic. During 1997, the contract was extended to cover a further 72,000 people in the northern part of Pilsen. Allied with the sewerage expansion, this boosted 1998 turnover to CZK700million which was steady at CZK737million in 2006. In 2000, the Pilsen contract was granted a 10 year extension to 2017. In 2004, VP extended its service areas in the two latter districts with the municipalities of Štenovice, Cizcice and Ejpovice.

The Aqua Pibram concession was gained in December 1999. Aqua Pibran was renamed 1.ScV AS after the merger with VAK Ricany u Prahy, s.r.o., which added 4,600 people. 1.ScV had revenues of CZK274million in 2006, while the Sokolov contract gained a 16 year extension. The Aqua Pibram concession contract was extended by 10 years in 2003, with revenues of EUR4million pa.

1998	Northern Bohemia	15 year concession (1995)	1,238,000 water & sewerage
------	------------------	---------------------------	----------------------------

Hyder's stake was sold for CZK795million (USD26.7million) to VE, giving the company 43.17% of Severomoravske Vodovy a Kanalizace Ostrava (ScVK), with Severoceske Vodarensky Svaz (SVS), formed by the client towns, holding a further 34.7%. At the start, 1.07million of the inhabitants were connected to the mains water supply and 0.87million to the sewerage network. ScVK's turnover to March 1999 was CZK1.1billion and rose to CZK5.53billion in 2006.

2000	Olomouc	20 year concession	140,000 water
------	---------	--------------------	---------------

This concession was awarded to Stredomoravska Vodarenska AS (SMV) in March 2000. It is the first PSP contract in the region. Total net sales for the contract will be EUR200million. 2006 revenues were CZK395million.

2001	Prague	28 year concession	1,465,000 water & wastewater
------	--------	--------------------	------------------------------

VE and AWG paid EUR174million for a 66% stake in PVK, and VE subsequently bought out AWG's stake. In 2002, the remaining 34% of shares were acquired from the municipality. The 13 year concession will generate EUR60million in 2001 and EUR120million in subsequent years. The contract will concentrate on service quality improvement and upgrading water and sewage treatment to EU standards. The concession was extended to 28 years in 2002. Leakage was reduced from 47% in 2001 to 23% by 2006. Revenues in 2006 were CZK4.6billion.

### Slovakia

These contracts, awarded in May 2006, are the first international water tenders in the Slovak Republic. Water and wastewater services will be provided to 950,000 people in 750 towns, villages and districts in Central and Northern Slovakia.

2006	Banska Bystrica	30 year concession	660,000 water & wastewater
------	-----------------	--------------------	----------------------------

This is a concession with the Banska Bystrica Water Company (StVS) which will generate revenues of EUR1.4billion over the contract. The town of Banska Bystrica has 85,000 people, with 660,000 in the region.

2006	Poprad	30 year concession	290,000 water & wastewater
------	--------	--------------------	----------------------------

Poprad Water Company (PVS) was awarded the concession, with annual revenues of EUR17million and a total contract value of EUR566million. There are 57,000 people in the town of Poprad, which is part of the Presov region in the North East of the country.

### Hungary

VE aims to increase its share of the market in Hungary from 20% to 50% in the medium term. In 2007, it served a total of 2.3million people.

2006	Erd Region	25 year concession	100,000 water & sewerage
------	------------	--------------------	--------------------------

Érd és Térsége Víziközmű Kft, a joint venture with the Budapest Water Company was set up in May 2006 for providing water and wastewater services to 100,000 people in the seven districts of Erd which lies to the south of Budapest. VE and Budapest Water will hold 26% of the operating company with the municipalities retaining 74%.

2004	Salgótarján	20 year O&M	44,000 sewerage
------	-------------	-------------	-----------------

The Salgótarjáni Csatornamű Kft contract covers the operation of a sewage treatment works and sewerage system serving the towns of Salgótarján, Kazár, Mátraszele and Vizslás.



1994	Szeged	15 year concession	168,000 water & sewerage
------	--------	--------------------	--------------------------

The Szeged contract had a HUF1.16billion turnover (HUF40million) in 1995. The 15 year contract was awarded to VE's 100% held subsidiary Servitec, which holds 49% of Szegedi Vizmü, the holding company for the contract. Currently 60% of the city is connected to the sewerage network. The contract was gained after VE had been awarded a HUF200million water treatment plant construction contract in 1992. The company has been profitable since 1996 and water consumption has been reduced by targeting leakage, installing meters and a progressive pricing policy.

2006	Budapest	4 years, DBO	1.5million wastewater
------	----------	--------------	-----------------------

In 2006 Degrémont and Veolia, along with Hídépítő and Alterra, two local civil works companies, gained a EUR290million contract to build (EUR249million) and operate for four years (EUR40million) a 350,000m<sup>3</sup>/day wastewater treatment works (wet weather capacity 900,000m<sup>3</sup>) at Csepel to serve 1.5million people in the Budapest area. The facility will enter service in 2010 and will be operated by them until 2014.

1997	Budapest	25 year concession	1.9million, sewerage
------	----------	--------------------	----------------------

The management company formed by VE (35%), BWI (35%) and EBRD (30%) took a 25.1% stake in Fővárosi Csatornászási Művek Rt., Budapest's wastewater company. Secondary treatment capacity has increased from 220,000m<sup>3</sup>/day in 2000 to 280,000m<sup>3</sup>/day in 2004 (76% being used), with the number of customer connections rising from 137,813 to 162,753.

### Poland

2006	Wozniky	10 year management	10,000 water
------	---------	--------------------	--------------

VE's PWIK Wozniky gained the contract for the town of Wozniky in Upper Silesia in February 2006.

2001	TGMS	25 year concession	70,000 water & sewerage
------	------	--------------------	-------------------------

The contract to operate the Tarnowskie Gory and Miasteczko Slaskie water company was gained in December 2001. The company manages the municipal water and wastewater services for 70,000 people in the two towns. VE's initial 33.85% stake increased to 63.5% in 2003. The contract will generate total revenues of EUR125million.

### Romania

2000	Ploiesti	25 year concession	250,000 water
------	----------	--------------------	---------------

The concession was awarded to Apa Nova Plotesti SRL (73% held by VE, 27% by the municipality) in April 2000. EUR26million will be spent on network upgrading and renewal over 15 years and EUR47million on treatment systems over 25 years, with a turnover of EUR8million pa.

2000	Bucharest	25 year concession	1.8million water and wastewater
------	-----------	--------------------	---------------------------------

The concession to modernise Bucharest's water supply was granted to Apa Nova Bucuresti ANB (84% held by VE, 16% by the municipality) in April 2000. EUR210million was invested in the first nine years of the concession out of an expected total of EUR1.05billion, with the proportion of households receiving a continual water supply rising from 39% to 91%. Annual revenues will be EUR80million pa. At the start of the contract, 1.8million people were served with water and 1.67million with wastewater. By 2009, this had increased 2.3million.

### Acquisition of United Utilities' C&EE activities

VE acquired UU's C&EE contract portfolio in April 2010, with contracts in Poland and Bulgaria and a stake in Tallinna Vesi of Estonia.

### Poland

1999	Biesko Biala	12 year concession	300,000 water and wastewater
------	--------------	--------------------	------------------------------

In November 1999, UUI and International Water entered into a strategic partnership with the municipality of Biesko Biala and acquired 33.2% of Aqua SA, the utility providing water and wastewater services to the city (200,000) and 12 municipalities in the surrounding area. The concession is being supported by the World Bank.

### Estonia

2000	Tallinn	15 year concession	405,000 water and wastewater
------	---------	--------------------	------------------------------

The total contract is worth USD700million. UU and IW bid EEK, 338million (USD75.6million) for a 50.4% stake in AS Tallinna Vesi. The city of Tallinn also holds a single Golden Share. The IPO of Tallinna Vesi saw UU's stake fall from 38% to 26.5%. There were 15% price increases in 2004 and 2005. The emphasis is on developing a municipal and stormwater sewerage and effluent treatment system. Tallinna Vesi has 19,300 customer connections including apartment blocks where all people are served through a common metered connection. 62% of customers are domestic customers, 26% apartment associations and 12% are commercial customers.

Service extension continues, with 1,300 households in Tallinn were connected in 2008 and a further 1,500 in 2009. Water coverage in 2008 was 99% and sewerage coverage 98%.

Wastewater plant efficiency rose from 57.1% to 78.9% between 2002 and 2006, distribution losses fell from 32% in 2002 to 17% in 2009 (the corporate aim is 15-18%) and water quality compliance (all samples) rose from 95.1% in 2002 to 98.0% in 2008. After a rate rise of 6.5% above inflation in January 2008, there are 2% above RPI increases for 2009 and 2010 and rates will rise with inflation thereafter to 2020.

### Tallinna Vesi AS, profit and loss account

FY 31/12 (EEKmillion)	2005	2006	2007	2008	2009
Water – Private	N/A	N/A	178.5	193.7	211.4
Wastewater – Private	N/A	N/A	140.5	153.1	167.9
Water - Commercial	N/A	N/A	138.7	150.7	152.1
Wastewater – Commercial	N/A	N/A	114.0	120.6	121.2
Water - Outside	N/A	N/A	1.5	2.2	7.8
Wastewater – Outside	N/A	N/A	16.1	24.2	32.2
Total revenues	592.0	693.2	648.4	719.9	772.4
Net Income	174.4	277.8	227.8	296.0	339.9

In August 2008, the company signed a 30 year O&M contract with the city of Maardu (16,500). Services were also extended to Harku and Saue (9,000 in total). Tallinna Vesi aims to gain similar contracts with other municipalities near to its system and aims to serve 20,000 more people by 2010.

For further details, please see the separate company entry for Tallinna Vesi in the 2009 Yearbook.

### Bulgaria

1999	Sofia	25 year concession	1,500,000 water and wastewater
------	-------	--------------------	--------------------------------

UUI and International Water were awarded the concession in December 1999. The winning bid was based on fees of USD152million against USD239-273million tendered by Suez and Berlin Water and USD66million in Capex in the first three years, against USD59-64million by the same companies. USD200million will be invested in the city's infrastructure over the life of the concession. The contract is worth GBP700million over its life. UU holds 57.8% of Sofiyska Voda. Customer satisfaction has increased from 23% in 2000 to 70% by 2005.

### The Russian Federation

In 2007, the EBRD (European Bank for Reconstruction and Development) invested EUR90million to acquire 10% of Veolia Voda, which is active in C&EE and the Russian Federation and the Ukraine. A further EUR70million was invested in 2009, bringing the EBRD's stake up to 16.88%.

2005	St Petersburg	5 year management	2million water
------	---------------	-------------------	----------------

Veolia Water's SPEP (Société Eau Pure, 51% GDE, 48% Vodokanal & 1% St Petersburg municipality) gained a five year management contract for the city's left bank water treatment works. This facility handles 1.2million m<sup>3</sup>/day of water.

A partnership with Evraziysky and Eurasian Water Partnership for the development of water and wastewater projects in Russia was signed in October 2006, including acquiring 50% of EWP's equity. EWP currently has water and wastewater contracts serving Rostov-on-Don (Voda Rostova) and Omsk.

### Armenia

2005	Yerevan	10 year management	1.2million water & wastewater
------	---------	--------------------	-------------------------------

A EUR160million contract supported by World Bank funding. The initial emphasis will be in managing water leakage and service extension.

### United Kingdom

Veolia Water UK has controlling holdings in three British Statutory Water Companies (SWCs), asset owning entities that supply water only. VE acquired six SWCs between 1988 and 1990, the most important of which is Three Valleys Water. VE sold its final interest in Southern Water to Southern Water Capital Limited in April 2006 for EUR89.6million.

Y/E 31/03/2010 (£million)	Population	Equity Holding	Turnover	Operating Profit
Veolia Water Central	3,000,000	100.0%	234.37	42.58
Veolia Water East	154,000	99.1%	15.15	5.45
Veolia Water Southeast	163,220	78.7%	18.82	5.98

The SWCs were renamed in 2009:

Veolia Water Central	Three Valleys
Veolia Water Southeast	Tendring Hundreds
Veolia water East	Folkestone & Dover

Three Valleys Water consists of the Colne Valley, Rickmansworth and Lee Valley Water companies, which were merged in 1994. The company grew again following a merger in October 2000 with VE's North Surrey Water, which was formed in 1973 from four founder companies. The company provides 0.858million m<sup>3</sup>/day of water to parts of Bedfordshire, Berkshire, Buckinghamshire, Essex, Hertfordshire, Surrey, and the London Boroughs of Barnet, Brent, Ealing, Harrow, Hillingdon and Enfield. TVW reached a 37% level of metering by 2010.

Tendring Hundreds and Folkestone and Dover are characterised by high levels of domestic metering. 66% of the former company's domestic customers had meters in 2007, while the latter company aims to have 90% of customers metered by 2015 compared with 55% in 2007. The Folkestone Waterworks Company was formed in 1848, one of the first to take advantage of the Waterway Clauses Act of 1847, and merged with two other companies in 1953 and 1970.

Thames Water Services was acquired by Veolia Water UK for EUR115million (GBP78million) in August 2007, with an enterprise value of EUR233million. UK revenues of EUR160million (GBP109million) are anticipated for 2008 (with EUR80million revenues gained in the first half of 2008). The company has two principal contracts in Wales and Scotland.

### Scotland

1998/99	Eastern Scotland	30 year PFI BOT	585,000 sewage treatment
---------	------------------	-----------------	--------------------------

Sterling Water (Veolia 100% following a buyout in 2009) gained the Eastern Scotland contract. The original Almond Valley and Seafeld GBP50million scheme for the upgrading of five sewage treatment works serving Edinburgh and replacing sewage sludge disposal to sea with land based recycling has been extended to include the GBP20million Esk Valley scheme. These contracts are operated by Veolia Water UK. The population covered will be 585,000 at the start, rising to 850,000 in an area covering 1million people at the outset and 1.2million at completion.

### Wales

2001	Wales	5&7 years, Customer Services	1.3million households
------	-------	------------------------------	-----------------------

The first contract was worth GBP68million to manage customer services for Dwr Cymru Welsh Water until 2005. The contract serves 1.3million connected properties, representing a population of over 3million. In 2005 it was renewed for up to 7 years.

### Acquisition of United Utilities' UK outsourcing contracts

In April 2010, VE acquired UU's outsourcing contracts serving various utilities in England, Wales and Scotland.

#### Scotland PFI

1998	Fort William	28 year PFI BOT	14,000 sewage treatment
1998	Inverness	28 year PFI BOT	66,000 sewage treatment
1999	Tay	28 year PFI BOT	270,000 sewage treatment
2001	Moray Coast	28 year PFI BOT	55,000 sewage treatment

These contracts were awarded by the North of Scotland Water Authority to Catchment Ltd, with UU responsible for the operation of the sewage treatment works through Caledonian Water. The GBP45million Highland scheme has two facilities, at Fort William (PE of 20,000 for GBP10million) and Inverness (PE of 125,000 for GBP35million), which are both fully operational. The Tay scheme (33% held by UU) is for a single site serving Dundee and Angus and entered service in March 2002 at a total cost of GBP120million. The GBP76million scheme for the Moray Firth involves three sewage treatment works and 25km of sewerage for the Moray Firth.

#### England, Wales and Scotland – Outsourcing contracts

During 2004-05, UU Contract Solutions (UUCS) gained GBP3.3billion in utility related contracts across the UK and revenues of at least GBP650million pa in the medium term. No contracts were subsequently gained, which fits in with a pattern of these contract awards in relation to the AMP cycles.

The four year operations contract with Glas Cymru for Dwr Cymru Welsh Water's (DCWW) operations started in April 2001. This contract was originally worth GBP450million and was expanded to GBP600million, covering both water and sewerage activities. To date, variable costs have been reduced by 20%. This was replaced with a 15 year, GBP1.5billion contract starting from April 2005, with five yearly reviews, which was wound up in 2010. In 2002, UUCS also gained a GBP15million water meter installation and replacement contract.

#### United Utilities water outsourcing contracts

Year	Client	Contract	Total value	Duration
2001	Welsh Water	Operations	GBP450million	4 years
2003	Scottish Water	Capex management (JV)	GBP1,100million	5 years
2004	Welsh Water	Operations	GBP1,500million	15 years
2005	Southern Water	Capex management (JV)	GBP750million	5 years
2006	Scottish Water	Capex management (JV)	GBP760million	4 years

The Southern Water contract is worth GBP300million to UU and covers 250 water and wastewater projects, while UU will be involved in managing water provision across Wales and sewage treatment in north Wales. UU is now involved in managing contracts covering 35% of the UK water sector's asset base and is involved in 60% of the 9% of the utilities market in the UK that has been outsourced to date. Scottish Water Solutions gained a contract starting in 2004 to manage GBP1.1billion of Scottish Water's GBP1.8billion 2001-06 capital spending programme. The GBP1.5billion 15 year contract serving Welsh Water awarded in 2004 was terminated at the start of 2010.

#### Ireland

2008	Castlebar	22 year BOT	20,000 wastewater
------	-----------	-------------	-------------------

The contract involves renovating and operating the WWTW to a PE of 35,000 (including 10,000 PE for industrial effluents) and will generate revenues of EUR26million.

2008	Mullingar	22 year BOT	28,000 wastewater
------	-----------	-------------	-------------------

Total revenues for the contract will be EUR48million including renovating a 55,000 PE sewage works which will cost EUR25million and is due to enter service in June 2010.

2006	Limerick	20 year BOT	90,000, wastewater
------	----------	-------------	--------------------

This is a EUR71million repair, enlargement and operation contract for the city's wastewater treatment plant, which will increase its treatment capacity from 51,000m<sup>3</sup>/day to 87,000m<sup>3</sup>/day.

## Germany

### Berliner Wasserbetriebe

Y/E 31/12 (EURmillion)	2004	2005	2006	2007	2008
Domestic revenues	N/A	N/A	1,123	1,117	1,172
International revenues	N/A	N/A	19	17	19
Services revenues	N/A	N/A	5	5	5
<b>Total turnover</b>	<b>1,228</b>	<b>1,234</b>	<b>1,147</b>	<b>1,139</b>	<b>1,193</b>
Net profit	62	85	89	150	136
Water sales in Germany (million m <sup>3</sup> )	201	197	202	200	193
Sewage treated in Germany (m m <sup>3</sup> )	232	227	231	241	233
Water sales - BWI (million m <sup>3</sup> )	N/A	N/A	N/A	87	N/A
Sewage treated - BWI (m m <sup>3</sup> )	N/A	N/A	N/A	415	N/A

BWB dates back to 1856, including 45 years with its services being divided by the Berlin Wall. In 1999, after the partial privatisation of BWB, Berlinwasser Holding AG was formed and BWB was vested into this company. The consortium (VE 50.1% and RWE 49.9%) acquired 49.9% of BWB for EUR1.69billion, with the majority 50.1% stake being held by the City of Berlin.

1999	Berlin	30 year concession	4.0million water & sewerage
------	--------	--------------------	-----------------------------

BWB serves 3.5million people in Berlin, operating nine water treatment works and six sewage treatment works. In addition water is provided to 90,000 people and wastewater treatment to 0.5million in Brandenburg via 10 water and 24 wastewater contracts with a total of 113 local authorities.

The sale by VE and RWE of 80% of Berlinwasser International to Marubeni in 2005 was rescinded in 2006 and in 2007 BWB decided to continue developing these activities. Please see the RWE company entry for BWB International's activities.

### Other contracts in Germany directly held by VE

1995	Döbeln/Oschatz	20 year management	135,000 water & sewerage
------	----------------	--------------------	--------------------------

Oewa (46% held by VE, a JV with Veba Kraftwerk Ruhr AG until 1998) gained a contract for Döbeln/Oschatz in Saxony with a turnover of DM17million, serving 135,000 people.

1999	Grimma	25 year concession	85,000 water & sewerage
------	--------	--------------------	-------------------------

The concession covers 19 communes in Saxony, 85,000 being served with piped water and 45,000 with sewerage. The contract is worth EUR153million over its life. Oewa Wasser und Abwasser GmbH mainly operates in Saxony-Anhalt, holding 25 contracts, including 6 gained via the 1994 acquisition of Awatech.

1999	Midewa	Acquisition	400,000 water & sewerage
------	--------	-------------	--------------------------

In December 1999, activities in Saxony Anhalt were boosted by the acquisition of Midewa, which has a turnover of EUR56million pa. 400,000 are included for water services and 200,000 for sewerage. VE also has a 25 year O&M contract for sewerage services in the Hanover area, with a turnover of EUR15million pa.

2001	Görlitz	Acquisition (74.9%)	80,000 municipal services
------	---------	---------------------	---------------------------

Saxony's Stadwerke Görlitz had a DM120million (EUR61million) turnover in 2000. It also provides waste management, water, sewerage, energy and public transport services to the town. In 2009, the electricity, heat and gas contracts were renewed.

2003	Gera	10 year BOT	165,000 water & wastewater
------	------	-------------	----------------------------

The contract is with the municipality of Gera in Thuringia. Total revenues for the contract will be EUR130million.

2004	Braunschweig	16 year BOT	250,000 water
------	--------------	-------------	---------------

Veolia Water acquired 74.9% of Braunschweiger Versorgungs AG (BVAG) in December 2004 for EUR372.5million. The company manages water and wastewater services for the city in Lower Saxony. The company will generate revenues of EUR270-300million pa from 2005.

2005	Braunschweig	30 year O&M	250,000 wastewater
------	--------------	-------------	--------------------

A subsequent contract, awarded in December 2005 covers the city's wastewater treatment plants run by Stadtentwässerung Braunschweig GmbH and is worth EUR390million.

2009	Burg	15 year O&M	Water & wastewater
------	------	-------------	--------------------

The contract with the regional Authority of Burg in Saxony-Anhalt is worth EUR20million.

## Belgium

2001	Brussels	20 year DBFO	1.1million sewage treatment
------	----------	--------------	-----------------------------

Construction of the Brussels North STW started in 2003, and the facility entered service in the first half of 2008. The contract is worth a total of EUR1billion over its life, including EUR290million in Capex and a fee of EUR49.6million pa for the Aquiris consortium. Treatment capacity will be 119million m<sup>3</sup> pa.

## Sweden

2001	Norrtaälje	10 year 'concession'	50,000 water & wastewater
------	------------	----------------------	---------------------------

The turnover over the life of the contract will be EUR25million. This is the first water PPP in Sweden. Veolia Vatten also operates the water and wastewater networks for the municipalities of Danderyd and Jarfalla, as well as pumping stations for Stockholms Lokaltrafik (SL).

## Norway

2003	Oslo	Construction/operation option	Water treatment
------	------	-------------------------------	-----------------

This is to be the largest water treatment plant in Norway, serving some 250,000 people and costing EUR73million in total, with completion planned for 2008. There is an option for a 15+5 year operations contract worth EUR102million.

## Italy

Until 2005, VE was effectively engaged in managing a portfolio of operating contracts and strategic stakes. The 2005 acquisition of Enel Hydro has more than compensated for the decision to sell its stakes in the two Genovan water companies to Amga. It is understood that VE continues to hold 72% of Siemec, a company providing sewerage and sewage treatment to 700,000 people.

## Acquisition of Enel Hydro

75% of Siciliacque, the entity running Sicily's water distribution system was sold to a VE and Enel joint venture in 2004 for EUR299million. The 40 year concession starts in 2004 and calls for investments of EUR1billion, including EUR300million in the first decade and reducing leakage from 30% to 12%.

Enel's water activities were sold to Veolia for EUR36million in May 2005. Enel Hydro SpA provides water to 6.1million people, mainly through Idrosicilia SpA which provides water management services in Sicily. VE acquired 100% of Enel Hydro in the deal, along with 20% of Idrosicilia and an option for Enel's remaining 40% stake in the latter company.

2001	Latina	30 year concession	600,000 water & wastewater
------	--------	--------------------	----------------------------

ATO de Latina covers southern Lazio's ATO-4, serving 38 communes. A consortium of VE (21.8%), Enel (23%) and Acquedotto Pugliese (23%) gained the concession in July 2001, after the tendering process had been held up by a dispute over the scoring system. The concession will be worth EUR2billion over its operating life. UFW needs to be decreased from 70% to 25-30% and major sewage treatment upgrades are also required. A further 500,000 tourists use the area.

2001	Calabria	30 year concession	752,000 water & wastewater
------	----------	--------------------	----------------------------

VE and Acquedotto Pugliese hold 49% of Societa Risorce Idriche Calabresi (So Ri Cal), serving the region of Calabria. The concession became operational in 2002 and involves ITL800billion of capital spending over its life, mainly during the first 8-10 years.

### Gruppo Camuzzi

Gruppo Camuzzi was founded in Milan in 1929. In October 2001, Mill Hill NV, the Dutch holding company of the Garilli family, sold 40% of its 100% holding in Gruppo Camuzzi to Enel for EUR434million. In March 2002, Enel bought the rest of Camuzzi for USD870million from Mill Hill NV. The company is principally engaged in gas services. In 1997, Camuzzi gained a 20 year concession contract for water and wastewater services for the town of Massa, serving 44,051 and 30,379 people respectively. Camuzzi's subsidiary Gazometri in total manages 5 concessions in Lombardy, Tuscany and Abruzzo and supplies 40,195 customers. 6% of the group turnover in 1999 was in environmental services.

### Argentina

1994/1996	Balacarse & Laprida	20 year concessions	45,000 water and wastewater
-----------	---------------------	---------------------	-----------------------------

The concessions cover two towns in the Buenos Aries region. Camuzzi holds 100% of Aguas de Laprida and 70% of Aguas de Balacarse. The concessions serve a total of 17,835 customers. USD3.54million has been spent on infrastructure development since 1994, with a 2001 turnover of USD1.74million.

### China

VE's consolidated revenues in China were EUR350million in 2003. It is by some way the fastest growing market VE is involved in and is set to become VE's largest international water services market in the medium term. VE currently has 20 municipal and 5 industrial contracts, serving some 30million people in China, including 21million via full service concessions.

2008	Changle	30 year management	Water
------	---------	--------------------	-------

The contract will generate revenues of EUR294million.

2007	Haikou	30 year management	800,000 water & wastewater
------	--------	--------------------	----------------------------

The Haikou (Hainan) contract was awarded in June 2007, following the acquisition of 49% of the operating company. The contract will generate revenues of EUR776million.

2007	Tianjin	30 year management	3million water
------	---------	--------------------	----------------

Veolia Water acquired 49% of the Tianjin Shibe Water Company Ltd from the Tianjin Water Works (Group) Company Ltd. The contract will generate revenues of EUR2.5billion. The project will cover the district of Shibe, the Northern part of Tianjin, and the Binhai district on the Eastern coast. It includes

managing the Xinkaihe water production plant (1million m<sup>3</sup>/day) and a 1,988 km of mains and the 500,000 m<sup>3</sup>/day Jinbin water treatment works, currently under construction. In addition, the company will develop the water conveyance network to all the industrial areas in the Binhai area, situated along the coast of Bohai Bay. 2008 revenues were EUR19million.

2007	Lanzhou	30 year management	3.2million, water
------	---------	--------------------	-------------------

This EUR1.6billion contract for the capital of Gansu Province was gained in January 2007. VE will hold 45% of the Lanzhou Water Supply Company. VE will manage four water treatment plants with a total capacity of 2,190,000m<sup>3</sup>/day and 640km of water mains.

2006	Liuzhou	30 year management	1.0million, water
------	---------	--------------------	-------------------

The August 2006 contract sees VE taking 49% of Liuzhou Water Services and responsibility for managing all water distribution services, including 4 water treatment plants with a combined capacity of 540,000m<sup>3</sup>/day. Revenues over the contract will be some EUR330million.

2005	Kunming	30 year BOT	3.5million, water
------	---------	-------------	-------------------

Signed in November 2005, this contract will generate EUR1,100million in revenues. VE and Citic Pacific will hold 49% of Kunming Water Supply and manage its 1.615million m<sup>3</sup>/day water treatment and distribution service. This contract generated EUR20million in revenues during the final seven months of 2006.

2005	Changzhou	30 year BOT	1,200,000 water management
------	-----------	-------------	----------------------------

Veolia Water and Citic Pacific acquired a 49% stake in the municipal company Changzhou Tap Water Group following an international tender. The contract is worth EUR800million and involves managing the company, including 5 water treatment plants (capacity 790,000m<sup>3</sup>/day), a 1,750km distribution network and customer services.

2005	Handan	25 year BOT	800,000 wastewater
------	--------	-------------	--------------------

This contract involves the construction of a new wastewater treatment plant with a capacity of 100,000m<sup>3</sup>/day and its operation for 25 years. The Veolia Water Systems contract will have total revenues of EUR62million.

2005	Urumqi	23 year BOT	1,200,000 wastewater
------	--------	-------------	----------------------

The contract serves the capital of the Xinjiang Uyghur Autonomous Region and involves upgrading and operating for a 23-year period of the city's wastewater treatment plant, in partnership with Beijing Capital Group (BCG). The plant's current capacity of 200,000m<sup>3</sup>/day will increase to 400,000m<sup>3</sup>/day by 2008. Total revenue for Veolia Water for the contract will be EUR260million.

2003	Shenzhen	50 year BOT	7,610,000 water & wastewater
------	----------	-------------	------------------------------

This contract is being jointly operated with Beijing Capital Corporation (see company entry) and will generate revenues totalling EUR8.5billion. 45% of the contract company is held by VE and BCG and 55% by the Shenzhen municipalities. VE is investing EUR390million into the project. At the start of the project, 2.6million people were served. The contract contributed EUR103million to VE's 2008 consolidated revenues. In 2009, Shenzhen Water Group acquired five companies which manage water services in the district of Baoan.

2004	Weinan	22 year BOT	300,000, water
------	--------	-------------	----------------

This is a EUR190million rehabilitation and operation contract for bulk water services, providing 160,000m<sup>3</sup>/day.

2004	Hohhot	30 year BOT	2.5million, water
------	--------	-------------	-------------------

The rehabilitation and operation of the Inner Mongolian capital's water production and treatment system (10 plants) has a capacity of 515,000m<sup>3</sup>/day and will generate revenues of EUR600million.



2004	Beijing	20 year BOT	Wastewater
------	---------	-------------	------------

The Bei Yuan wastewater treatment plant is adjacent to the Olympic Village and the contract will generate total revenues of EUR20million.

2004	Zunyi	35 year concession	600,000 water
------	-------	--------------------	---------------

Zunyi is in Guizhou Province. This rehabilitation and operation contract is being carried out jointly with Citic Pacific (see company entry) and will generate total revenues of EUR210million.

2003	Qingdao	25 year BOT	1million wastewater
------	---------	-------------	---------------------

The contract (with China Everbright) covers the operation of two wastewater treatment works for the 2008 Beijing Olympiad. Revenues will total EUR110million. The capacity of the Maidaao plant was increased from 80,000m<sup>3</sup>/day to 140,000m<sup>3</sup>/day in 2006.

2003	Beijing	20 year BOT	250,000 wastewater
------	---------	-------------	--------------------

Veolia Water and Kerry Utilities (part of PPB of Malaysia), signed a 20 year contract to operate the Lugouqiao wastewater treatment plant, located in the east of Beijing. Total revenues will be EUR50million. This is the first private sector WWTW contract for Beijing and will be financed through a World Bank loan to the Beijing municipality with VE and Kerry providing an additional EUR5million. The plant will cost EUR40million.

2002	Baoji	BOT, 23 year	500,000 bulk water supply
------	-------	--------------	---------------------------

VE is to refurbish the city's two WTWs and to expand their capacity. Revenues over the life of the contract will be approximately EUR300million.

2002	Zhuhai	BOT, 30 year	1,200,000 bulk water supply
------	--------	--------------	-----------------------------

VE is to refurbish one WTW and to construct a second facility. Revenues over the life of the contract will be approximately EUR400million.

2002	Shanghai	50 years, O&M	2.2million water services
------	----------	---------------	---------------------------

In May 2002, VE gained the water O&M contract for the Pudong business district in Shanghai. This is the first outsourcing contract to give a foreign company the responsibility for providing a full service offering: embracing drinking water production, network distribution and customer services. Veolia Water has bought a 50% share in a new JV company, Shanghai Pudong Veolia Water Corporation, for an amount of EUR266million. At the start of operations, the contract will supply potable water to 535,000 domestic connections and 18,000 commercial and industrial customers with an average daily consumption of 1.2million m<sup>3</sup>. An immediate priority has been reducing distribution losses from their 30% level. The entire Pudong area currently has 2.4million residents. The 50-year contract is expected to generate a turnover of over EUR10billion during the term due to the expected substantial growth of Pudong in the coming years. The business district is forecast in the long-term to be home to 5million people.

1998	Chengdu	BOT, 18 year	2.66million bulk water supply
------	---------	--------------	-------------------------------

The BOT contract was awarded to Chengdu Générale des Eaux-Marubeni Waterworks (CGDEM), a JV with Marubeni (60% VE, 40% Marubeni). This is the first wholly foreign owned BOT water supply project in China. The project for Sichuan's capital cost USD100million, USD90million going on the treatment plant. It supplies 460,000m<sup>3</sup>/day of water. Construction took 30 months and includes 27km of pipelines. Chengdu has a total population of 10million, of whom 3.2million live in the central area. The Chengdu Municipal Waterworks General Company currently serves 2.66million people.

1997	Tianjin	'Concession-type', 20 year	1.85million water treatment
------	---------	----------------------------	-----------------------------

This was awarded for upgrading the Lingzhuang water treatment works, which has a 500,000 m<sup>3</sup>/day capacity and is one of the Tianjin's largest facilities, providing water to one third of the 11million served by the municipality. The facility is to have its capacity increased by 250,000m<sup>3</sup>/day in the medium term. The contract generates bulk water sales of USD15million pa, with an agreed Capex of

USD30million for plant rehabilitation and the building of a new 13km piping network. CGE Tianjin Waterworks holds the concession, which is 55% held by a JV which is in turn 70% owned by VE and 45% held by the municipality's Tianjin Waterworks Co.

### Kazakhstan

VE was awarded two contracts in March 2000: (1) A 30 year water management contract for the old capital Almaty (1,250,000 people) and (2) A USD40million contract for pipeline and pumping station renovations for the new capital Astana (300,000, to grow to 500,000). The Almaty contract never started due to delays by the Government causing VE to pull out. VE retains an industrial water services presence in the region.

### Republic of Korea

2004	Kumdan	23 year BOT	150,000, wastewater treatment
------	--------	-------------	-------------------------------

The Kumdan WWTW is located near Incheon. The facility will have a capacity of 40,000m<sup>3</sup>/day and will generate consolidated revenues of EUR80million. The contract is jointly run by Hanwha Engineering & Construction Corporation & Doosan Construction & Engineering.

2001	Incheon	23 year BOT	260,000 sewage treatment
------	---------	-------------	--------------------------

The Incheon contract (Samsung Veolia Incheon Wastewater Co., Ltd., VE 80%, and Samsung Engineering 20%) involves USD300million being spent on two sewage treatment works (Mansu, 70,000m<sup>3</sup>/day and Songdo, 30,000m<sup>3</sup>/day) with a total capacity of 100,000m<sup>3</sup>/day. The two facilities entered service in April 2005.

### Japan

VE has had a low key presence in Japan, being involved in short term wastewater maintenance contracts for some years. Major contracts have been gained since 2006, including two three year O&M wastewater treatment works in 2006 (Saitama, a district near Tokyo and for Hiroshima), which were renewed for a further 3 years in 2009, with total revenues of EUR21million. In April 2007, VE gained a three year O&M contract for a 283,000 m<sup>3</sup>/day wastewater treatment plant serving 500,000 people in Chiba, which will generate total revenues of EUR17.8million. In 2009, a second EUR35million three year wastewater outsourcing contract was gained for Chiba.

In July 2007, Veolia Water Japan and J-Power (Japan's Electric Power Development Co) acquired Fresh Water Miike, a water management unit of Mitsui Mining Co. This company, now named Fresh Water Service Co provides water services for half of the households in Omuta, Fukuoka Prefecture and the neighbouring Arao in Kumamoto Prefecture. VE made four further acquisitions of water technology companies in Japan during the first half of 2008:

Company	Revenues	Revenue year
Nishihara Environment Technology	EUR38million	2007
Dai Nippon Eco Engineering	EUR8million	2008
Yamagata Kangyo Engineering	EUR4million	2007
Nichijo	EUR7million	2006

### India

VW India gained a four year performance contract to provide continual water supplies at various pilot locations in the state of Karnataka, serving 200,000 people through 33,000 connections including 10,000 social connections.

2007	Nagpur	5 year O&M	100,000 water
2008	Nagpur	15 year DBO	650,000 water

Revenues for the 30 month construction and 15 year operations contract will be EUR24million, including construction. The 240,000 m<sup>3</sup> per day water treatment plant contract was awarded in June 2008 and builds upon an earlier rehabilitation contract and a pilot services upgrading project designed to provide a continual water supply for 10,000 customers (100,000 people) in the city.

### Indonesia

1997	Sidoarjo	25 year BOT	100,000 bulk water supply
------	----------	-------------	---------------------------

This concession is for bulk water provision to PDAM Delta Tirta Sidoarjo, the local water entity. The concession holds 95% of the equity, along with Indonesia's PT Agumar Nusa and PT Hansa Letsari. The build and management concession will entail a capital investment of INRR130billion, or a EUR4million investment by Veolia Water. The facility will have a 20,000m<sup>3</sup> day capacity, for 100,000 people.

### Philippines

The 1998 Fort Bonifacio concession was sold to a third party in 2007.

2000	Manila	25 year concession	Water supply and sewerage
------	--------	--------------------	---------------------------

The concession for the Clark Economic Zone is similar to the Fort Bonifacio contract. In this case, it is for a 4,400ha site earmarked for future development, where EUR25million will be spent developing the basic water and wastewater infrastructure in the first three years of the contract.

### Malaysia

The company gained its first concession in 1995 and has made further progress by working with local companies so as to take over the operation of their concession contracts.

1995	Selangor	25 year O&M contract	1.4million water provision
------	----------	----------------------	----------------------------

The Selangor contract involves bulk water provision for the entire state. This involves the management and rehabilitation of the state's 26 water treatment plants with VE as a subcontractor to Puncak Niaga.

### Gabon

1997	SEEG	20 year concession	910,000 utility services
------	------	--------------------	--------------------------

VE won the tendering process to acquire a 51% stake in the Gabonese public utility Société d'Electricité et d'Eau du Gabon (SEEG), with 49% of SEEG held by local investors. This is a XAF700million concession for water production and electricity distribution to the three principal cities; Libreville (422,000 people served with water), Port-Gentil and Franceville, including XAF200million for water. Average tariffs fell by 17% at the start of the contract and have been held to less than the rate of inflation since then.

Water coverage	1993 coverage	2000 target	2000 actual
Libreville	49.3%	53.0%	61.3%
Franceville	38.6%	43.0%	58.0%
Port Gentil	37.7%	43.0%	49.5%

There were 100,385 customer connections in 2005, including 17,978 which have subsidised connections using less than 15m<sup>3</sup>/month. By 2006, the connection rate had risen from 40% to 70%, with 192,000 people in worse off areas being connected to water and sewerage since 2002. 920,000 are currently provided with electricity services and 607,000 with water services out of the country's population of 1.3million.

### Niger

2000	SEEN	10 years, management	Up to 2.1million, water
------	------	----------------------	-------------------------

Supported by USD65million in funding by the World Bank's IDA, the French Development Agency and the West African Development Bank, this 10 year affermage contract for Société d'Exploitation des Eaux du Niger (SEEN, 55% VE, 45% local investors) covers 52 urban centres and charges on average XOF208/m<sup>3</sup> (EUR0.3) for drinking water. Between 2001 and 2005, the number of connections rose from 58,000 to 79,433, including 11,688 new low cost connections. Niamey (600,000 people) is the initial target area, with other addressable markets to be covered later. The contract will be worth a total of EUR150million and aims to serve 1million people when fully operational. Bill collection rates

were 97% in 2004, reflecting a programme to optimise affordability for all clients, with 84% network efficiency and 97% water quality compliance in 2005.

### Burkina Faso

2001	Ouagadougou	5 year support services	900,000 water
------	-------------	-------------------------	---------------

VE, along with local companies Cabinet Mazars and Guerard was awarded a five year support services contract supported by the World Bank to expand services for the city aiming to cover 0.9million people.

### Chad

2000	STEE	Phased PPP	Up to 7million water
------	------	------------	----------------------

Société Tchadienne d'Electricité de l'Eau (STEE), Chad's water and electricity utility, may undertake a series of PPP exercises, involving greater degrees of private involvement over a series of phases. An O&M contract started in 2000, but little evidence of this contract developing has since been noted.

### Morocco

In 2008, VE created a NAM1 a joint venture with the Mubadala Development Company, 49% held by MDC and 51% by VE, into which VE's activities in Morocco and the Middle East were transferred.

The two concessions currently serve 3.6million people in 38 local authorities through 738,500 electricity and 588,500 water customer connections including 48,500 low cost water and sewerage connections. 3.2million people are served with water and sewerage. A particular emphasis has been placed on water network efficiency:

% efficiency	2002	2004
Tangier	60.9%	73.4%
Tétouan	52.7%	66.0%
Rabat	68.0%	81.7%

By 2009, 300,000 people had been connected to the water service via 60,000 subsidised connections.

2001	Tangier & Tétouan	25 year concession	Up to 1.4million water & electricity
------	-------------------	--------------------	--------------------------------------

The concession serves a total of 23 districts within the two cities. VE (51%) is the lead company in Amendis a consortium comprising ONA of Morocco, SOMED (Morocco and UAE) and Canada's Hydro Quebec. The two concessions cover water & wastewater and electricity services for 23 districts within the two cities, serving a total of 1.4million people; 780,000 in Tangiers and 630,000 in Tetouan. The Tangiers contract was designed to generate revenues of EUR66million pa from 2001 and the Tétouan contract will generate revenues of EUR39million, with combined revenues of EUR130million pa by the fifth year. The concessions involve network and service maintenance, with an emphasis on extending and rehabilitating sewerage services. The concessions will also be designed to take into account the population growth anticipated over the duration. 28,500 low cost water and wastewater connections have been made to date, along with the aim of 90% sewerage coverage by 2008.

1999	Rabat	30 year concession	Up to 2.2million, water & sewage
------	-------	--------------------	----------------------------------

The EUR4.6billion utility privatisation for Rabat and Sale was awarded to Redal, Dragados' consortium with Electricidade de Portugal, Pleiade (Portugal) and Alborada (Morocco). Rabat's utilities serve 1.7million people, with a EUR138million (USD130million) turnover for water, sewerage and electricity services in 1998. 84million m<sup>3</sup> of water was delivered in 2000. Dragados sold its stake to VE in November 2002. MAD700million (EUR64million) was invested in the area in 2003, including MAD350million in wastewater treatment facilities, concentrating on a new WWTW in Skhirat. 15,000 low cost water connections and 20,000 low cost sewerage connections have been made since 2002.

### Lebanon

2009	Tyr Sour	5 year BO	Wastewater
------	----------	-----------	------------

A EUR31million contract for the construction and operation of a wastewater treatment plant.

#### **Qatar**

2009	Doha	7&3 year O&M	500,000 wastewater treatment
------	------	--------------	------------------------------

The contract covers two WWTWs, Doha South (112,000m<sup>3</sup> per day) and Industrial Area (12,000m<sup>3</sup> per day) with an initial contract value of EUR44million, plus a EUR15million extension option. The facilities offer full water recovery for irrigation and agriculture.

#### **Oman**

2006	Muscat	5&3 year management	700,000 wastewater treatment
------	--------	---------------------	------------------------------

A five-year management contract with a three-year extension option was awarded by the Oman Wastewater Services Company in June 2006 to assist in the management of wastewater services in Muscat. OWSC is responsible for all wastewater services in Muscat under a 30 year concession agreement at the beginning of 2006 with the Government of Oman for the acquisition, development and operation of Muscat's wastewater collection and treatment system.

2007	Sûr	22 year BOO	350,000 water provision
------	-----	-------------	-------------------------

In January 2007, VE gained a EUR434million 22 year contract to build, finance and operate a 80,200m<sup>3</sup>/day RO desalination plant for the city of Sûr and the surrounding region of Sharqiyah. The facility will cost EUR111million to construct in partnership with Bahwan Engineering Co (VE 60%, Bahwan 40%).

#### **Saudi Arabia**

In April 2008, Veolia Water AMI was awarded a six year EUR40million incentive-based management contract for improving aspects of the management of the 10,000km Riyadh water supply system and the 4,500km sewerage system. The former will involve reducing leakage from its current 50% level and the latter in improving the connection rate of the city, where currently 2.0million of the 4.5million inhabitants are connected to the system.

#### **United Arab Emirates**

2007	Fujairah	12 year O&M	130,000, desalination
------	----------	-------------	-----------------------

Veolia Water was awarded a contract to operate and manage the reverse osmosis desalination plant at the F2 IWPP project in Qidfa, Fujairah in December 2007. There is a three year pre-operational phase prior to the facility entering service in 2010.

2007	Abu Dhabi & Al Ain	27 year BOT	1.2million, wastewater
------	--------------------	-------------	------------------------

A EUR461million contract (including construction), which was announced in July 2008. The Abu Dhabi (850,000 people in 2008) plant will have a 300,000m<sup>3</sup> per day capacity and the plant serving the emirate's second city, Al Ain (348,000 people in 2003) will treat 130,000m<sup>3</sup> per day. Construction will take 3 years, with a 25 year operating contract on completion. The shareholding is similar to the Ajman concession. In addition, VE has a DBO contract (the 3 year operating phase generating revenues of EUR10million) to treat the water in the artificial lake by the Burj Dubai Tower which was also gained in 2008.

2006	Ajman	27 year Concession	235,000 wastewater treatment
------	-------	--------------------	------------------------------

The concession was awarded in February 2006 to Moalajah. This company is managing the concession and is 67% owned by VE and 33% by Besix of Belgium. The concession company is in turn 50% held by Besix, 20% by VE, 10% by Black & Veatch and 20% by the Ajman Government. A 90,000m<sup>3</sup>/day facility was constructed from 2007-09, along with 230km of sewerage and the contract will generate EUR151million in revenues. This supersedes the Thames Water/Black & Veatch BOT, whereby a USD100million refinancing, using the first monoline credit facility in the Middle East formed part of Thames Water selling its 60% stake in the original 2003 concession to the new holders.

#### **Israel**

2001	Ashkelon	25 year BOT	1.4million water desalination
------	----------	-------------	-------------------------------

VID Investment Consortium, comprising VE, IDE and Dankner of Israel gained the BOT contract. VE holds 50% of OTID, the construction company's equity, and 49.5% of ADOM, the operating company. The contract covers the construction and operation of two 54million m<sup>3</sup> pa facilities, the largest membrane sea water desalination plant in Israel. Total revenues will be EUR900million, with the plant costing USD110million to build. The provision price of USD0.527/m<sup>3</sup> was well below expectations due to new technologies purchased by VE and a relatively low cost of capital. The facility entered service in 2003 with full capacity in 2005.

### Australia and New Zealand

United Water was set up in 1995 to bid for the Adelaide contract, as a vehicle for securing business for the state in other parts of Australasia. VE bought out Thames Water, its United Water joint venture partner in 2005.

### Australia

VE serves 2.1million people in Australia. In December 2006, VE was appointed as a consultant to the State of Queensland for the development of all installations and infrastructure, and will then operate these installations. This project, whose completion is anticipated for the end of 2008, represents a global investment of EUR1.2billion for the State of Queensland.

2008	Sydney	20 year BOT	wastewater
------	--------	-------------	------------

A EUR99million contract for the Rosehill and Camelia WWTWs located to the west of Sydney.

2006	Queensland – I	DBO	Wastewater recovery
------	----------------	-----	---------------------

The first contract involves the recycling of wastewater from sites at Oxley, Wacol, Goodoa and Bundamba, Luggage Point and Gibson Island. The volume of water treated by microfiltration or ultrafiltration, reverse osmosis and UV, will be 232,000m<sup>3</sup>/day. The water will be used by industrial customers. The facilities entered service in 2008.

2006	Queensland – II	105 year DBO	450,000 water
------	-----------------	--------------	---------------

A 125,000m<sup>3</sup>/day desalination plant will supply residents of the Gold Coast and the South Eastern Region of Queensland. The 10 year O&M phase can be extended by a further five years. The initial O&M phase will generate revenues of EUR210million.

1995	Adelaide	15.5 year BOT	1.2million water & sewerage
------	----------	---------------	-----------------------------

This was the first contract gain by the TWI/VE UW alliance. It is now 95% owned by Veolia Water. The project involves AUD630million of construction work and the concession is generating revenues of AUD60million per annum. The contract involves the construction and operation of six water treatment plants and four sewage treatment plants and allied distribution infrastructure. The first phase entered service in 1996 and the construction project was completed in 1998. VE was not shortlisted for the renewal of the contract from 2011.

2006	Ballarat	15 year BOOT	115,000 wastewater
------	----------	--------------	--------------------

A EUR43million construction and operation contract for a wastewater treatment plant to serve the city.

1999	Ballarat	25 year BOOT	105,000 water supply
------	----------	--------------	----------------------

UW is responsible for the O&M element of the contract originally awarded to Thames Water. The contract generates revenues of AUD2.7million per annum. An additional 20 year contract covering four local water works was gained in 2003 serving 5,000 people in the neighbouring towns of Beaufort, Blackwood, Clunes and Forest Hill.

Other contracts are operated through General Water Australia.

1996	Sydney	25 years, BOO	500,000 water treatment
------	--------	---------------	-------------------------

The AUD180million treatment Wyuna Water project currently handles 370MI/day and can be further upgraded to 534MI/day. The Woronora plant (160MI/day, upgradable to 210MI/day) entered service in April 1997 and the Illawarra Plant (210MI/day, upgradable to 314MI/day) in December 1996.

2007	Sydney	23 years, DBO	500,000 water treatment
------	--------	---------------	-------------------------

This is a reverse osmosis desalination plant with an initial capacity of 250,000m<sup>3</sup>/day which can be expanded at a later date to 500,000m<sup>3</sup>/day. The EUR540million contract includes a three year construction phase followed by a 20 year operating phase.

1998	Noosa	15 years DBO	60,000 water treatment
------	-------	--------------	------------------------

This involves a holiday resort in Queensland with an off-season population of 44,000. The 45L/day facility entered service in December 1999.

2000	Coliban	25 years BOOT	80,000 water treatment
------	---------	---------------	------------------------

The Aquia 2000 project for Victoria's Coliban Water Authority consists of three WTWs serving Bendigo (126ML/day), Castlemaine (18MI/day) and Kyneton (8MI/day).

2001	NSW	20 years DBO	11,000, wastewater
------	-----	--------------	--------------------

A sewage treatment works for the townships of Gerringong and Gerroa, 120km south of Sydney. The facility entered service in August 2002 and the recovered water is used for farm irrigation.

2000	Mafra	10 year BOT	Water treatment
------	-------	-------------	-----------------

The USD10.6million contract is for an industrial water treatment facility in the state of Victoria.

### New Zealand

1997	Papakura	30 year BOT	42,000 water & sewerage
------	----------	-------------	-------------------------

Papakura is an urban district of Auckland. The AUD120million contract was awarded to UW in 1997 and it generates revenues of AUD6.3million per annum.

2002	Ruapehu	10 year O&M	15,000 water & sewerage
------	---------	-------------	-------------------------

In November 2002, UW started a 10 year O&M contract with the Ruapehu District Council, a rural region of approximately 15,000 residents located 320km south of Auckland. The contract covers rural water and wastewater treatment facilities, 117km of water pipes, 97km of wastewater pipes, 3,670 wastewater connections, 4,570 water connections and 38km of stormwater pipes.

2004	Thames-Coromandel	10 year O&M	25,000 water & sewerage
------	-------------------	-------------	-------------------------

Thames-Coromandel District is in the North Island. It has a residential population of 25,000 rising to 150,000 during the summer. There are 14,650 water and 18,100 wastewater connections.

1995	Wellington	25 year DBO	170,000 sewerage
------	------------	-------------	------------------

Two sewage treatment works have been constructed at a total cost of NZD149million (GBP50million), along with a sludge de-watering plant and a 1.8km long sea outfall at Moa Point. The construction phase ended in 1998, and the facility is now in service, with a 21 year operating contract. United Water acquired Anglian Water International (NZ) in June 2004.

### Latin America

Turnover for Proactiva Medio Ambiente was EUR443million in 2000, with net profits of EUR7.3million. Revenues have been impacted by currency weakness and fell to EUR145million in 2002 and was EUR153million in 2008, with an operating income of EUR16million.

**Argentina**

Proactiva Medio Ambiente was awarded the Catamarca contract in April 2000 for water supply management for the departments (parts of the town) of Capital, Vallejo Viejo and Fray Mamerto Esquiú in the province of Catamarca, in the northwest part of the country. It was rescinded in 2006.

**Venezuela**

1997	Monagas	30 year concession	552,000 water
------	---------	--------------------	---------------

Proactiva Medio Ambiente Venezuela gained the Hidrocapital concession for the water supply and sewerage for the north east sector of Caracas in July 2002. The service area has 650,000 inhabitants. Forecast revenue is USD2million pa.

**Colombia**

1998	Bogotá	20 year BOT	2million water
------	--------	-------------	----------------

This is the contract for upgrading and expanding the TIBITOC water treatment works in consortium with 2 local partners, with Proactiva holding 33% of the equity. The contract involves USD78million in investment, USD22million in the first 3 years. Total contract revenues will be USD300million. The plant has a capacity 900,000m<sup>3</sup>/day serving some 2million people.

1996	Tunja	20 year concession	151,000 water & wastewater
2000	Monteria	20 year concession	329,000 water & wastewater

The Monteria concession was gained by Proactiva Medio Ambiente in December 1999 and will generate COP29billion in revenues, with COP10.5billion in investments over the contract life. It serves 329,000 with water and 124,000 with sewerage. The Tunja concession serves 151,000 with water and 148,000 with sewerage.

**Brazil**

1998	Parana	Strategic stake acquisition	8.1million water & sewerage
------	--------	-----------------------------	-----------------------------

The operating consortium paid BRL249.8million (USD217million) for 40% of Sanepar, the water and sewerage company serving the state of Parana, with Proactiva holding a 35% stake in the consortium. Since 2003, VE's role in the concession has been eased.

**Ecuador**

2001	Guayaquil	30 year concession	2.5million water & wastewater
------	-----------	--------------------	-------------------------------

International Water (Edison/Bechtel) sold its 90% holding in International Water Services (Guayaquil) Interagua C.Ltda (ECAPAG) to Proactiva in December 2008. Edison wrote down EUR12million on the sale. The principal targets in 2001 were to reduce non revenue water from 70% to 30% and to connect 300,000 people in informal settlements, especially in Isla Trinitaria, where by 2004 piped water was made available for a seventh of the cost of the water vendors.

International Water Services (Guayaquil), contribution to Edison's profit and loss account

EURmillion	2004	2005	2006	2007
Revenues	27	31	34	29
EBITDA	4	8	10	7
Capital spending	N/A	N/A	8	13

During the first five years of the concession, Interagua invested USD50million in extending services to the city, connecting 40,000 new clients to the city's mains water and 20,000 to sewerage systems. Between 2006 and 2011, the company will invest USD250million in new infrastructure, with the aim of providing water services to 95% of the city's residents and sewerage for 90%. A cross subsidy rate scheme ensures that industrial clients subsidise in part the water that is used by residents. In June



2010, Interagua announced plans for a feasibility study into a proposed USD120million wastewater treatment works.

### Mexico

VE's JV company, Omsa, operates four contracts serving a total of 6million people. Since 1993, VE's stake in Omsa has increased from 33% to 38% in 1996, to 45% in 1997 and to 50% in 1998. ICA, VE's partner, is a Mexican civil engineering and construction company. Caasa serves 506,000 people in the city and more than 300,000 in the surrounding areas; 851,000 with water and 843,000 with sewerage. The 30 year concession was granted in October 1993 and is 90% held by Proactiva.

Sapsa (Mexico City)	2.43million	Water management services (1993-2009)
Caasa (Aguascalientes)	0.85million	Water and waste water concession
Puebla	1.20million	Water and waste water concession
Acapulco	1.50million	Water and waste water concession

### USA

US Filter's (USF) involvement in public-private partnerships (PPPs) goes back to the first partnership for water services in the USA awarded in 1972. The management contract for Burlingame's (CA) wastewater treatment facilities remains in USF's hands. The Bethlehem Steel contract signed in 1950 was the first industrial outsourcing contract in the USA. Upon the purchase of US Filter by Veolia Environnement in 1999, US Filter and the former Professional Services Group of Aqua Alliance were merged to create North America's largest water and wastewater outsourcing company, in 2003 serving 14million people in 600 communities and thousands of companies across all industrial and commercial markets through 91 water and 185 wastewater treatment plants. According to Public Works Financing, US Filter has been the North American market leader in PPPs in recent years. Following the sale of the non-core activities, USFilter Operating Services has been renamed Veolia Water North America (VWNA).

2009	Mapleton	15 year O&M	water
------	----------	-------------	-------

The contract will generate revenues of USD29million.

2008	Oklahoma	4 year O&M	water
------	----------	------------	-------

This is an extension of a contract that has been running since 1985 and the latest phase will generate total revenues of EUR29million.

2008	New London	10 year O&M	50,000, water & wastewater
------	------------	-------------	----------------------------

New London is in Connecticut. The contract will manage the sewerage services for 14,000 customers and water services for 6,000 customers with total revenues of EUR37million.

2007	Milwaukee	10 year O&M	1.1million, wastewater
------	-----------	-------------	------------------------

Awarded in December 2007, the EUR272million contract covers the management of the regional liquid waste management network of Milwaukee, Wisconsin and management of the production of Milorganite, fertiliser granules produced by the drying of residual mud from the waste water purification plant.

2007	Tampa Bay	16 year DBO	Water treatment
------	-----------	-------------	-----------------

A USD158million contract to expand the regional water treatment plant in Florida from 272,500 m<sup>3</sup> per day to 454,200 m<sup>3</sup> per day, which will enter service in 2010. VE will operate the facility for 13 years from then.

2006	NY State	7 year DBO	Wastewater treatment
------	----------	------------	----------------------

A USD 45million contract for the 1.5million gal/day (7,000m<sup>3</sup>/day) facility serving Rockland County.

2005	Gresham, Oregon	7 year O&M	106,000 wastewater treatment
------	-----------------	------------	------------------------------

The contract is worth USD21million and involves handling 20million gal/day of effluent.

2004	Richmond, CA	18 year O&M	wastewater treatment
------	--------------	-------------	----------------------

The contract is worth EUR50million.

2004	Virgin Islands	20 year BOT	75,000 wastewater treatment
------	----------------	-------------	-----------------------------

Two 18,000m<sup>3</sup>/day wastewater treatment facilities are to be constructed at St. Croix and St Thomas. Both facilities were expected to enter service at the end of 2006, generating revenues of USD126million throughout their contracts. There is also a five year renewal option.

2002	Indianapolis, IA	20 year O&M	800,000 water treatment
------	------------------	-------------	-------------------------

At USD1.5billion, it is the largest PPP in the United States' history. The system produces an average of 138million gal/day for residents in the city and within a 25 mile radius around the city.

2002	Atlanta, GA	10 year O&M	Manage city-wide biosolids system
------	-------------	-------------	-----------------------------------

USD200million agreement to produce and market 100 dry tonnes/day of biosolids. VWNA is the leading biosolids services supplier in the U.S., serving 130 different communities. The contract was terminated by Atlanta in 2006.

### Canada

Veolia Water Canada (VW Canada) is a subsidiary of VWNA. Its activities draw from the USF operations and, since 1976, VW Canada has gained 22 municipal O&M contracts. With the exception of Moncton (New Brunswick) all identified contracts are in Ontario.

2006	Brockton	Five years, O&M	10,000, water & wastewater
------	----------	-----------------	----------------------------

The contract announced in July 2006 involves the management of three water treatment plants with a capacity of 2.29mg/day and one wastewater treatment plant with a capacity of 1.98 mg/day. Revenues will be USD0.47million pa.

1997	Haldimand/Norfolk	O&M	200,000, wastewater
------	-------------------	-----	---------------------

The original contract in 1997 was for both counties. In 2004, separate contracts were drawn up for each county. The Norfolk contract covers three WWTWs with a capacity of 24mg/day and the Haldimand contract is for four WWTWs with a capacity of 16mg/day.

1999	Toronto	15 years, DBO	1,000,000, wastewater biosolids
------	---------	---------------	---------------------------------

The contract covers the biosolids dryer and pelletiser facility serving the city's 216mg/day Ashbridges Bay WWTW.

1998	Moncton	20 years, DBFO	100,000, water
------	---------	----------------	----------------

This was the first major PPP contract gained in Canada. It was agreed in April 1998 and covers a 94,635m<sup>3</sup>/day (25mg/day) water treatment facility. The CAD85million contract will save the city some CAD12million on anticipated capital costs.

Six other contracts have been identified:

Location	Date	Population	Service
Bayfield	N/A	2,000	Water
Georgian Downs	2001	1,000	Wastewater
Goderich	2000	15,000	Water & wastewater
Huron-Kinloss	2003	N/A	Water
Port Stanley	1997	2,500	Wastewater
Varna	2001	500	Water

### VE in industrial outsourcing

21% of VE's water turnover in 2000 was with industrial clients, which rose to 33% by 2006. VE's industrial outsourcing contracts have a typical duration of between 3 and 10 years, although an increasing number of contracts now run for 15 or 20 years. Overall multiservice revenues were EUR400million in 2003, rising to EUR440million in 2006, with EUR370million in large industrial client contracts gained that year. During 2003-04, Veolia Environnement signed several multiservice contracts (water, waste and energy) with industrial customers for cumulative revenues of around EUR1.25billion. VE's multiservice customers include Arcelor, Aventis, BP, Novartis, PSA, Renault, Solvay and Total. Veolia's 15 year contract with Renault was expanded in 2006 to include a five year management contract covering all service facilities in the Paris region with the aim of cutting expenditure by 20% during this period. The Novartis contract was renewed for 7 years in December 2007 and will generate EUR980million in revenues.

### **Industrial outsourcing in the Americas**

In the US, USF enjoyed a 53% market share for identified industrial water and wastewater outsourcing services in 2002, according to Public Works Financing. Major recent developments include a 20 year, USD66million contract with Alon, USA, to manage the water, wastewater, sludge and groundwater facilities at its Big Spring refinery in Texas and the acquisition of MCS Technologies LLC, a leader in the refinery waste separation and treatment services market, based in Corpus Christi, Texas. The 15 year IPSCO Steel contract was gained in 1999 while the USD100million Sunoco contract was gained in 1998. Contracts gained in 2000 include Westlake (15 year, USD75million), Conoco (USD30million), GM (USD30million) and BP (USD1.3million). In 2001, VE gained a EUR300million 15 year industrial services contract for Usinor's Vega do Sul facility in Brazil. The 10 year effluent management contract for Millennium Chemicals, signed in 2001, is worth EUR165million.

In 2003, USF gained contracts with the Dupont and Kerr-McGee chemical and energy groups for terms of between 15 and 20 years with an aggregate estimated total revenue of more than USD100million.

### **Industrial outsourcing in Europe**

Veolia Water Industrial Outsourcing provides water and wastewater management services to industrial customers in the UK and Ireland. Contracts include a 10 year contract with Shell to supply all of their chemical and oil refineries on site with up to 3,500m<sup>3</sup>/day of softened water on a DBO basis, and a 10 year O&M contract with Mettis Aerospace (the aerospace component manufacturer) regarding its effluent treatment plant as well as to supply its manufacturing operations with recycled process water. During 2002, a EUR27million 15 year contract with Arcelor Packaging and a EUR11million 12 year contract with Smurfit Cellulose du Pin were gained in France, both for effluent treatment.

In October 2001 VE acquired Depurazioni Industriali (DI) from Italy's Montedison. DI specialises in the treatment of industrial waste water, and generated EUR8million in revenues in 2001. The company owns three plants where it treats effluent from three industrial sites operated by Montedison's Cereol and Novaol under 20-year management contracts, along with effluents from third parties. VE also reached a partnership agreement with the Montedison group for a three year exclusive right between Veolia Water and the four companies (Cereol, Cerestar, Provimi and Beghin Say) resulting from the 2001 Eridania Beghin Say contract, covering the outsourcing of water management at over 50 industrial sites throughout Europe. VE believes that the industrial water outsourcing service market in Italy is worth EUR300million.

In the Czech Republic, a EUR20million 10 year contract with Spolchemi involving the design, construction and operation of an effluent treatment plant was signed in 2001. In 2002, a EUR5million, 10 year water and wastewater services contract was signed with Cutisin's Jilemnica, a subsidiary. In September 2003, Veolia Water gained an industrial services contract with Synthesia, a member of the Unipetrol Group covering the operation of Synthesia's wastewater treatment facility. The 200,000 PE plant also treats wastewater from the city of Pardubice (population of 100,000 in eastern Bohemia), where the company is located. The 10 year contract will generate revenues of EUR90million.

Other contracts in the Czech Republic include: Glaverbel Czech (producer of flat glass-process water supply); Termo Decin (operation of water management facilities); Cutisin (producer of food packaging-wastewater and process and drinking water); ICN Czech Republic (pharmaceutical-operation of an industrial and municipal WWTP complex); Eastman Sokolov (producer of commodity products-wastewater and drinking water); Keramika Horni Briza (ceramic tiles-wastewater treatment plant);

Intersnack (Ceske Budejovice); Airport Line; Hennlich (Usti nad Labem); Marius Pedersen (Plzen); Rudolf Jelinek (Zlin) and Setuza (Olomouc).

Veolia Water signed a contract in Hungary with Hajdú-Bét, a major poultry slaughterhouse located in Debrecen, in the east of the country. The 3 year contract covers the operation of a wastewater pre-treatment plant and will generate revenues of EUR1million.

Other contracts gained in 2003 included Johnson Matthey (United Kingdom) MD Papier GmbH & Co. (Germany), and Grande Paroisse S.A. (France, a subsidiary of the Atofina Group). Total revenues for these contracts will be EUR57million. A EUR78million 10 year contract signed with Corus Packaging Plus in Trostre (Wales, UK) in 2004 concentrates on effluent treatment services.

### **Outsourcing in Asia & Oceania**

#### **Australia**

In September 2008 Veolia Water and AquaNet Sydney Pty Ltd (part of the Jemena Ltd group) signed a contract with the Sydney Water Corporation for the first private scheme provide recycled water to industrial users in New South Wales. This will ease demand on Rosehill and Camellia's drinking water supplies, in western Sydney by providing 4.3billion litres pa of water for major industrial customers, with a future capacity for a further 3billion litres of water per year if needed. The BOOT contract will generate revenues of EUR122million over 20 years with a EUR30million 20,000m<sup>3</sup> per day water recycling facility being developed in 2009.

A EUR43million contract was signed in 2006 for taking over water treatment at the Bayswater Power Plant run by Macquarie Generation and serving Sydney and New South Wales. The project includes two years of design and construction works and 5 years of O&M.

#### **Malaysia**

In September 2002, VE signed a contract with Petronas for outsourcing services in water treatment and supply at the Kertih petrochemical complex in Malaysia. The 20 year contract does not involve any investment on the part of Veolia Water. The company will operate a potable water production plant with a capacity of 250,000m<sup>3</sup>/day and a distribution network serving customers such as BP Chemicals, Mitsui and Union Carbide, which work with Petronas in the petrochemical complex. The contract will generate revenues of EUR200million over its lifetime.

#### **Singapore**

VE signed a six year contract worth EUR53million for the construction and operation with Showa Denko, a subsidiary of the Japanese group Showa, for an ultra pure industrial water treatment unit in 2006.

#### **Korea**

The USD1billion Hyundai Petrochemical's Daesan contract (January 2000) runs for 20 years. The Hynix Semiconductors Corporation 12 year EUR900million contract for Hyundai of Korea is the largest industrial water outsourcing contract in the world to date. The contract calls for four ultra-pure water plants and two WWTWs. VE is acquiring the company's water and wastewater facilities for EUR196million and will generate EUR830million in revenues over the next 12 years. It was extended to 17 years in 2006 and in 2008, a new treatment plant entered service. A contract was gained in 2004 with the Kumho group for the maintenance and operation of water and wastewater facilities at Kumho Rubber Ulsan, and Kumho Petrochemical and Kumho Polychem (15 years, O&M) at the Yeosu National Industrial Complex.

In 2008, VE gained a EUR180million 15 year contract to construct and operate a water treatment plant serving Dongbu Steel in Asan Bay.

#### **Thailand**

Global Utilities Services Co. Ltd (Thailand) is a JV between Veolia S.Napa (49%), Industrial Estate Authority of Thailand (49%), and the IEAT Provident Fund (2%). GUSCO currently has 8 industrial water management contracts in Thailand, including Sony, Egco, GM and Ford, with a THB900million (USD21.2million) turnover or USD2.65million pa per contract.

In May 2007, a 15 year DBO contract was signed with PTTPE, worth EUR75million for the construction and operation of a water treatment plant.

### China

In January 2006, a 25 year industrial wastewater management contract was agreed with Sinopec at Beijing Yansan PetroChemical's Yanshan facility, 50km south west of Beijing. The EUR249million contract involves running four wastewater treatment plants with a total capacity of 129,000m<sup>3</sup>/day including the recovery of 40,000m<sup>3</sup>/day of process water.

Two water contracts were gained in 2007; Tianjin Soda (construction and operation, 27 years, worth EUR492million) and Qingdao Soda (operation of a water demineralisation facility for 25 years, generating EUR33million).

### Multiservice contracts

VE has 15 multi service contracts, which in 2008 generated revenues of EUR480million and have a combined backlog of EUR3.3billion. A EUR60million 10 year contract was gained in March 2004 by VE's Globalis GmbH for environmental services at Visteon's German site in Duren. This was the first multi service contract awarded in Germany. In April 2005, PSA Peugeot Citroën outsourced the environmental management activities of its new factory in Trnava, Slovakia to VE. The eight year contract will generate revenues of EUR60million.

Three major contracts were gained in 2008, all of which involved water and wastewater services. Artenius (Sines, Portugal) includes for water supply and effluent treatment (15 years, EUR730million), General Motors (Luton, UK) includes water supply (5 years, EUR17million) and Diageo (Elgin and Cameron Bridge, UK) includes effluent management (15 years, EUR210million).

### Contact Details

Name: Veolia Environment SA  
Address: 42 Avenue de Friedland, 75008 Paris, France  
Tel: +33 1 71 71 10 00  
Fax: +33 1 71 71 11 79  
Web: [www.veoliaenvironnement.com](http://www.veoliaenvironnement.com)  
[www.veoliawater.com](http://www.veoliawater.com)  
[www.generale-des-eaux.com](http://www.generale-des-eaux.com)

Henri Proglia (Chairman)  
Antoine Frerot (CEO)  
Pierre-Francois Riolacci (CFO)  
Jean-Michel Herrewyn (CEO, Veolia Water)  
Paul-Louis Girardot (Director, Generale des Eaux)

## RWE AG

RWE is the largest of the German multi-utilities. In the late 1980s, the company began to develop RWE Umwelt AG into one of Europe's largest waste management companies. In the mid 1990s, the company set up RWE Aqua as a subsidiary of Umwelt, to exploit the opening up of the water and wastewater markets in Germany and in central and Eastern Europe.

### RWE – Water acquisitions 2000-03

Company	Year	Revenues EURmillion	Stake (%)	Equity value EURmillion
Thames Water plc, UK	2000	2,247.00	100.00	7,100.00
ESSBIO, Chile	2000	46.00	51.00	340.00
E'town Corporation Inc., USA	2000	190.00	100.00	670.00
ANSM, Chile	2001	22.00	N/A	N/A
ESSEL, Chile	2002	20.00	25.50	150.00
Ondagua & Pridesa, Spain	2002	148.00	75.00	95.00
China Water Company, China	2002	[1] 9.70	48.80	N/A
RWW, Germany	2002	97.00	14.30 to 74.90	194.00
RWW, Germany	2002	97.00	74.90 to 79.80	N/A
American Water Inc., USA	2003	1,700.00	100.00	4,500.00

[1] Six months to 31-10-2001

RWE sought to become the third largest European water company by 2005 and achieved this by 2000 through its agreed bid for Thames Water. As a result of the September 2001 bid for American Water Works, RWE is now the third largest water utility company globally and the market leader in Germany, the UK and the USA. In 2005, RWE completed the divestment of RWE Umwelt and decided to sell its activities outside Germany and Central & Eastern Europe.

### A move away from water...

In 2004, RWE decided to concentrate on its European and American activities and is considering the fate of its other contracts on the basis of a "managed exit from all non-core markets". After a series of differing announcements on its Chilean and Spanish operations during 2005, the company formally announced in 2005 that it would divest its Thames Water and American Water Works holdings, along with its water activities outside continental Europe. In December 2006, Thames Water was sold to Kemble Water, a special purpose vehicle organised by the Macquarie European Infrastructure Fund for GBP4.8billion plus GBP3.2billion in assumed debt. The total value of the divestment of EUR11.9billion resulted in a book gain of EUR0.7billion for RWE. AWW was sold off in November 2009 after three placings following its April 2008 IPO.

### ...save for a safe European home

For the time being, RWE is retaining BWB and its other German activities, along with those directly held by the company in Central & Eastern Europe. This covers approximately 15million people, often within multi-utility contracts.

### Divestment programme:

Pridessa/Ondagua	Spain	Sold to Acciona (EUR150million)
Thai Tap Water	Thailand	Sold to CH Karnchang, its JV partner
Ajman	UAE	Sold to Veolia
Berlinwasser International	Global	Sold to Marubeni, but bid was rescinded in 2006
China Water Company	China	48% stake sold to Biwater in 2007
United Water	Australia	47.5% stake sold to Veolia, its JV partner
ESSAM/ESSBIO/ESSEL	Chile	Sold to Southern Cross (USD300million)
Thames Water	England	Sold to Macquarie in 2006
American Water Works	USA	IPO, May 2008, stake sale completed in 2009

**RWE AG, profit and loss account**

<b>Y/E 30/06 (EURmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	39,487	42,554	42,507	48,950	47,741
Pre-tax profit	3,156	3,537	5,246	4,866	5,598
Net profit	2,231	3,847	2,667	2,558	3,571
Earnings/share (EUR)	3.97	6.84	4.74	4.75	6.70

In 2007, all water activities were classified as discontinued operations. No separate information is provided about RWE's water activities.

**RWE, breakdown of populations served**

<b>Country</b>	<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Germany	11,500,000	6,200,000	13,200,000
Hungary	1,500,000	50,000	1,550,000
Croatia	0	750,000	750,000
Poland	135,000	135,000	135,000
Azerbaijan	50,000	0	50,000
Mauritius	0	200,000	200,000
Namibia	0	80,000	80,000
China	0	2,300,000	2,300,000
<b>Total - home markets</b>	<b>11,500,000</b>	<b>6,200,000</b>	<b>13,200,000</b>
<b>Total – international</b>	<b>1,685,000</b>	<b>3,315,000</b>	<b>5,065,000</b>
<b>Grand total</b>	<b>13,185,000</b>	<b>9,515,000</b>	<b>18,265,000</b>

**Germany**

RWE Aqua is responsible for the water business of RWE in Germany, Hungary and Poland and the international activities managed by Berlinwasser. In 2000, it was split from RWE Umwelt and merged with Thames Water, then in 2003 it was merged with the rest of RWE Energy. RWE Aqua gained the Budapest water concession in 1997 and acquired 22.5% of Berlin Water in 1999. Budapest was held jointly with Suez and the latter jointly with VE. RWE Aqua had a total turnover of EUR808million in 2000 due to the Berlin Water acquisition.

Stakes held by RWE Aqua account for 13.2million people in ten German states. Berlin and Essen and has stakes in the following entities: Hastrabau (Langenhagen), SEG (Schwerte), Ruhrwasser (Essen), WVN (Essen), MKW (Frankfurt), WRH (Ludwigschafen), envia aqua (Chemnitz) and W&A Holzland (Hermsdorf), DAR (Aachen, Trier, Weisbaden, Mannheim and Berlin) and ARGE (KRW (Neuweid), KAWAG (Ludwigsburg) and LEW (Augsburg).

RWE Aqua acquired the majority stake in RWW (Rheinisch-Westfälische Wasserwerks-gesellschaft GmbH) in Mülheim an der Ruhr in April 2002. RWE was one of the founding members of RWW in 1912 with a 14.3% stake, which was increased to 74.9% in 2002. It was agreed with the municipal shareholders to keep the current water tariff stable until 2005. RWW has responsibility within RWE Aqua for North Rhine Westfalia, Rhineland Palatinate, Belgium, the Netherlands and Luxembourg. In September 2002 RWE Aqua acquired an additional 4.8% in RWW. RWW serves 1million people and had a turnover of EUR77million in 2001. The stakes cost a combined EUR233million.

**International contracts directly held by RWE****Croatia**

2000	Zagreb	26 year BOT	0.75million sewage treatment
------	--------	-------------	------------------------------

This is the largest sewage treatment concession award in central and Eastern Europe to date, involving EUR270million in capital spending. The project scope includes design, construction and operation of the wastewater treatment plant (1million PE) and the administration facilities, construction of the main collecting pipeline (9.8 km) and coverage of main drainage canal (5.5km). The concession company, Zagrebacke otpadne vode d.o.o (ZOV), is formed by RWE Aqua (48.5%), WTE Wassertechnik GmbH (48.5%, see EVN, Austria) and the City of Zagreb (3%). Construction began in July 2002 and was completed between 2004 (mechanical treatment) and 2006 (biological treatment).

### Poland

2002	Gornicza	25 year concession	135,000 water & sewerage
------	----------	--------------------	--------------------------

RWE acquired a 34% stake in PwiK, the municipal supplier for Dabrowa Gornicza in Silesia. The contract runs for 25 years. The partnership between RWE Aqua and the city of Dabrowa Gornicza is the first project for RWE Aqua in Central & Eastern Europe and at the time also only the third privatisation project in the Polish water market. Sewage treatment coverage will be extended from 30% to 100%.

### Berliner Wasserbetriebe

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Domestic revenues	N/A	1,123	1,117	1,172	1,183
International revenues	N/A	19	17	19	7
Services revenues	N/A	5	5	5	6
<b>Total turnover</b>	<b>1,234</b>	<b>1,147</b>	<b>1,139</b>	<b>1,193</b>	<b>1,197</b>
Net profit	85	89	150	136	158
Water sales in Germany (million m <sup>3</sup> )	197	202	200	193	192
Sewage treated in Germany (m m <sup>3</sup> )	227	224	233	228	227
Water sales - BWI (million m <sup>3</sup> )	N/A	N/A	87	N/A	N/A
Sewage treated - BWI (million m <sup>3</sup> )	N/A	N/A	415	N/A	N/A

BWB dates back to 1856, including 45 years with its services being divided by the Berlin Wall. In 1999, after the partial privatisation of BWB, Berlinwasser Holding AG was formed and BWB was vested into this company. The consortium (VE 50.1% and RWE 49.9%) acquired 49.9% of BWB for EUR1.69billion, with the majority 50.1% stake being held by the City of Berlin.

1999	Berlin	30 year concession	4.0million water and sewerage
------	--------	--------------------	-------------------------------

BWB serves 3.5million people in Berlin, operating nine water treatment works and six sewage treatment works. In addition water is provided to 90,000 people and wastewater treatment to 0.5million in Brandenburg via 10 water and 24 wastewater contracts with a total of 113 local authorities. Leakage in 2008 was 2.9%.

### Berlinwasser International

Berlinwasser International AG (BWB) was set up by Berlinwasser in 1994 and therefore predates the concession award to RWE and Veolia in 1999. BWB gained its first contracts in 1997-98 and currently has nine projects in five countries with a total order backlog worth EUR495million in 2003.

In the Middle East, a joint venture between BWI (40%) and Metito (60%) of the UAE was signed in 2008. The JV will address potential projects in the MENA region. Metito Berlinwasser Ltd aims to manage capital spending of USD1billion between 2009 and 2012.

### Hungary

1997	Budapest	25 year concession	1.9million, sewerage
------	----------	--------------------	----------------------



The management company formed by VE (35%), BWI (35%) and EBRD (30%) took a 25.1% stake in Fővarosi Csatornászási Művek Rt., Budapest's wastewater company. BWI and VE now have a 50% holding each in Fővarosi Csatornászási Művek Rt. Secondary treatment capacity has increased from 220,000m<sup>3</sup>/day in 2000 to 280,000m<sup>3</sup>/day in 2004 (76% being used), with the number of customer connections rising from 137,813 to 162,753. The total investment was EUR76million, EUR34.7million from BWI.

1997	Budapest	25 year O&M	1.5million water distribution
------	----------	-------------	-------------------------------

Suez and RWE Aqua control all the shares of the management company and 25% of the equity of the asset management company. The management company formed by Suez (51%) and RWE Aqua (49%) took a 25% stake in Fővarosi Vizmuvek for USD82million. RWE holds 13% of the asset company. FV has a USD80million turnover and employs 1,500 staff. RWE subsequently transferred its shareholding into BWI.

1997	Hodmészövásárhely	25 year concession	50,000, sewerage
------	-------------------	--------------------	------------------

Zsigmondy Bela Rt. Manages the concession agreement with the city of Hodmészövásárhely. A wastewater treatment plant with a capacity of 30,000m<sup>3</sup> per day has been upgraded to comply with the UWWTD.

### Azerbaijan

2002	Imishli	10 year O&M	50,000, water
------	---------	-------------	---------------

BWI is responsible for the management of the city's water services and owns 75% of the operating contract. The well network was rehabilitated in 2001 prior to the contract's commencement. Water provision improved from 2 hours per day to 15 hours per day by 2003. In 2003, 57% of tariffs were collected, rising to 75% by 2005.

### China

Activities in China were grouped into Berlinwasser China Holdings in 2008. The 1997 20 year BOT for waterworks serving Xian was sold in 2003 after legislative change prevented the fixed rate of returns in contracts run by international companies. BWI's 35% stake in Waterworks Xian South Co., Ltd, to the majority shareholder, the water enterprise of Xian, China for USD11.2million.

2004	Hefei	23 year TOT	1.1million, sewerage
------	-------	-------------	----------------------

The WangXiaoYing 310,000m<sup>3</sup> per day facility was built by the municipality between 1998 and 2002 and BWI took over its operation in December 2004. Hefei Wang Xiao Ying Sewage Treatment Co., Ltd. is 80% held by BWI and 20% by East China Engineering Science & Technology Co. Ltd in a CNY491million contract. BWI invested EUR13.2million in the project and the contract generated a net profit of EUR1.6million in 2007.

2003	Nanchang	20 year BOT	1.2million, sewerage
------	----------	-------------	----------------------

The 330,000m<sup>3</sup> per day facility entered service in October 2004, built at a cost of EUR30million and handles a third of the city's sewage. Nanchang QingShanHu Project Co. Ltd. is 80% held by BWI and 20% by Third Construction & Engineering Co. Ltd. BWI invested EUR7.9million in the project out of a total of EUR30million and the contract generated a net profit of EUR1.6million in 2007.

### Namibia

2002	Windhoek	20 year O&M	80,000, sewerage
------	----------	-------------	------------------

The contract (34% BWI, 34% Veolia & 33% VA Tech) covers a water reclamation facility at the city's sewage treatment plant and provides 21,000m<sup>3</sup> of water per day, a third of the domestic water supplies for the city of 250,000. The turnover of Wingoc is approximately EUR2million pa. In addition, BWI has a five year O&M contract for the city of Swakopmund's sewage treatment works, which have a capacity of 10,000m<sup>3</sup> per day.

### Mauritius

2008	St Martin	7 year O&M	200,000, sewerage
------	-----------	------------	-------------------

The contract is 100% held by BWI and covers the management of a 70,000m<sup>3</sup> per day wastewater facility. BWI is working with the locally based Onsiang Bros & Co on the project.

### Albania

2003-08	Four Albanian towns	5 year O&M	450,000 water & wastewater
---------	---------------------	------------	----------------------------

BWI gained a five year EUR4million contract to take over management of water supply and wastewater disposal in the Albanian towns of Durres, Fier, Lezhe and Saranda. The project is supported by EUR22million in funding from the World Bank and was implemented by a JV between BWI (60%) and Aquamundo (40%). Average water supply across the towns rose from four to nine hours a day and the number supplied rose from 450,000 to 650,000.

The contract was concluded in September 2008.

BWI sold its 97.5% shareholding in the Elsaban concession, serving 80,000 people in 2006.

### Contact Details

Name: RWE AG  
 Address: Opernplatz 1, D-45128 Essen, Germany  
 Tel: +49 201 12 00  
 Web: [www.rwe.com](http://www.rwe.com)  
[www.berlinwasser.de](http://www.berlinwasser.de)  
[www.berlinwasser.com](http://www.berlinwasser.com)

Dr. Jürgen Großmann (President and CEO)  
 Dr. Rolf Pohlig (CFO)

**ACEA (AZIENDA COMUNALE ENERGIA e AMBIENTE SPA)**

Azienda Comunale Energia e Ambiente (ACEA), the municipality serving electricity and water services to the city of Rome, was partially floated in February 1999. 51% of the equity is held by the municipality of Rome, 8.9% by Suez Environnement and the rest by a variety of private and institutional investors. A further share sale by the municipality may be considered. The company was founded in 1909 for electricity distribution, started water provision services as AGEA in 1937 and was renamed ACEA in 1945. ACEA is Italy's largest water and electricity utility. The company believes that it provides the best quality drinking water in Italy at one of the lowest prices for a major city in Europe. In August 2007, merger talks began between ACEA and Iride, the utility which merged with AMGA in 2006, but these have not made significant subsequent progress.

**ACEA, profit and loss account**

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Rome-Water billed (million m <sup>3</sup> )	438	442	447	455	456
Other ATOs-Water billed (million m <sup>3</sup> )	N/A	226	272	312	314
Wastewater billed (million m <sup>3</sup> )	473	485	476	494	527
Turnover	1,624.4	2,187.3	2,583.9	3,144.0	2,954.3
Water EBITDA	170.6	206.7	212.8	258.1	251.5
Operating profit	232.6	290.5	293.4	385.0	185.9
Net profit	127.9	147.4	164.0	186.3	-52.5
Earnings/share (EUR)	0.60	0.69	0.77	0.87	-0.13

The 2010-12 business plan anticipates capital spending of EUR579million in the water activities with the aim of expanding its population served in Italy from 8.3million (14.7% market share) to 8.7million (15.2% market share), with water delivered rising from 767million m<sup>3</sup> in 2008 to 832million m<sup>3</sup> by 2010, with the growth mainly taking place outside Rome.

**ACEA – people served**

Country	Water	Sewerage	Total
Italy	8,542,000	9,750,000	9,750,000
Peru	800,000	0	800,000
Honduras	495,000	495,000	495,000
Columbia	3,900,000	0	3,900,000
<b>Total - home markets</b>	<b>8,542,000</b>	<b>9,750,000</b>	<b>9,750,000</b>
<b>Total – international</b>	<b>5,195,000</b>	<b>495,000</b>	<b>5,195,000</b>
<b>Grand total</b>	<b>13,737,000</b>	<b>10,245,000</b>	<b>14,945,000</b>

**Italy**

Through a series of contract gains for ATOs, ACEA is now the leading water and wastewater company in Italy. Current year targets for building upon ACEA's presence in western Italy are ATO1 (Lucca), ATO2 (Perugia) and ATO3 (Rieti). ACEA is seeking to merge the Florence, Pisa and Siena-Grosseto ATOs into a single entity serving 3.3million people in Tuscany. In total, 8.542million people are currently served through seven ATOs, representing a 630,000 increase on the 2008 coverage.

**ACEA: ATO activities in Italy, 2009**

ATO	Company name	Stake	City	People served	Communes
ATO 1	Acea ATO2	96%	Lazio-Centrale	3,700,000	112
ATO 5	Acea ATO5	94%	Frostione	480,000	86
ATO 6	Acquedotto del Fiora	80%	Siena-Grosetto	379,000	56
ATO 2	Acque	45%	Pisa	763,000	57
ATO 3	Publiacqua	85%	Firenze	1,260,000	49
ATO 3	Gori Acqua	96%	Sarnese Vesuviano	1,500,000	76

ATO	Company name	Stake	City	People served	Communes
ATO 1	Umbra Acque	40%	Umbria	460,000	38

In the medium term, ACEA aims to gain contracts for a further 1.3million people via the ATO process and to gain some 17% of the Italian water and sewerage market (9.8million people, excluding CREA/Sigesa) by 2012, with total water delivered rising from 655million m<sup>3</sup> in 2006 to 979million m<sup>3</sup> in 2012. The corporate business plan is based on gaining additional ATOs in western Italy and becoming the dominant regional player.

### Rome

In 1999, 2.8million people were served with water services and 2.2million with sewerage services. This currently stands at 3.37million people through ACEA ATO 2, a 30 year concession between ACEA (96%) and 111 councils (4%) in the ATO2 Lazio region that started in January 2003 and a series of additional contracts.

Y/E 31/12 (EURmillion)	2004	2005
Water provision	22.85	23.52
Sewerage	33.77	33.41
Water maintenance services	1.29	1.23
Monumental fountains service	1.59	1.59
Urban water services	7.24	6.21
Concession fee	17.20	17.87

Expansion has been achieved through taking on services for neighbouring municipalities:

**2003:** Starting with the municipalities of Rome, Monterotondo, Tivoli, Guidonia-Montecelio, Grottaferrata, Ciampino and Fiumicino, the Simbrivio Consortium, was taken over, a system that supplies water on a wholesale basis to 45 municipalities and 2 consortia.

**2004:** The municipalities of Castel Madama, Mentana, Fonte Nuova, Marcellina, San Gregorio da Sassola, Ciciliano, Pisoniano, Rocca Santo Stefano, Montelanico and Albano Laziale, along with a wholesale water system from a consortium set up by the former Southern Italy Development Fund and previously managed by Lazio Regional Authority, which services Pomezia, Ardea and Lanuvio.

**2005:** The municipalities of Casape, Carpineto Romano, Sambuci, Affile, Arcinazzo Romano (excluding the CO.RE.CALT. Consortium) Gavignano, Gorga, Cervara di Roma, Subiaco, Castel Gandolfo, Vicovaro, Artena, Trevignano Romano and Santa Marinella.

**2006:** Doganella Consortium's aqueduct system serving the municipalities of Palestrina, Zagarolo, Colonna and San Cesareo and the system serving the municipalities of Bellegra, Roiate, San Vito Romano, Castel San Pietro Romano and Galliciano. Waste water and sewerage services in the municipalities of Capranica Prenestina and Olevano Romano, where drinking water services are managed by another operator. Water services in the municipalities of Poli, Genazzano and Rocca di Cave from March 2007. Services in the municipalities of Fiano Romano, Jenne, Nemi (drinking water services only), Vejano, Segni, Saracinesco, Lariano, Lanuvio, Sacrofano, Tolfa, Allumiere, Pomezia (provisional management of sewerage and water treatment services), Sant'Oreste, Nazzano and Castelnuovo di Porto.

**2007:** Rocca di Cave, Poli and Genazzano (water, having already held their wastewater contracts) and Torrita Tiberina, Riano, Marino, Oriolo Romano and Ponzano Romano (water and wastewater).

**2008:** A water and wastewater contract for Cerveteri became operational in February 2008. Other municipal contracts gained were for San Polo dei Cavalieri, Trevi nel Lazio, Pugilo and Alti-piani di Arcinazzo.

**2009:** The Acquedotto del Peschiera Consortium was signed up with agreements from six of the municipalities (Torrita Tiberina, Nazzano, Filacciano, Ponzano Romano, Fiano Romano and San'Oreste) with two further municipalities (Cibvitella san Paulo and Capena) pending. Integrated water services for Foemello were also signed up.

To date, 81 municipalities have opted for ACEA's services in the region, accounting for 94% of the addressable population, or 3.7million people. ACEA has noted that the pace of acquisitions has slowed since 2007.

### Subsequent ATO awards

2003	Frosinone	ATO privatisation	480,000 water & wastewater
------	-----------	-------------------	----------------------------

In April 2002, a consortium led by ACEA gained a 30 year concession for the Frosinone ATO 5. ACEA holds 65% of the consortium, with CREA being one of the secondary investors. The concession covers 460,000 people (188,000 customers). EUR361.5million will need to be invested during the concession's life. The concession entered into service in October 2003 and covers 86 municipalities. Water coverage is 97% and sewerage coverage is 57%.

Three ATOs were gained in Tuscany by a consortium led by ACEA and also featuring Ondeo. With ACEA and Ondeo controlling services for 2.7million out of the 3.5million people living in Tuscany, a rationalisation of these concessions is planned.

During 2009, ACEA plans to acquire the concessions for the municipalities of Formello, Morlupo, Trevi nel Lazio (sewerage and water treatment alone) and Sant'Angelo Romano, following on the acquisition of the Co.R.Ec.Alt. Consortium, the Acquedotto del Peschiera Consortium and the municipalities of Valmontone and Vallepietra in 2008. These did not progress during the year.

2002	Pisa	ATO privatisation	763,000 water & wastewater
------	------	-------------------	----------------------------

A 45% stake in Acque SpA (AI) was acquired for EUR19.2million. AI is Tuscany's ATO-2 Basso Valdarno, serving 57 communes. The 20 year concession will generate EUR1.2billion in revenues.

2003	Siena/Grosetto	ATO privatisation	379,000 water & wastewater
------	----------------	-------------------	----------------------------

A 40% equity stake in the Acquedotto de Fiora was acquired by the ACEA led consortium for EUR19.3million, with a concession life of 25 years. ATO-6 Ombrone covers 56 communes and required some EUR433million in capital spending.

2003	Florence	ATO privatisation	1,260,000 water & wastewater
------	----------	-------------------	------------------------------

The ACEA led consortium has acquired 40% of Publiacqua SpA, the holder of the 20 year concession to operate water and wastewater services for 50 communes in Tuscany's ATO-3 Medio Valdarno. Publiacqua had a turnover of EUR104million in 2002 and net profits of EUR8million. The consortium is contributing EUR60million towards the EUR150million capital increase, with the municipalities paying the remaining EUR90million. In conjunction with the privatisation, EUR300million of Publiacqua's revenues were securitised in order to pay for the capital increase and to retire mature debt. ACEA is currently in talks to acquire 40% of ASA SpA, Tuscany's ATO-5 Toscana Costa-Livorno. ASA provides water to 359,000 in the Livorno municipality.

2005	Sarnese Vesuviano	ATO privatisation	1,200,000 water & wastewater
------	-------------------	-------------------	------------------------------

A 30 year concession awarded to Campania-Gori SpA, serving part of Naples. This was expanded from 700,000 people to 1,500,000 in the following three years.

### Acquisition of SIGESA

ACEA acquired SIGESA (Società Italiana Gestione Servizio Ambientale) for EUR21.4million in June 2005 and the acquisition was consolidated on 1<sup>st</sup> January 2006. SIGESA was founded by Bouygues/SAUR in 1986 and acquired the water services activities of Fiat SpA in 1998 along with 71% of Crea in February 2000 (the remaining 29% being held by Italmobiliare SpA). The acquisition valued Crea at EUR67million. Crea supplies water to 13 regions. In 2003, SAUR acquired 26.5% of Umbria Acque the ATO serving 460,000 people in the city of Perugia. Other activities are in Lucca, Rieti and Benevento.

Population served (million)	Sigesa	Crea	Combined
Water	0.35	0.85	1.20
Wastewater	0.45	1.85	2.40

Turnover increased from EUR21million in 1999 to EUR48million in 2000 and EUR58million in 2001. Consolidated revenues were EUR30.7million in 2004 after the divestment of the gas activities. ACEA acquired SIGESA for EUR19million in July 2005, a purchase price of EUR2million and the assumption of EUR17million in liabilities.

### Sale of Acqua Italia to Amga

In November 1999, ACEA set up Aqua Italia SpA (AI), a 67:33 venture with Impreglio SpA. In 2000, AI acquired majority stakes in Acquedotto de Ferrari Galliera (ADF, 67%) and Acquedotto Nicolay (AN, 53%), two of the three listed water companies in Italy prior to the emergence of the municipal multi-utilities. Both companies serve the city of Genoa (see their respective company entries). ACEA has also acquired 3.7% of Amga's (see relevant company entry) equity. All three companies provide water services to the city of Genoa. In July 2005, ACEA sold its stake in Acqua Italia to Amga SpA for EUR61million and the assumption of EUR10million in debt. Acqua Italia has revenues of EUR20million in 2004, and a net income of EUR3million.

### International activities

In July 2004, ACEA announced that while it would retain its existing water activities, it would not be seeking new international contracts. ACEA's Yerevan contract was completed in 2005 and VE gained a subsequent contract serving that city. ACEA's international activities had revenues of EUR15.8million in 2005 (2004; EUR12.9million) and an operating profit of EUR3.1million (2004; EUR2.2million).

### Albania

2001	Tirana Acque	4 year management	650,000 water
------	--------------	-------------------	---------------

ACEA holds 40% of Tirana Acque, an Italian consortium developed to take advantage of bilateral agreements between Italy and Albania. The contract is worth EUR10.5million. The longer-term aim was to be involved in the privatisation of Greater Tirana Water Supply and Sewerage, but this has not gone ahead and the original contract has been completed.

### Honduras

2000	San Pedro	30 year concession	495,000 water & sewerage
------	-----------	--------------------	--------------------------

The concession was awarded to Aguas de San Pedro in August 2000 and entered service in February 2001, with ACEA holding 31% of the consortium's equity. Service targets are for 100% water coverage in three years and 100% sewerage coverage within five. USD135million of investment is planned during the life of the concession.

### Peru

2000	Cono Norte	27 year concession	800,000 water
------	------------	--------------------	---------------

ACEA (Consortio Agua Azul SA, 45%) teamed with Impregilo SpA (40%), Fisia Utalimianti SpA (5%) and Castalia & Cosapi SA (10%) of Peru for the Cono Norte concession that was awarded to Agua Azul SA in January 2000. After two years constructing a new water treatment works for USD50million, the operating contract runs for 25 years. Cono Norte is part of the city of Rio Chillón. Its population is currently 750,000 but is expected to rise to 2,000,000 by the end of the concession. The concession involves the supply of 44million m<sup>3</sup> of water pa at PEN2.8million/month (USD0.8million) and involves USD80million in capital spending.

**Colombia**

Operations are carried out through ACEA's 51% held Aguazul Bogota. It is understood that both contracts have been renewed as of 2009.

2003	Bogota	5 year O&M	2,500,000 water
------	--------	------------	-----------------

The contract is with the municipality's Empresa de Acueducto y Alcantarillado de Bogotá (EAAB) and covers 45% of the city's population, based in zones 2 and 5. The contract has an annual turnover of USD10million.

2003	Santo Domingo	4 year O&M	1,400,000 water
------	---------------	------------	-----------------

The contract is with the municipality's CAASD. It will run for a minimum of 4 years and is renewable.

**Contact Details**

Name: ACEA SpA  
 Address: Piazzale Ostiense 2, 00154 Rome, Italy.  
 Tel: +390 6 57 991  
 Fax: +390 6 57 994 146  
 Web: www.aceaspa.it

Giancarlo Cremonesi (Chairman)  
 Marco Staderini (CEO)  
 Paolo Bassi (CFO)

## AGUAS DE BARCELONA SA

Sociedad General de Aguas de Barcelona SA (Agbar) is under the indirect control of Suez. In 2007, Suez, La Caixa, and HISUSA (51% Suez Environment, 49% Caixa Holding), which jointly owned 49.7% of Agbar, launched a public tender offer for Agbar's outstanding shares. As of July 2008, Suez held 12% of Agbar directly and HISUSA held a further 64%, with Suez Environnement holding 45.9% of Agbar's shares. In 2010 Suez Environnement launched an agreed takeover of Agbar and the share is to be delisted. It is assumed that this will be the final company entry for Agbar as a separate entity.

Agbar dates back to the Compagnie des Eaux de Barcelone founded in 1867 and incorporated in Paris as La Soci t  G n rale des Eaux de Barcelone, in 1881, before being acquired by Catalan investors and incorporated in its current form in Barcelona in 1919 for the provision of water and sewerage services in Barcelona. Until 1985, Agbar along with FCC enjoyed an effective duopoly of Spanish private sector water and sewerage contracts across Spain. Since then, several Spanish construction companies and electricity utilities have entered the market, and in several cases have subsequently sold these activities.

In June 2006, Agbar acquired Bristol Water, the largest independent Statutory Water Company in England and Wales for EUR256.8million.

### Agbar, profit and loss account

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Water turnover	1,204	1,427	1,627	1,771	1,734
Group turnover	2,749	2,579	2,861	3,108	1,734
Water operating profits	184	250	265	N/A	348
Group operating profits	303	330	371	439	348
Water net profit	185	N/A	N/A	N/A	N/A
Net profit	338	308	483	360	325
Minority interests	-86	141	131	125	158
Group net profit	252	167	353	235	167
Earnings/share (EUR)	1.70	1.12	2.36	1.57	1.11

2006 and subsequent results reflect the disposal of Applus and the 2009 results reflect the sale of the healthcare division. All revenues in 2009 are from water and wastewater activities.

### Agbar, services in 2008

Water	Spain	International
Municipalities served	1,205	75
Population served	12,658,013	11,590,476
Customers served	6,239,372	2,823,164
Water treatment plants	204	36
Water delivered (million m <sup>3</sup> pa)	1,315	1,273
Treatment capacity (m <sup>3</sup> /day)	2,477,691	3,285,216
<b>Sewerage</b>		
Municipalities served	381	62
Population served	8,377,872	8,746,233
Sewer systems (km)	20,645	14,003
<b>Sewage treatment</b>		
Municipalities served	442	64
Population served	9,180,306	3,772,441
Capacity (m <sup>3</sup> /day)	2,626,473	1,218,577

In 1Q 2009, 163.19million m<sup>3</sup> of water was supplied in Spain (47.1% of the Group total) against 183.25million m<sup>3</sup> internationally. International sales were to the UK (6.0% of Group total), China (6.2%) and Chile (40.7%).



**Agbar, services in 2007**

<b>Water</b>	<b>Spain</b>	<b>International</b>
Municipalities served	1,205	68
Population served	12,171,598	9,009,367
Customers served	6,089,018	3,218,328
Water treatment plants	223	38
Water delivered (million m <sup>3</sup> pa)	1,319	1,332
Treatment capacity (m <sup>3</sup> /day)	2,496,143	3,285,216
<b>Sewerage</b>		
Municipalities served	381	64
Population served	8,377,872	8,887,124
Sewer systems (km)	20,645	13,960
<b>Sewage treatment</b>		
Municipalities served	498	62
Population served	10,168,063	3,403,932
Capacity (m <sup>3</sup> /day)	2,495,853	1,215,094

Operating margins have consistently been higher than for the company's other activities, with an internal rate of return of 15% for most recent contracts. Agbar expects to devote 65% of its capital expenditure on water and sewerage services in the medium term.

**Spain**

Excepting Barcelona, Agbar's water and sewerage contracts in Spain have an operating life ranging from 5 to 30 years. The company provides sewerage services for 8million people and 10million have their sewage treated. Agbar holds 52% of the private sector's share of the water provision market in Spain. Currently municipalities hold 48% of the market, which is being steadily eroded by privatisations. Agbar serves 1,368,911 customers in the Barcelona metropolitan area, a total of 2.845million people. In 2006, the Alicante concession, serving 725,000 people, was extended from 2016 to 2036.

<b>New contracts, 2009</b>	<b>Contract value (EURmillion)</b>	<b>Contract duration (years)</b>
Puertollano (Ciudad Real)	322	50
Leon	176	25
Aviles (Asturias)	138	25
Martorell (Barcelona)	81	30
Benahavis (Malaga)	42	25
Coria (Caceres)	24	25
Villaquilambre	22	25
Marchena (Sevilla)	N/A	17
Madris WWTW (Canal Isabel II)	N/A	8 & 4

<b>Retained contracts, 2009</b>	<b>Contract value (EURmillion)</b>	<b>Contract duration (years)</b>
Torremolinos (Malaga)	259	25
Villajoyosa (Valencia)	94	25
Villaneuva de la Serena (Badajoz)	47	25
Olot (Girona)	34	20
San Clemente (Cuenca)	17	21
Algorfa (Alicante)	14	20
Banyeres (Valencia)	10	25
Ribera de Gata (Caceres)	N/A	10

26 new water contracts were gained in 2008, serving 128,172 people, along with 41 contracts (244,571 people) being renewed. Nine bulk water contracts were gained (31,960 people) and 16 renewed (132,747 people). 10 wastewater treatment contracts were gained (220,007 people), along with 19 sewerage contracts (201,630 people). Overall, the contract renewal rate in 2008 was 99%.

In 2009 Agbar gained 33 new water distribution contracts covering 485,107 people, along with 20 bulk water contracts for 559,241 people, 22 sewage treatment contracts covering 861,157 people and sewerage contracts covering 289,233 people. No information is available on contract retention.

Agbar has some 2,100 water, sewerage and sewage treatment contracts in Spain, ranging from serving 1,000 to 2.8million people. In 2007, 21 new water concessions were gained (44,000 people, including Santa Cruz de la Palma, in the Canary Islands for 17,640 inhabitants) and 59 contracts renewed (213,000 people, including Benidorm, in Alicante (67,500) and Ripollet, in Barcelona (34,700 inhabitants)). 23 sewerage contracts were renewed or gained, serving 159,000 people, including a new contract for Ciudad Real (71,005). 41 wastewater treatment plant management contracts were awarded, with a PE of 285,000, including a new contract for Xátiva, in Valencia (28,000 inhabitants) and the renewal of the contract for Mahón, in the Balearic Islands (27,000 inhabitants); and ten wastewater treatment plants currently managed by the Gran Canaria Island Council for 30,000 equivalent inhabitants.

### Acquisition of Ferrovial's water and wastewater activities

In July 2004, Ferrovial sold its water activities to Agbar for EUR43.3million. These consist of 14 concessions for water and wastewater services to 217,480 people in 32 municipalities, rising to 450,000 during the summer. Contracts for some 50,000 people were gained during 1998 and 1999 and for a further 150,000 during 2000. This business was mainly built up between 1998 and 2000 and consists of 130,000 customer accounts generating revenues of EUR16.3million in 2003. The main towns served with water or wastewater by Ferroser are: Ponferrada and San Andrés del Rabanedo (Castilla-León), Estepona, Ubeda and Vélez Blanco (Andalucía), Poio and O Barco de Valdeorras (Galicia), Plá de Mallorca (Balearic Islands), Guadalemar (Extremadura), and Castañeda and Cartes (Cantabria).

### Sale of Aguagest Sur

50% of Aguagest Sur was sold to Unicaja and Caja Granada in July 2005 for EUR73.5million. Agbar will retain the rest of the company's equity. Aguagest Sur was founded in 1991 and is responsible for water and sewerage services for 43 municipalities in Andalusia, serving 1,194,535 people.

### International activities

Until recently Agbar sought major contracts in Latin America in partnership with Suez but now Agbar operates on its own. Likewise, as demonstrated by the Bristol Water acquisition, the group is seeking opportunities in markets outside Latin America. Two small stakes in the USA (10% of Western Water) and Morocco (5% of Lydec) have been sold.

### Agbar, number of people supplied in Spain and internationally

Country	Water	Sewerage	Total
Spain	13,031,201	13,380,000	<b>15,000,000</b>
United Kingdom	1,136,445	0	1,136,445
Chile	6,978,881	6,120,503	6,978,881
Colombia	917,294	789,568	917,294
Cuba	1,272,414	1,239,855	1,272,414
Mexico	706,823	678,777	706,823
Algeria	1,443,000	1,200,000	1,443,000
China	588,000	1,500,000	2,088,000
<b>Total outside Spain</b>	<b>13,042,857</b>	<b>11,528,703</b>	<b>14,542,857</b>
<b>Global Total</b>	<b>26,074,058</b>	<b>24,908,703</b>	<b>29,542,857</b>

Since 2005, the company has reviewed its activities in Latin America and has withdrawn from Argentina, Uruguay and Brazil. The company remains committed to Chile and Cuba, but all other activities remain subject to review.

In 2010 the company won a three year management contract for Sedapal's commercial management activities serving the southern area of Lima. Sedapal serves a total of eight million people.

Distribution losses in Spain were 25% in 2008 (25% in 2007 and 24% in 2006) with distribution losses internationally level at 27% during this period. BOD reduction in Agbar's WWTWs in Spain was constant at 93% while rising to 96% (from 89% in 2006) internationally. 24% of wastewater in Spain was recovered in 2008 (13% in 2006) and all internationally (43% in 2006).

### United Kingdom – Bristol Water

The Bristol Waterworks Company (Bristol Water) was founded in 1846. Bristol Water supplies water to 1,092,000 people in the city of Bristol in western England and certain surrounding areas. Sewerage services are carried out by Wessex Water (YTL). Veolia Environnement's 24.7% holding was sold to the Ecofin Water & Power Opportunities Fund Plc in 2002 for GBP38million. In April 2001, Bristol Water and Wessex Water set up a JV to combine their customer services and billing operations. Bristol Water Plc is 100% held by Bristol Water Group Plc, the successor company to Bristol Water Holdings Plc set up in September 2003 which operates the company's non-regulated activities. By May 2005, all non regulated activities with the exception of some joint ventures had been divested.

### Bristol Water Group, profit and loss account

Y/E 31/03 (GBPmillion)	2006	2007	2008	2009	2010
Group turnover	81.9	86.3	91.0	96.7	99.7
Operating profit	24.9	25.2	26.3	29.1	27.9
Pre-tax profit	18.4	18.9	17.9	17.4	23.1
Post tax profit	11.6	16.4	14.5	12.1	18.6

In December 2003 Bristol Water announced a refinancing to increase in the level of borrowings in the regulated water business and a return of GBP51million to shareholders. A second round of refinancing was completed in June 2005, returning a further GBP30million. Agbar made a GBP175million agreed bid for Bristol Water in April 2006, which was declared unconditional in May 2006. Bristol Water was the only company to appeal against Ofwat's 2010-15 price limits. In August 2010, the Competition Commission announced that the company would be allowing to raise its bills by 17.1% above inflation during the 2010-15 period against the 9.1% set by Ofwat, allowing GBP9million in extra operating spending and GBP15million in extra capital spending.

### Argentina

Agba's has exited from its activities in Argentina.

Aguas de Santa Fe was meant to be sold to Fides Group and Grupo Energia BV in 2005, but in May 2005 Suez and Agbar decided to terminate the concession. The Aguas Argentinas concession serving Buenos Aires was ended in March 2006. The Aguas Cordobesa concession (Ondeo Services 39%, Agbar 17% and five Argentinean companies) was partly sold in December 2006; Agbar selling 12% to Roggio and retaining 5%.

### Chile

Agbar holds 50.1% of the equity of Aguas Andinas via Inversiones Aguas Metropolitanas Limitada (IAM). In 1999 Agbar and Suez acquired 51.2% of Empresa Metropolitana de Obras Sanitarias (EMOS, now Aguas Andinas), Santiago's water supply company, for a total of USD1,135million. In 2002, Agbar's stake was increased from 16.0% to 25.6% through the exercise of a call option at a cost of EUR180million. In 2004, Agbar bought 30.1% of Suez's holding in IAM for EUR139.4million. As a result, Agbar owns 80.2% of IAM, with Suez holding the remaining 19.9%. IAM was listed on the Santiago Stock Exchange in January 2007, with IAM holding 50.1% of the company, CORFO (Chilean Government) 35.0% and a free float of 14.9%.

1999	Santiago	Privatisation of EMOS	5.8million water & sewerage
------	----------	-----------------------	-----------------------------

All 44 districts of the city are to be covered, along with the long-term development of its wastewater services. Revenue growth is being driven by wastewater services expansion. Currently, 100% of the population is served with piped water and 97% by mains sewerage, while 75% of sewage effluents are treated.

Energis sold Aguas Cordillera to EMOS for USD193million in June 2000. The second highest bidder was Biwater at USD179million. At the time, Aguas Cordillera provides water and sewerage services to 116,591 clients (315,000 people) in the Vitacura, Las Condes and Lo Barnechea districts of Santiago. Aguas Cordillera has been integrated within Aguas Andinas.

For full details, refer to the Aguas Andinas company entry.

#### Aguas Andinas, profit and loss account

Y/E 31/12 (CLPmillion)	2005	2006	2007	2008	2009
Water revenues	121,919	125,655	115,886	135,177	145,617
Sewerage revenues	96,712	114,940	106,032	128,307	139,292
Other – regulated	10,824	10,954	8,720	15,428	12,681
Other – non regulated	17,415	19,963	25,952	26,622	29,635
Turnover	219,623	249,322	276,340	299,304	327,255
Operating profits	111,301	112,221	127,358	153,164	171,541
Net income	83,278	90,884	105,697	88,226	123,048
EPS (CLP)	12.67	10.04	17.27	14.42	20.11

	2005	2006	2007	2008	2009
Water clients ('000)	1,503	1,550	1,598	1,828	1,871
Sewerage clients ('000)	1,474	1,521	1,569	1,784	1,827
Water coverage	100%	100%	100%	100%	100%
Sewerage coverage	98%	98%	98%	98%	99%
Sewage treatment coverage	69%	72%	74%	74%	73%

In 2008, seven municipal areas were added to AA's concessions, providing 5,627 new connections. Negotiations with nine municipalities covering 10,409 connections are underway.

1995	Valdivia	Concession	120,000 water & sewerage
------	----------	------------	--------------------------

The concession was awarded to Aguas Décima SA. 120,000 people are served via 26,000 client contracts for water and 21,500 for sewerage. The first objective for the concession is to connect the outstanding 4,500 customers to the sewerage service.

2008	ESSAL	Acquisition	650,000 water and sewerage
------	-------	-------------	----------------------------

Iberdrola's Iberener acquired 51% of Empresa de Servicios Sanitarios de Los Lagos SA (ESSAL) from the Chilean Government for USD94million in 1999. 35% of ESSAL is now held by the Government and 10% by its staff. ESSAL is one of Chile's smaller water companies and is based in Region X in the south of the country. ESSAL serves 166,000 customers (650,000 people, against 500,000 in 1999) in the Region, which includes the cities of Osorno and Puerto Montt, with a population growth of 6% pa. USD240million in investments is called for, to increase the number of water connections within its operating area and to develop sewerage services and sewage treatment facilities, with the aim for universal sewerage and sewage treatment by 2005. Aguas Andinas acquired ESSAL's holding for CLP72.5billion in March 2008.

## Uruguay

Agbar acquired 60% of Aguas de la Costa at the end of 1997. The company sold this stake back to the Government's OSE in 2006 for USD3.4million, part of which was in turn was acquired by two local companies STA Ingenieros (30%) and Benencio SA (10%).

## Brazil

Agbar gained the concession to operate water and wastewater services for Campo Grande in 2001. In 2005, Agbar sold its 50% stake in Aguas Guariroba to a consortium formed by Bertin and Equipav (See company entry for Grupo Equipav SA), who also acquired 31% from Copel. Aguas sold its stake for BRL57million.

## Colombia

1995	Cartagena	25 year concession	944,000 water & sewerage
------	-----------	--------------------	--------------------------

Aguas de Cartanega SA ESP has been profitable since its onset. 44.8% of its shares are held by Agbar, 50% by Distrito Turistico y Cultura de Cartagena and 5.1% by local shareholders. Agbar's stake cost COP280million. In 2008 water coverage was 100% against 73% in 1995, with sewerage coverage at 83% against 61%, with the aim for 88% sewerage coverage by the end of 2009. Water services have been provided to 350,000 people since the concession started (93% urban poor) and sewerage services to 240,000 (90% urban poor). Aguas de Cartagena has 132,000 water customers and 102,000 sewerage customers. In 2006, Agbar agreed to continue running the concession after consultations with the city. During 2005, net profits eased by 8.9% to COP7.77billion, with a 6.0% increase in revenues to COP96.3billion.

## Cuba

Interagua formed Aguas de La Habana, a JV with the Cuban Government in 1999, for two water management contracts currently serving 1,200,000 people, with an eventual coverage of 1,400,000 people. The contract serves La Havana and Varadero. Water supply systems were renovated for 298,000 people in 2001-02. In February 2000, Interagua was awarded a 25 year water management contract for Havana.

### Service development in Varadero and Havana

<b>Varadero</b>	<b>1994</b>	<b>2006</b>
Population covered	95%	100%
Hours service/day	18	24
Number of connections	5,000	11,000
<b>Havana</b>	<b>2000</b>	<b>2006</b>
Population covered	95%	100%
Hours service/day	8	10
Number of connections	327,000	365,000

Source: Presentation by José María Tura, General Manager of Aguas de La Habana to Agbar conference "Five international examples of environmental management in the service of the citizens" on 19th June 2007.

**Mexico**

2001	Saltillo	25 year concession	711,188 water & sewerage
------	----------	--------------------	--------------------------

Agbar has gained 49% of Empresa Paramunicipal, the company responsible for the management of the drinking water supply and sewerage services in the city of Saltillo, in the state of Coahuila situated in northern Mexico. The remaining 51% is to be held by Sistema Municipal de Aguas de Saltillo (SIMAS). The city of Saltillo was founded in 1577. In 2004, water was supplied to the entire population (146,245 customers), with 92% served by sewerage. During 2005, the sewerage network will be completed. Turnover was EUR21million in 2001. EUR81.9million is to be invested during the contract. 7,000 customers were gained during 2007 and 7,277 during 2008.

**Algeria**

In November 2007 the Agbar gained a concession for water supply and treatment in the province of Orán for a term of five and a half years. Orán, located in the north east of Algeria on the Mediterranean coast, has a population of 1.5million inhabitants and after the capital, Algiers, is the second largest city in the country. Société des Eaux Oran, SPA, is 50% held by Agbar and 50% by the Government's Algérienne des Eaux y el Offi ce National de l'Assainissement.

**China**

The Agbar Group is operating a series of water supply and wastewater treatment projects in the province of Jiangsu, through a joint venture with the Golden State Water Group Corporation Group, including Chinese capital in which the Merrill Lynch Group also has a stake. The November 2007 entails a EUR30million investment by Agbar, including EUR14.45million for Agbar's 49% stake in the joint venture company. In December 2008, Agbar increased its holding in the Jiangshu Water Group from 49% to 72%.

The joint venture will be responsible for four 30-year concessions: the management of a waste water treatment plant (with capacity of 300,000m<sup>3</sup>/day) in Nanjing; the construction and management of three potable water treatment plants (350,000m<sup>3</sup>/day in total) in Taizhou, raw water provision (200,000m<sup>3</sup>/day) in Taixing and the management of another potable water treatment plant (50,000m<sup>3</sup>/day) and the related distribution network in Xuyi.

See company entry for the Golden State Water Group.

**Contact Details**

Name: Grupo Agbar  
 Address: Torre Agbar, Avenida Diagonal, 211  
 08018 Barcelona, Spain  
 Tel: +(34) 93 342 20 00  
 Fax: +(34) 93 342 26 70  
 Web: [www.agbar.es](http://www.agbar.es)

Jorge Mercader Miro (Chairman)  
 Angel Simón (CEO)  
 Josep Bague (CFO)  
 Juan Antonio Guijarro (Water, except Catalonia and Balearics)  
 Leonard Carcolé (Water, Catalonia and Balearics)

**FCC (FOMENTO DE CONSTRUCCIONES Y CONTRATAS SA)**

Fomento de Construcciones Y Contratas SA (FCC) is the result of the 1992 merger between Construcciones Y Contratas SA and Fomento de Obras y Construcciones SA (Focsa). Focsa was a Spanish construction company which had traditionally dominated Spain's urban waste collection and street cleaning sectors. Focsa was founded in 1900 and gained the Barcelona sewerage contract in 1911. FCC's water and sewerage operations are the second largest in Spain after Agbar.

In 1999, Alicia Koplowitz sold her 28% stake in FCC to VE. While the original aim was for VE to take control of FCC, the company sold this stake back to Ms Koplowitz for EUR916million in July 2004. The stake sale does not affect the Proactiva joint venture. However, since 2004, FCC has sought new contracts in Latin America on its own, as demonstrated by the Queretaro contract gain in Mexico in 2007.

FOCSA purchased Seragua, a water management company in 1988 and since 2002, all of FCC's water and wastewater service activities have been grouped under Aqualia. During 2006 and 2007, FCC gained three major water contracts in Portugal, Italy and Mexico as well as acquiring one of the leading regional utilities in the Czech Republic. Further contract gains were made in Central & Eastern Europe, Portugal and Mexico in 2008 and in Egypt and Mexico in 2009. Aqualia aims to generate revenues of EUR1,618million (pessimistic scenario) to EUR2,223million (optimistic scenario) by 2020.

In 2009, Aqualia developed Aqualia New Europe a 51:49 joint venture with the European Bank of Reconstruction and Development (EBRD) to seek new concession contracts in Central & Eastern Europe. It has a total capital of EUR163million.

**Fomento de Construcciones Y Contratas SA, profit and loss account**

Y/E 31/12 (EURmillion)	2005	2006	2007	2008	2009
Aqualia – Spain	569	674	715	712	711
Aqualia – International	0	40	74	134	161
Turnover – Aqualia	569	714	790	845	872
Total turnover	7,090	9,481	13,423	14,016	12,670
Operating profit	656	881	1,259	896	731
Pre-tax profit	696	881	1,252	520	450
Net attributable profit	421	536	738	337	307

89.9% of Aqualia's 2008 revenues were in water and wastewater services, 7.6% for design and build projects and 2.3% for industrial water services. At the end of 2008, Aqualia had an order backlog of EUR11,912million, rising to EUR12,208million in 2009, 30% outside Spain.

**Aqualia – revenue breakdown for 2009**

Revenues by client	%	Revenues by service	%
Cities	67.7%	Water supply	75.7%
Private clients (industrial, etc)	21.5%	Other	19.0%
Other public authorities	10.2%	Wastewater treatment	5.1%
Autonomous communities	0.6%	Sewerage	0.2%

**Aqualia - Spanish revenues in 2009**

Region	% share
Madrid	18.7%
Andalucía	17.5%
Castilla La Mancha	7.4%
Canaries	7.3%
Catalonia	6.0%
Extremadura	4.6%
Murcia	1.5%

Region	% share
Rest of Spain	16.5%

#### Aqualia - International revenues in 2009

Country	% share
Czech Republic	9.1%
Algeria	4.7%
Italy	3.3%
Portugal	0.7%
Mexico	0.6%
China	0.1%
Ecuador	0.0%

Aqualia currently serves 12.93million people in Spain: it covers 800 towns and cities and in addition provides sewer cleaning and maintenance services for 6.6million people in 72 cities and towns.

#### Aqualia, people served in Spain by region

Region	People
Catalonia & Balearics	1,350,000
Basque Country, Galicia & NE Spain	3,800,000
Extremadura	530,000
Central & Eastern Spain & the Canary Isles	4,850,000
Southern Spain	2,400,000
Spain - total	12,930,000

#### FCC – water received and wastewater treated in 2008

Water (Million m <sup>3</sup> )	Aqualia	Proactiva	Total
Source			
Groundwater	153.68	112.55	266.22
Surface water	513.19	171.09	684.29
Desalination	3.87	0.00	3.87
Other	20.53	0.00	20.53
<b>Total</b>	<b>691.27</b>	<b>284.64</b>	<b>975.92</b>
Wastewater (Million m <sup>3</sup> )	Aqualia	Proactiva	Total
<b>Total</b>	<b>496.87</b>	<b>8.11</b>	<b>504.97</b>

#### FCC, number of people supplied in Spain and internationally

Country	Water	Sewerage	Total
Spain	7,200,000	9,500,000	13,000,000
Italy	275,000	275,000	275,000
Portugal	294,000	294,000	294,000
Czech Republic	1,070,000	870,000	1,070,000
Venezuela *	552,000	0	552,000
Colombia *	423,000	0	423,000
Argentina *	200,000	0	200,000
Mexico *	6,030,000	0	6,030,000
Ecuador	2,500,000	1,000,000	2,500,000
Egypt	0	1,000,000	1,000,000
China	0	2,000,000	2,000,000
<b>Total outside Spain</b>	<b>11,344,000</b>	<b>5,439,000</b>	<b>14,344,000</b>
<b>Total</b>	<b>18,544,000</b>	<b>14,939,000</b>	<b>27,344,000</b>

\* Includes Proactiva



The Proactiva contracts are examined in the VE entry.

### Czech Republic

FCC acquired SmVaK from Penta Finance in 2006 for EUR248million. SmVaK's 2006 revenues were EUR57million. Penta Finance acquired AWG's 54.30% holding in Severomoravské vodovody a kanalizace Ostrava a.s. (SmVaK) in February 2004 for CZK1.75billion (GBP38million). AWG acquired this stake for GBP19million in 1999. In April 2004 Penta purchased a further 44.07% interest from Suez. 1.5% of the shares are held by Moravian municipalities. In August 2005, the company was given a Baa- short term international debt rating by CRA, the first time SmVaK has been rated. In June 2005 the company issued CZK 2billion in bonds in order to retire earlier debts, with CZK 0.25billion available for acquisitions in Moravia, Poland and Slovakia.

### SmVaK, profit and loss account

Y/E 31/12 (Kčsmillion)	2006	2007	2008	2009
Water – in-house provision (million m <sup>3</sup> )	49.30	46.71	45.38	44.00
Water – third party sales (million m <sup>3</sup> )	26.92	25.90	24.79	24.36
Water – people served	841,624	814,109	815,698	832,959
Sewerage – people served	507,203	508,965	515,564	531,770
Sewage treatment – people served	502,070	505,634	505,429	529,768
Sewerage – municipalities served	70	72	73	77
Water supply revenues	N/A	1,077	1,106	N/A
Wastewater treatment revenues	N/A	625	659	N/A
Revenues	1,734	1,831	1,955	2,038
Pre-tax profits	319	382	468	559
Net profits	246	389	371	452

SmVaK holds the water and sewerage management contract for the Severomoravske region, including serving the Frýdek – Místek, Karviná, Nový Jičín, and Opava regions, along with the cities of Ostrava, Hlučín, Studénka, and for other municipalities of Moravia and Silesia region; and under a contract, it also supplies water to near-border areas of Poland. It owns 26 water treatment plants and operates 65 sewage treatment plants (7 primary & 58 secondary). Currently, 1.07million of the region's 1.20million inhabitants are connected to the mains water supply and 0.87million to the sewerage network. SmVaK is the second largest water and wastewater entity in the Czech market.

### Portugal

2008	Elvas	30 year concession	23,000 water & wastewater
------	-------	--------------------	---------------------------

This EUR93million contract includes EUR7million in capital spending.

2008	Campo Major	30 year concession	51,000 water & wastewater
------	-------------	--------------------	---------------------------

2006	Leziria del Tajo	40 year concession	220,000 water & wastewater
------	------------------	--------------------	----------------------------

This contract involves EUR200million in capital spending (EUR53million from public funding) and will generate total revenues of EUR1,500million. It is being operated with Lena of Portugal and covers the cities of Almeirim, Alpiarça, Benavente, Cartaxo, Chamusca, Coruche, Golega, Salvaterra de Magos and Santarém.

### Italy

2006	Caltanissetta	30 year concession	275,000 water & wastewater
------	---------------	--------------------	----------------------------

The water and wastewater management contract for the Caltanissetta province in Sicily involves capital spending of EUR247million (EUR85million from public funding) and is expected to generate revenues of EUR1.5billion. Caltanissetta's two largest towns are Gela (72,000) and Caltanissetta

(61,000). Aqualia is the majority participant (51%), the other members being the Italian firms Galva (47%), CCC (1%), Gate (0.5%) and AIEM (0.5%).

### Egypt

2009	Cairo	20 year DBFO	1,000,000 sewage treatment
------	-------	--------------	----------------------------

A 50/50 joint venture with Orascom Construction Industries of Egypt gained the concession which was tendered by the World Bank's IFC. The tertiary facility will handle 250,000m<sup>3</sup> of wastewater a day.

### Mexico

2009	El Realito	25 year DBFO	850,000 water
------	------------	--------------	---------------

A EUR750million project, which will start in January 2010 and awarded to FCC and Mexico's ICA.

2007	Queretaro	20 year concession	700,000 water
------	-----------	--------------------	---------------

A EUR200million project that will deliver and treat bulk water at 130,000m<sup>3</sup> per day to the greater Queretaro area, generating revenues of EUR330million over the operational period. Aqualia holds 26% of the concession company.

### Latin America - Proactiva

Turnover for Proactiva Medio Ambiente was EUR443million in 2000, with net profits of EUR7.3million. Revenues have been impacted by currency weakness and fell to EUR145million in 2002. This has been further reduced to EUR34million in 2003 due to the non-renewal of a number of contracts, most notably for Puerto Rico. Revenues have recovered since, rising to EUR403million in 2009 with an EBITDA of EUR83million.

### Argentina

Proactiva Medio Ambiente was awarded the Catamarca contract in April 2000 for water supply management for the departments (parts of the town) of Capital, Vallejo Viejo and Fray Mamerto Esquiú in the province of Catamarca, in the northwest part of the country. It was rescinded in 2006.

### Venezuela

1997	Monagas	30 year concession	552,000 water
------	---------	--------------------	---------------

Proactiva Medio Ambiente Venezuela gained the Hidrocapital concession for the water supply and sewerage for the north east sector of Caracas in July 2002. The service area has 650,000 inhabitants. Forecast revenue is USD2million per year.

### Colombia

1996	Tunja	20 year concession	151,000 water & wastewater
2000	Monteria	20 year concession	329,000 water & wastewater

The Monteria concession was gained by Proactiva Medio Ambiente in December 1999 and will generate COP29billion in revenues, with COP10.5billion in investments over the contract life. It serves 329,000 with water and 124,000 with sewerage. The Tunja concession serves 151,000 with water and 148,000 with sewerage.

### Mexico

VE's JV company Omsa, operates four contracts serving a total of 6.0million people. Since 1993, VE's stake in Omsa has increased from 33% to 38% in 1996, to 45% in 1997 and to 50% in 1998. ICA, VE's partner, is a Mexican civil engineering and construction company. Caasa serves 506,000

people in the city and more than 300,000 in the surrounding areas; 851,000 with water and 843,000 with sewerage. The 30 year concession was granted in October 1993.

Sapsa (Mexico City)	2.43million	Water management services (1993-2009)
Caasa (Aguascalientes)	0.85million	Water and waste water concession
Puebla	1.20million	Water and waste water concession
Acapulco	1.50million	Water and waste water concession

### Ecuador

2001	Guayaquil	30 year concession	2.5million water & wastewater
------	-----------	--------------------	-------------------------------

International Water (Edison / Bechtel) sold its 90% holding in International Water Services (Guayaquil) Interagua C.Ltda (ECAPAG) to Proactiva in December 2008. Edison wrote down EUR12million on the sale. The principal targets in 2001 were to reduce non revenue water from 70% to 30% and to connect 300,000 people in informal settlements, especially in Isla Trinitaria, where by 2004 piped water was made available for a seventh of the cost of the water vendors.

International Water Services (Guayaquil), contribution to Edison's profit and loss account

EURmillion	2004	2005	2006	2007
Revenues	27	31	34	29
EBITDA	4	8	10	7
Capital spending	N/A	N/A	8	13

During the first five years of the concession, Interagua invested USD50million in extending services to the city, connecting 40,000 new clients to the city's mains water and 20,000 to sewerage systems. Between 2006 and 2011, the company will invest USD250million in new infrastructure, with the aim of providing water services to 95% of the city's residents and sewerage for 90%. A cross subsidy rate scheme ensures that industrial clients subsidise in part the water that is used by residents.

### China

2005	Bengbu	25 year BOT	2million wastewater
------	--------	-------------	---------------------

This is FCC's first international contract in Asia and its first since ending its relationship with Veolia. The contract is being operated as a joint venture between FCC's Aqualia and BCCA of China. Bengbu is in Anhui Province and has a population of some 2million people. EUR40million is to be spent upgrading and expanding the city's wastewater treatment works and the contract will generate revenues of EUR500million. Bengbu Treatment Plant Number 1 (100,000m<sup>3</sup> per day) will be managed for 25 years and expanded to 200,000m<sup>3</sup> per day and a second plant (Yantaizi, Treatment Plant Number 2) with a capacity of 200,000m<sup>3</sup> per day will be built and managed. FCC's SPA has been involved in providing equipment for six WWTW projects since 1999, including hardware for the first phase of Bengbu Number 1.

### Contact Details

Name: Fomento de Construcciones Y Contratas SA  
 Address: Federico Salmón, 13,  
 28016 Madrid, Spain  
 Tel: +(34) 91 35 95 400  
 Fax: +(34) 91 34 54 923  
 Web: www.fcc.es

Baldomero Falcones Jaquotot (Chairman and Managing Director)  
 José Trueba (CFO)  
 Migual Jurado (Director, Aqualia)

**SEMBCORP INDUSTRIES LTD**

SembCorp Utilities (SU), a subsidiary of SembCorp Industries Ltd, provides multi-utility services for 35 industrial customers on Jurong Island in Singapore. These include demineralised water (32,600m<sup>3</sup> per day), cooling and refrigerated water (2.86million m<sup>3</sup> per day) and wastewater treatment via three dedicated facilities on an O&M basis. The company has two wholly owned utility subsidiaries in Singapore; SUT Sakra and SUT Seraya, which serve 27 corporate customers as well as other SembCorp subsidiaries in Singapore's Jurong Island.

In July 2010, following a bid announced in April 2010, SembCorp held 92% of Cascall NV's equity. This resulted in the company having two broadly distinct service arms: SembCorp (industrial water and wastewater services) and Cascall (municipal water and wastewater services).

**SembCorp Utilities, profit and loss account**

Y/E 31/12 (SGDmillion)	2005	2006	2007	2008	2009
Utilities	2,945	3,426	3,736	4,478	3,495
Total turnover	7,409	8,107	8,619	9,928	9,572
Net profit	303	1,031	526	507	683
Earnings per share	17.14	58.58	29.57	28.50	38.37

**SembCorp – Industrial water activities**

SembCorp Utilities was established in 1999 to gain O&M and BOT contracts for municipal and industrial water and wastewater projects in the region. SembCorp Water's 18% stake in Cathay International Water was sold back to Cathay and Cathay International Overseas Holdings for USD44.8million in June 2003.

Water and wastewater treatment capacity

Million m <sup>3</sup> per day	2001	2005	2009	2012
Singapore	2.4	2.4	2.8	3.0
United Kingdom	0.0	0.2	0.2	0.2
China	0.0	0.0	0.4	0.5
United Arab Emirates	0.0	0.0	0.5	0.5
Oman	0.0	0.0	0.0	0.1
<b>Total</b>	2.4	2.6	3.8	4.1

**Singapore**

2008	Changi	25 year BOT	400,000 water
------	--------	-------------	---------------

SembCorp NEWater Pte Ltd (100% SembCorp) gained a 25-year NEWater agreement with PUB in February 2008, to design, build, own and operate Singapore's largest NEWater plant at Changi and supply PUB with 228,000m<sup>3</sup> of NEWater a day from 2010. The first-year price for NEWater is SGD0.29966 per m<sup>3</sup>. The first phase entered service in June 2009 and full operations started in 2010.

**UK**

SembUtilities UK provides water services to industrial customers on the Wilton International facility on Teesside, including 120,000m<sup>3</sup> per day of raw water and 48,000m<sup>3</sup> per day of demineralised water. This was acquired for GBP106million and the company has invested GBP259million in the facility. The facility is adjacent to Northumbrian Water's GBP145million Bran Sands wastewater treatment complex.

## China

A BOT for a wastewater facility for the Nanjing Chemical Industrial Park (NCIP) in Jiangsu Province was awarded to SembCorp in 2003. SembCorp has a 95% stake in Nanjing SembCorp Suiyu, along with Nanjing Chemical Industrial Park Company (5%). The total cost of their project has been SGD101million. The first phase had an initial capacity of 12,500m<sup>3</sup> per day from 2005 with an expansion to 30,000m<sup>3</sup> per day from 2007. In September 2005, SembCorp acquired a 100,000m<sup>3</sup> per day water treatment plant BOT serving the park.

In June 2005, SembCorp established an 80%/20% joint venture to acquire, expand, own and operate a 35,000m<sup>3</sup> per day integrated industrial wastewater treatment and industrial water recycling plant in the ZhangJiaGang Free Trade Zone in Jiangsu Province, China. The project has cost SGD65million serves 100 industrial customers. In 2009 a 15,000m<sup>3</sup> per day industrial effluent plant was opened, the first in China capable of receiving this wastewater without pre-treatment.

A joint venture contract to build, own and operate an industrial wastewater treatment plant in Tianjin Lingang Industrial Area (TLIA) was announced in 2007. SembCorp Utilities holds 90% of the joint venture company, SembCorp TLIA Wastewater Treatment Company. The CNY70million facility will treat industrial wastewater from chemical industries in TLIA and have a capacity of 10,000m<sup>3</sup> per day. In 2009 the facility underwent an expansion to 20,000m<sup>3</sup> per day at a cost of CNY86million.

In July 2008, SembCorp gained a 30 year (plus 20 year option) to own, manage & operate three water treatment works in the Shenyang Economic & Technological Development Zone in Liaoning Province, with a design capacity of 160,000m<sup>3</sup> per day.

A 80% owned joint venture serving the Qinzhou Economic Development Zone in Guangxi Province was awarded a 50 year BOT contract to operate a 15,000m<sup>3</sup> per day industrial wastewater treatment plant in 2010 and this will enter service in 2011.

A potable water provision contract (80% held) for the Shenyang Economic and Technological Development Area has 600 industrial customers and 20,000 municipal customers. The project cost is SGD68million.

## Cascal NV

Biwater was founded in 1968 and in the 1970s, it moved into sewage treatment hardware and developed a number of export markets. In 1989 it acquired the Bournemouth & West Hampshire Water Companies. Biwater is a privately owned company, specialising in water treatment and sewerage engineering. Biwater Capital Plc (now Cascal) was set up in 1998 for international concession contracts. The company has been seeking bids in most of the currently active international markets, with a balance between wastewater and water provision. In 2000, Biwater Capital was renamed Cascal as a 50/50 joint venture with Nuon of the Netherlands. June 2006 saw Biwater buy back the 50% stake in Cascal from Nuon NV. Nuon paid USD130million for its holding in the joint venture in March 2000. Biwater bought out Nuon's share in 2006 and in February 2008, Biwater sold 42% of Cascal NV on the New York Stock Exchange.

## Bid by SembCorp

In April 2010, SembCorp made a bid for Cascal's market listed equity. The bid was supported by Biwater and by July 2010, 92.3% of Cascal's shares were held by SembCorp. The stake cost SembCorp USD191.7million.

## Cascal NV, profit and loss account

YE 31/03 (USDmillion)	2006	2007	2008	2009	2010
Water supply turnover	101.4	107.2	133.2	N/A	N/A
Water contracting turnover	9.3	14.5	27.5	N/A	N/A
Group turnover	110.6	121.7	160.6	163.4	181.8
Operating profit	31.5	36.2	40.2	36.8	38.4
Pre-tax profit	23.1	15.7	22.3	33.2	30.5

The company is looking at a potential pipeline of 37 projects due to be awarded between 2009 and 2013 worth USD1.07billion: Europe (21 projects, USD530million in Bulgaria, Hungary, Lithuania, Poland, Romania, France, Spain and the Ukraine), Asia (11 projects, USD420million in China, Hong Kong, India and the Philippines) and the Americas (5 projects, USD120million in Chile, the USA, Honduras and St Lucia). Cascal is seeking to gain 4-8 contracts between 2008 and 2012. The four year project pipeline in 2008 included 35 projects worth a total of USD1.45billion.

#### Cascal NV, regional breakdown of revenues

Year ended March 31 (USDmillion)	2006	2007	2008	2009	2010
United Kingdom	67.9	75.1	94.8	83.7	81.2
South Africa	13.4	13.8	21.7	20.3	24.5
Indonesia	9.5	11.1	11.4	13.0	14.7
China	0.0	2.9	10.0	20.9	31.6
Chile	6.8	6.4	7.6	11.3	15.3
Panama	0.0	6.2	8.8	10.7	11.1
The Philippines	2.1	2.4	2.9	2.9	3.0
Holding Companies	1.2	0.2	0.7	0.6	0.4
Revenue from continuing operations	100.8	118.6	157.8	163.4	181.8
Discontinued operations (Mexico)	9.8	3.1	2.9	0.0	0.0
<b>Total reported revenue</b>	<b>110.6</b>	<b>121.7</b>	<b>160.6</b>	<b>163.4</b>	<b>181.8</b>

#### Cascal, number of people served internationally

Country	Water	Sewerage	Total
UK	420,000	0	420,000
Philippines	220,000	200,000	220,000
Indonesia	1,030,000	0	1,030,000
Chile	390,000	295,000	390,000
Antigua	83,000	0	83,000
Panama	300,000	0	300,000
South Africa	409,000	0	409,000
China	1,860,000	0	1,860,000
<b>Grand Total</b>	<b>4,712,000</b>	<b>495,000</b>	<b>4,712,000</b>

#### UK

Biwater was the first company to acquire a UK statutory water company, East Worcester Water, in 1988. This company was sold to Severn Trent in 1993. Bournemouth Water (founded in 1863) and West Hampshire Water (founded in 1893) were both acquired in 1989 and merged in 1994. The combined company has 195,000 connections, serving a resident population of 420,000 which rises to 500,000 in the summer. The water companies have formed the backbone of Biwater's profitability in recent years. The UK water company is 100% held by Cascal and has an operating licence in perpetuity, subject to 25 years notice of termination.

#### Bournemouth and West Hampshire Water Plc financial highlights

YE 31/03 (GBPmillion)	2006	2007	2008	2009	2010
Water supply turnover	34.52	34.85	36.93	37.51	38.31
Non-regulated turnover	3.06	4.67	9.73	5.46	1.26
Group turnover	37.58	39.52	46.66	42.87	39.57
Operating profit	14.17	14.34	15.40	13.00	13.99
Pre-tax profit	-3.69*	10.95	10.91	7.57	13.11

\* GBP10.5million before exceptional items

Meter penetration in 2007 reached 50% and is expected to reach 55% by 2009-10 following the installation of 26,860 meters. In 2005, the company refinanced its debt by issuing GBP65million of index linked wrapped bonds under the Royal Bank of Scotland's Artesian programme. These bonds are repayable by 2033 and carry a coupon of 3.084%, with an inflation-related indexation charge on their principal value. Leakage in 2009-10 was 21.8Ml/day against a 2010 target of 22.2Ml/day.

### Antigua

2009	Antigua	12 year BOT	83,000, desalination
------	---------	-------------	----------------------

Cascal Water Antigua was acquired in December 2009. Cascal acquired a 12 BOT awarded by the Antigua Public Utilities Authority in 2004.

### Philippines

1997	Subic Bay	30 year concession	220,000 water & sewerage
------	-----------	--------------------	--------------------------

The Subic Water and Sewerage Company Inc. (Subicwater) is a JV (30% Cascal) with local partners, serving Subic Bay Freeport and Olongapo City. Subicwater was established together with the Subic Bay Metropolitan Authority (SBMA) and the Olongapo City Government to undertake the project by means of a twenty five year concession contract (extended to 30 years in 2003), which is due to expire in 2027 and has a 25 year extension option.

Subicwater took over the operation and maintenance of the existing assets and is undertaking extensive refurbishment work, upgrading treatment works, pipework and rehabilitation and the extension of water distribution and sewerage networks. There are 32,000 water connections and 70Km of water mains and 50Km of sewerage networks.

### Indonesia

1995	Batam Island	25 year concession	1,000,000 water provision
------	--------------	--------------------	---------------------------

The Batam Industrial Development Authority (BIDA) awarded Cascal and its 50/50 local joint venture partners, Bangun Cipta Kontraktor (BCK) and Syabata Cemerlang a 25 year concession contract in 1995 to operate, manage and develop the water facilities on the island of Batam. The partners set up a local company, Adhya Tirta Batam (ATB) to fulfil their concession obligations. Cascal and BCK acquired the Syabata Cemerlang shareholding in November 2002 and now have equal shares in ATB.

Batam Island has enjoyed exceptionally high investment and growth ever since it was designated a special development zone by the Indonesian Government. Non-revenue water has been reduced from 49% in 1995 to 27% in 2007. Further investment is being implemented to reduce non-revenue water to 25%, and even lower over the remainder of the concession period. Due to the high growth, water demand grew by 10% in 2002-03, with 69,000 customer connections. In 2003-04, connections rose by a further 18% to 81,000 and to 122,000 by 2007, with the volume of water delivered rising by 16% during the year. Adhya Tirta Batam currently serves 1,000,000 people, compared with 150,000 at the outset. In May 2008, PT Adhya Tirta Batam undertook to construct a new water treatment plant in Duriangkang, along with approval for a 20% tariff increase. The new construction is the third stage in the development of an integrated potable water system and follows the completion of earlier modules built in 2001 and 2004. The new treatment plant will have a capacity of 11.5million gallons per day, equivalent to a population of almost 200,000, and commenced operations in mid 2009.

2008	Telang Kelapa	23 year concession	30,000 water provision
------	---------------	--------------------	------------------------

Cascal holds 40% of PT Adhya Tirta Sriwijaya, which has a concession for water provision to Sukarme, an area near to Palembang, with a total population of 160,000.

### China

### The China Water Company (CWC)

The China Water Company (CWC) was originally founded by AIDC, a company majority held by the Australian Federal Government. Thames Water Aqua International GmbH acquired 48.8% of CWC for USD20million, plus a USD50million capital injection in 2001. In November 2006, Cascal acquired 87% of the China Water Company Limited from Thames Water, Sime Darby (Hong Kong) and two minority shareholders. China Water has offices in Hong Kong and Shanghai and it owns majority stakes in four water service companies in China which are based in Xinmin and Qitaihe (in the North), Yanjiao (near Beijing) and Fuzhou (in the South East). The water service companies are all joint ventures with local water companies or development zones.

2008	Zhumadian	30 year concession	400,000 water provision
------	-----------	--------------------	-------------------------

In June 2008 China Water acquired 51% of Zhumadian China Water Company, a joint venture in Zhumadian City, Henan Province (Zhumadian Bangye Water Group holding the remaining 49%). Between 2008 and 2010, revenues are anticipated to rise from USD6million to approximately USD13million. The JV will invest USD25million towards the completion of a new water treatment works which will enter service in 2009 and USD16million on allied distribution infrastructure.

2008	Yancheng	30 year concession	800,000 water provision
------	----------	--------------------	-------------------------

In April 2008 Cascal acquired a 49% percent stake in Yancheng China Water Company. The new joint venture company, Yancheng China Water Company, which partners Cascal with the Municipality of Yancheng, formally commenced operations in May 2008. Over the initial 3 years, Cascal expects the new joint venture company to achieve revenues rising from USD9.5million to USD11.7million.

2004	Fuzhou	30 year concession	150,000 water provision
------	--------	--------------------	-------------------------

The Fuzhou CWC Water Company Limited (72% CWC) contract is a 30 year concession which started in December 2004. Fuzhou CWC operates the water supply assets of the Fuzhou Economic & Technological Development Zone (FETDZ) Water Supply Company in Fujian. Construction of the 125,000m<sup>3</sup>/day WTW ran from 2004-2006.

2001	Qitaihe	25 year BOOT	130,000 water provision
------	---------	--------------	-------------------------

The CWC Qitaihe (Heilongjiang, 91% CWC) project is for the construction and operation of water treatment works handling 120,000m<sup>3</sup>/day. Construction took place in 2001-2003.

2001	Yanjiao	25 year BOOT	300,000 water provision
------	---------	--------------	-------------------------

The CWC Yanjiao (Hebei) contract covers water treatment works handling a total of 60,000m<sup>3</sup>/day, which were built between 2001 and 2003.

2000	Xinmin	25 year BOOT	80,000 water provision
------	--------	--------------	------------------------

The CWC Xinmin (Liaoning, 91% CWC) water infrastructure project covers one 30,000m<sup>3</sup>/day water treatment work, built in 2000-2001.

### Chile

The Calama project (wastewater concession serving 150,000 people) was sold to ESSAN, the incumbent private utility in 2006. All contracts are 100% held by Cascal.

2008	Santiago	Perpetual	95,000 water provision
------	----------	-----------	------------------------

Servicomunal and Servilampa were acquired by Cascal in June 2008. The businesses operate perpetually held, regulated water and wastewater concessions serving 23,000 customers in Colina, to the north of Santiago. Revenues of USD6-8million pa are anticipated. Rate increases (5% for Servicomunal and 10% for Servilampa) came into effect in June 2009.



2002	Noranda	22 years	Industry
------	---------	----------	----------

This USD6million project provides 2.2million m<sup>3</sup> pa of treated wastewater to Xstrata, Noranda and other companies in La Negra, Chile, some 45km from Antofagasta. In 2009, Cascal negotiated a one year extension with Xtansa, increasing its supply volume by 30%.

1994	Santiago	Perpetual	13,000 water & wastewater
------	----------	-----------	---------------------------

Cascal acquired Servicios de Agua Potable Barechea SA (SAPBSA) and Aguas Chacabuco SA, two companies operating outside Santiago, with concessions serving medium to high quality residential and industrial areas in the North and East of the city. These have been grouped together as Aguas Santiago SA and started supplying water in 1996. A water treatment works for the Pan de Azucar concession area was constructed in 2004. The company owns USD50million in water rights.

1994	Antofagasta	30 year concession	282,000 water & wastewater
------	-------------	--------------------	----------------------------

This is the first WWTW PSP project in Chile. The Antofagasta facility serves one of the driest parts of the world which has only 3.3mm of rainfall pa. The facility treats waste from a population of almost 342,000 and recycles the water, selling it on to industry and farms. Bayesa received notice of contract termination from Econssa, the state held concession holder in 2010 and this is being contested through an arbitration procedure.

### Mexico

1993-2008	Puerto Vallarta	15 year O&M	250,000 sewerage
-----------	-----------------	-------------	------------------

The first sewage treatment BOOT in Mexico, with a WWTW to secondary standard that entered service in 1995. This plant has enabled Puerto Vallarta to develop into a major international holiday resort. It has a production capacity of 216MI/day. In 2004, the BOOT contract was sold to SEAPAL for a profit of USD12.9million and Cascal's interest continued under an O&M contract until 2008 and was formally terminated in January 2008.

### Panama

2002	Laguna Alta	30 years, BOOT	300,000 water
------	-------------	----------------	---------------

This is Panama's first BOOT water project involving the construction of a 76MI/day potable water treatment plant for Aguas de Panama. The contract serves people in the La Chorrera, Arraijan and Capira areas, west of the Panama Canal. The project was first signed in 2000, and construction started in 2003 with the IFC providing USD15million of the project's USD25million funding. The facility entered service in 2004. Cascal acquired the contract in 2006. The government announced in 2008 that it was seeking for an early termination of the contract and in August 2008 Cascal sought leave to the Supreme Court to protect its interests.

### South Africa

1999	Nelspruit	30 year concession	335,000, water & sewage
------	-----------	--------------------	-------------------------

In 2009, Cascal purchased the 10% of the Greater Nelspruit Utility Co that it did not previously own. The ZAR300million Silulumanzi concession covers the Maputo Development Corridor in Mpumalanga Province and is the fastest growing municipality in South Africa and has the World Cup football tournament due to be held there in 2010. This is the first full privatisation in South Africa. Cascal has taken over billing and revenue collection while modernising the facilities and has focused the concession on improving and expanding service delivery to the townships.

In the first 2 years of operation 91km of new water mains were laid as well as 18km of sewers. At the same time thousands of unregistered connections were found and many household and mains leaks repaired. This has substantially reduced NRW and over 6MI/day have been saved to date; over 8,000 broken meters have been replaced and a further 15,000 new meters have been installed.

1999	Dolphin Coast	30 year concession	54,000 water & sewerage
------	---------------	--------------------	-------------------------

In May 2007, Cascad acquired 73.4% of Siza Water from Bouygues for USD2.9million. Siza Water provides water and wastewater services to approximately 50,000 people in the Dolphin Coast region of South Africa. The Borough of Dolphin Coast in Ballito is one of the main tourist resorts in South Africa and is experiencing rapid growth of both its resident population and its tourist industry. The concession is operated through Siza Water which will make USD172million of investments during the life of the concession. The population served varies between 30,000 (low season) and 100,000 (high season). Siza Water generated revenues of USD5.5million in 2006.

#### Contact Details

Name: SembCorp Industries Ltd  
 Address: 30 Hill Street, #05-04,  
 Singapore 179360  
 Tel: +65-6723-3113  
 Fax: +65-6822-3254  
 Web: [www.sembcorp.com.sg](http://www.sembcorp.com.sg)  
 Web: [www.cascal.co.uk](http://www.cascal.co.uk)

Peter Seah Lim Huat (Chairman)  
 Tang Kin Fei (President and CEO)  
 Lim Joke Mui (CFO)

## **PART 3(ii): COMPANY ANALYSIS: LOCAL/REGIONAL PLAYERS**

## ARGENTINA

### LATIN AGUAS/CHAMAS GROUP

Latin Aguas was founded in 1990 and in 1991 it became the first company to gain a water concession in Argentina. The company is the largest privately held Latin American owned water company. Projects have also been carried out in Brazil, Peru, Nicaragua, Dominican Republic and Ecuador. Latin Aguas is owned by the Chamas family, who specialise in construction work in north east Argentina. Four concessions serving 2.1million people have been gained to date, although the status of one is currently uncertain. In Peru, GTZ Peru/Proagua carried out technical assistance projects in nine regions during 2006.

#### Aguas de Corrientes

This concession, gained in 1991 was the first water and wastewater concession awarded in Argentina. Aguas de Corrientes SA covers 145,500 customers in 10 cities (Saladas, Goya, Mercedes, Esquina, Paso de los Libres, Curuzú Cuatiá, Santo Tomé, Monte Caseros and Bella Vista) of the province of Corrientes. The company was the first water operator to gain the ISO9002 certification for customer service. Three districts Empedrado, Santa Lucía and Yapeyú were incorporated in 2006. This contract is now reported separately from the rest of Latin Aguas, but it remains under the control of the Chamas Group.

#### Aguas de Salta

The 30 year concession for water and wastewater services to Salta province was awarded to Aguas de Salta in 1998. Aguas de Salta is a joint venture between Latin Aguas and JCR. It covers 100 municipalities, with 36% of the population originally having inadequate water and wastewater service coverage. Restrictions on water supply to 160,000 people have been removed to date along with a capital investment of USD32.7million. Customer numbers have been increased by 40%, through enlarging service coverage and improved tariff collection. Revenues have been increased by 109% without a rate rise, through service enhancement and improved billing, with 56% more billing and the collection rate increasing from 68% to 92%. In 2004, a USD44million five year investment plan was agreed with the regulator in return for a ARS48 (USD15.6) per annum increase in water bills for all but the poorest 20% of its customers.

#### Aguas de La Rioja

The contract for the Province of La Rioja (population 280,198) was awarded to Aguas de La Rioja SA in 1999. From 1999-2003 customer connections increased by 37% from 34,952 to 47,838. From 1999-2003, monthly collection of bills from billing revenues rose 27% to 89% resulting in revenues improving by 608% without tariff increases, while operational costs were reduced by 40%. Following political change in 2008, it is understood that the contract may be bought back by the state in 2010.

#### Aguas de Tumbes

The Tumbes concession was awarded to Latin Aguas in October 2005. It covers 14 locations in the Tumbes area and has two water treatment works and 11 wastewater treatment works.

Financial numbers are for the companies set out below are for 2003. Service data is for 31/12/2007, except for Aguas de Corrientes. 2007 revenues were in excess of USD45million, compared with USD78million in 2002. No updates have been made available since 2007.

AR\$million (2003)	Aguas de La Rioja	Aguas de Salta	Aguas de Corrientes	Aguas de Tumbes	Total
Water coverage	98%	95%	N/A	76%	N/A
Customers	56,004	250,112	145,500	37,463	489,079
People served	235,217	1,047,063	634,233	157,387	2,077,307
Sewerage coverage	70%	70%	N/A	46%	N/A
Customers	41,477	183,094	110,076	22,950	357,957

<b>AR\$million (2003)</b>	<b>Aguas de La Rioja</b>	<b>Aguas de Salta</b>	<b>Aguas de Corrientes</b>	<b>Aguas de Tumbes</b>	<b>Total</b>
People served	174,200	769,000	473,329	95,400	<b>1,511,929</b>
Revenues	14.2	47.7	30.5	N/A	<b>83.2</b>

**Contact Details**

Name: Latin Aguas SA  
Address: Buenos Aries 766 (W3400BMH)  
Corrientes, Argentina  
Tel: +54 3783 430017  
Fax: +56 3783 23989  
Web: [www.latinaguas.com](http://www.latinaguas.com)  
Web: [www.aguasdelarioja.com.ar](http://www.aguasdelarioja.com.ar)  
[www.aguasdesalta.com.ar](http://www.aguasdesalta.com.ar)  
[www.aguasdecorrientes.com](http://www.aguasdecorrientes.com)

Dr. Jorge Chamas (President)

**AUSTRALIA****UNITED GROUP LIMITED**

United Group specialises in industrial maintenance, facilities management, commercial property management services, manufacturing, fabrication and construction for the power supply and distribution, water and waste management, mining and mineral processing, oil, gas and LNG and telecommunications sectors. Its United Kingdom subsidiary is involved in integrated facilities management, industrial maintenance and engineering construction. The company is active in Australia, New Zealand, the United Kingdom and Southeast Asia.

In June 2004, United Group paid AUD15million for Thames Water Projects, a company covering Thames' process engineering activities in Australia, Malaysia and Singapore. Thames Water Projects is now called UGL Infrastructure. The company dates back to a water treatment chemicals company operating in Australia in the 1920s which was acquired by Thames when it bought PW Worldwide in 1989. While most of Thames Water Project's activities are for third parties, the acquisition includes Thames Water's industrial water outsourcing project in Victoria. United Water anticipates winning further contracts in water reclamation.

2000	Maffra	10 year BOOT	Wastewater treatment
------	--------	--------------	----------------------

The USD10.6million contract is for an industrial wastewater treatment facility for dairy waste in the state of Victoria. The operations phase runs from 2003-13.

1999	Sydney	25 year BOT	Water and wastewater treatment
------	--------	-------------	--------------------------------

The 8Ml/day water recycling facility entered service in 2000 for the Sydney Olympiad. It consists of a 2.2Ml/day wastewater recovery plant and a 7Ml/day microfiltration and reverse osmosis water treatment plant. The company operates the facility for the Olympic Co-ordination authority.

2007	Mornington	5 year BOT	Wastewater treatment
------	------------	------------	----------------------

Upgrading a 12.5Ml/day wastewater plant serving Mornington Peninsula, Victoria to 16Ml/day for AUD26million. A five year O&M contract runs from 2009-14 at AUD3.5million pa.

United Group aims to develop the division to concentrate on the direct management of water and wastewater treatment assets. The Group's total water and wastewater order book is over AUD250million. Alliance projects have been gained in a number of cities, including Sydney, Perth and Melbourne.

Y/E 31/06 (AUDmillion)	2005	2006	2007	2008	2009
Turnover	1,258.1	2,232.4	2,549.5	3,478.2	4,759.3
Operating profits	63.4	120.2	148.6	203.2	219.2
Net income	47.5	78.7	92.7	136.1	150.3
Earnings per share (AUD cents)	45.8	63.7	67.8	81.8	87.1

**Contact Details**

Name: United Group Limited  
 Address: 40 Miller Street,  
 North Sydney, NSW 2060, Australia  
 Tel: (61 2) 8925 8925  
 Fax: (61 2) 8925 8926  
 Web: [www.unitedgroup.com.au](http://www.unitedgroup.com.au)

Trevor Rowe (Chairman)  
 Richard Leupen (Managing Director and CEO)  
 Rob Bonaccorso (CFO)

**BRAZIL****ANDRADE GUTIERREZ CONCESSOES**

AGC is part of Andrade Gutierrez (AG), one of Brazil's three largest construction companies active in construction projects and concessions throughout Latin America. AG holds 77.22% of AG Concessões (AGC), with the World Bank's IFC owning 13.48% and Fundo de Investimentos em Ações (Fundação Sistel) with 9.29%. AGC holds 27.5% of Domino Holdings and Domino (other holders: Proactiva VE/FCC 30.0%, Daleth Partners 27.5% and Copel 15.0%) in turn holds 34.75% of Sanepar. 52.5% of Sanepar is held by the government of Parana, with the rest being in the market.

<b>FY 31/12 (BRLmillion)</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Sanepar – Revenue	1,105	1,208	1,244	1,310	1,395
Sanepar – EBITDA	497	519	486	541	577
Sanepar – Investments	297	361	500	338	297
AGC – Revenues	364	462	1,096	1,829	2,040
AGC – EBITDA	165	236	391	598	715
AGC – Net profit	186	253	432	673	829
Group revenues	4,371	4,729	6,277	7,891	11,757
Group EBITDA	1,259	1,336	1,398	1,863	2,133
Net profit	58	147	174	427	249

In 1998, Domino Holdings was awarded the concession for Sanepar, the water and sewerage company serving the state of Parana. This is Brazil's fourth largest water utility. Parana borders Argentina and is seen as a growth region in Brazil. Sanepar provides water to 9.0million people and sewerage to 5.4million.

In 2008-09, the major expansion has been in sewerage services, where in excess of a million people were connected to the network over the two years. Except in 2006 (investments of BRL500million), annual investments between 2003 and 2009 were between BRL251million and BRL361million. Sewerage and sewage treatment accounted for 59% of investments in 2009. Water quality meets applicable criteria in 99% of samples. Improved network management has seen water consumption fall from 296 litres per capita per day in 2005 to 237 per capita per day in 2009. The company has operations in 343 of the state's 399 cities and one concession in Santa Catarina. In its operating area, 100% of households have had access to treated water since 2008 and 60.4% are connected to the sewerage network, with 95.7% of sewage collected, the highest level in Brazil.

<b>Sanepar, FY 31/12</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water – people served (million)	8.136	8.313	8.543	8.826	9.018
Water connections ('000)	2,188	2,256	2,325	2,398	2,466
Water billed (m <sup>3</sup> )	438,141	447,163	460,269	472,600	490,700
Sewerage – people served (million)	3.892	4.106	4.438	5.120	5.444
Sewerage connections ('000)	926	1,004	1,098	1,197	1,287
Sewerage billed (m <sup>3</sup> )	217,331	229,694	246,448	265,800	285,700

The acquisition of 85% of Water Port SA by AGC Participações Ltda In 2003 involves the development of a water and sewerage network serving the right bank (30.5% of the total area) of the port of Santos. Construction work started in 2005 and the facility entered service (with a five year operating contract) in late 2007, generating BRL26million pa.

**Contact Details**

Name: Andrade Gutierrez  
 Address: Av. do Contorno, nº 8123, Belo Horizonte - Minas Gerais 30110-910  
 Tel: (31) 3290-6699  
 Web: [www.agsa.com.br](http://www.agsa.com.br)  
 Web: [www.sanepar.pr.gov.br](http://www.sanepar.pr.gov.br) / [www.sanepar.com.br](http://www.sanepar.com.br)

Eduardo Borges do Andrade (Chairman)  
 Ricardo Coutinho de Sena (President and Chief Executive, AGC)

**CAB AMBIENTAL**

CAB Ambiental is a subsidiary of Galvão Engenharia S/A, a Brazilian company active in sewerage services since 2003. Since its inception in 2006, the company has gained five contracts in Sao Paulo state, three on its own and two jointly. Excluding the SABESP contract, the company provides water to 184,000 people and sewerage and sewage treatment services for 440,000 people.

2007	Palestina, Sao Paulo	30 year concession	9,000, water & wastewater
2008	Alto Tiete, Sao Paulo	15 year concession	3.5million, water
2008	Paranagua, Sao Paulo	17 year concession	140,000, wastewater
2008	Guaratingueta, Sao Paulo	30 year concession	116,000, wastewater
2008	Mirassol, Sao Paulo	30 year concession	55,000, water & wastewater
2009	Alta Floresta, Mato Grosso	22 year concession	50,000, water & wastewater
2009	Pontes de Lacerda, Mato Grosso	23 year concession	40,000, water & wastewater
2009	Colider, Mato Grosso	23 year concession	30,000, water & wastewater

Palestina is a 50-50 joint venture with Brazil's Enops Engenharia. The main Sao Paulo concession (CAB spat) is jointly held with SABESP for the Alto Tiete water treatment system.

BRL171million was spent on investments and acquisitions in 2009, including the start of the Sao Paulo concession in February 2009. Within their concession areas, there was a 100% water connection rate, 79% for sewerage with 51% of sewage generated being treated.

Investments planned for 2009-13 total BRL86 for the seven smaller concessions and BRL323million for CAB spat.

**Contact Details**

Name: CAB Ambiental  
 Address: Rua Gomes de Carvalho, 1510 –  
 1º andar - CEP 04547-005 - V.  
 Olímpia - São Paulo - SP - Brazil  
 Tel: 55 11 3524 1700  
 Fax: 55 11 3524 1790  
 Web: www.cabambiental.com.br

Yves Besse (President)  
 Guiliano Dragone (Technical and operations manager)  
 Ermelinda Lavall (Finance manger)



**COMPANHIA DE SANEAMENTO DE MINAS GERAIS (COPASA)**

Companhia de Saneamento de Minas Gerais (COPASA) operates in the State of Minas Gerais, Brazil and is the third largest water and sewerage company in Brazil in terms of its net revenue. In 2006 the State of Minas Gerais had a total population of 19.5million (with an urban population of approximately 16.5million). COPASA provides water supply services to 603 municipalities and 248 towns and villages (813 locations in all), serving 12.8million people (December 2009) via 3.41million connections (March 2010), along with 1.88million sewage connections (March 2010) serving 6.4million people (December 2009). The number of people being served by water and sewerage contracts is growing at 3% and 11% per annum respectively. In February 2006, COPASA floated 30% of its shares on the Sao Paulo stock Exchange (Bovespa). A secondary placement of shares by the municipality of Belo Horizonte and Minas Gerais took place in April 2008, resulting in 53.1% of the shares being held by the state and 46.9% by private and institutional investors.

**Evolution of activities**

	2005	2006	2007	2008	2009
Water connections (million)	2.927	3.035	3.173	3.278	3.385
Sewerage connections (million)	1.330	1.370	1.494	1.668	1.857
Water (million m <sup>3</sup> )	617.6	575.7	589.7	594.6	602.9
Sewage (million m <sup>3</sup> )	318.9	303.9	317.7	326.4	357.1
People served with water (million)	11.2	11.5	12.0	12.4	12.8
People served with sewerage (million)	5.5	5.8	6.2	6.8	7.5

37.5% of the state's population was connected to COPASA's sewerage treatment services in 2009.

	2004	2005	2006	2007	2008
Sewage treated (million m <sup>3</sup> )	62.0	64.4	75.9	100.9	113.0
Sewage treatment rate	28.8%	28.9%	32.6%	42.0%	49.0%
Concession cities – water	595	608	610	611	611
Concession cities – sewerage	153	169	180	184	192
Operation cities – water	561	570	584	596	600
Operation cities – sewerage	72	78	90	109	141
Connection rate – water	97.3%	97.7%	97.7%	97.8%	97.3%
Connection rate – sewerage	81.4%	82.6%	81.7%	81.0%	80.4%

Concession agreements are negotiated with each municipality, with a typical term of 30 years. The most important contract is for the City of Belo Horizonte, a co-operation agreement that was signed in November 2002. This contract accounted for 37.6% of COPASA's net revenue for the nine-month period ended September 2005. 80% of COPASA's revenue is derived from concession agreements that have at least 14 years to run.

**Principal concession contracts (BRLmillion, 2008)**

Municipality	Concession	Date Signed	Term	Revenues
Belo Horizonte	Water/Sewage	04-2004	30 years	778
Contagem	Water/Sewage	02-1974	99 years	145
Betim	Water/Sewage	12-2004	38 years	95
Monte Claros	Water/Sewage	04-1998	30 years	59
Ipatinga	Water/Sewage	12-1997	25 years	51
Others	N/A	N/A	N/A	1,118
Total	N/A	N/A	N/A	2,247

Y/E 31/12 (BRLmillion)	2005	200	200	2008	2009
Water supply	1,060.5	1,245.4	1,497.4	1,560.4	1,645.2
Sewerage	505.6	546.5	529.9	499.4	556.8
Group turnover	1,476.6	1,681.9	1,836.0	2,060.2	2,202.2
Operating Profits	356.2	433.0	422.	356.5	696.9
Net Profits	288.6	356.4	329.	274.2	525.3
Earnings per share (BRL)	N/A	3.11	2.87	2.39	4.57

COPASA has 1,086 water treatment plants, with a treatment capacity that has grown from 37m<sup>3</sup> per second in 1999 to 40m<sup>3</sup> per second in 2005. By 2008, there were 1,144 water treatment plants in operation, with some of the smaller facilities being replaced by new, larger plants.

30% of sewage collected was treated at 36 wastewater treatment plants with a capacity of 6.2m<sup>3</sup> per second in 2005. 56 more wastewater treatment plants entered service by 2008, with 45 more under construction during 2009-10 and 73 more at varying stages or pre-construction development.

COPASA is continuing to expand its networks, through new concessions and internal growth. Investments were rose from BRL805million in 2008 to BRL1,032million in 2009 (BRL516million for water and BRL495million for sewerage).

#### Contact Details

Name: COPASA MG  
Address: Rua Mar de Espanha, 525  
Belo Horizonte - MG, 30330-270, Brazil  
Tel: +55(31)3250-2015  
Fax: +55(31)3250-1409  
Web: [www.copasa.com.br](http://www.copasa.com.br)

Marcio Augusto Vasconcelos Nunes (Vice Chairman, President and CEO)  
Joao Antonio Fleury Tiexeira Anastasia (Chairman)  
Ricardo Augusto Simoes Campos (CFO)

**GRUPO AGUAS DO BRASIL**

Grupo Aguas do Brasil is owned by Queiroz Galvao Participacoes SA-Concessions and Cowan Construction SA. The company was founded in 1997. Aguas do Nova Friburgo (Resende) and Sanej (Jau) were acquired from Tyco International after its sale of Earth Tech to AECOM (USA, see company entry) in 2009. To date ten concessions have been gained, four in Sao Paulo (including Sanej, serving Aracatuba and Aguas de Esmeralda serving Ourinhos) and six in Rio de Janeiro, serving a total of 2.2million people.

2009	Aracoiaba	25 year concession	22,000 water & wastewater
------	-----------	--------------------	---------------------------

Aguas de Aracoiaba was awarded the concession serving Sao Paulo's Aracoiaba Sierra in December 2009. Water treatment capacity has been expanded by 50% and the concession is now addressing sewerage and sewage treatment issues.

2008	Resende	30 year BOT	120,000 water & wastewater
------	---------	-------------	----------------------------

Resende is in Rio de Janeiro. The concession was awarded in January 2008 and BRL136million is to be invested in the system over the contract, 60% in the first six years. The sewage treatment rate increased from 6% in 2008 to 54% in 2009 and is to reach 57% by the end of 2010. The water treatment capacity is being expanded 35% to 60,000m<sup>3</sup> per day.

2000	Jau	25 year DBFO	125,000 wastewater
------	-----	--------------	--------------------

Jau is in Sao Paulo state. The Sanej contract is worth USD80million. Sewage treatment rates reached 80% in 2008 and 100% in 2010.

1999	Goytacazes	45 year concession	150,000 water & wastewater
------	------------	--------------------	----------------------------

Campos dos Goytacazes is in Rio de Janeiro. BRL120million was invested by Aguas do Paraiba in the first ten years, with a further BRL100million budgeted for 2010-20. Wastewater treatment started in 2004. 95% of the population are connected to the water service and 65% to sewerage and sewage treatment, with the aim of 90% coverage by 2013.

1999	Niteroi	45 year concession	250,000 water & wastewater
------	---------	--------------------	----------------------------

BRL250million is to be invested in expanding and upgrading the city's water and sewerage infrastructure, including four new wastewater treatment works to date. Niteroi is in Rio de Janeiro. Water and sewage collection and treatment rates have increased from 72% and 35% respectively in 1999 to 100% water coverage in 2003 and 90% sewerage and sewage treatment coverage in 2007. The contract has been extended to 45 years.

1999	Nova Friburgo	25 year concession	180,000 water & wastewater
------	---------------	--------------------	----------------------------

Nova Friburgo is near Rio de Janeiro. Aguas de Nova Friburgo is responsible for constructing a new sewage treatment facility, expanding the existing water treatment plant, providing ongoing O&M services for plants and distribution and collection systems, installing water meters, and managing the utility billing program. USD70million of investments will be made during the operating period. The first wastewater treatment plant, serving 50,000 people entered service in 2010. Treatment rates will expand to 60% in 2011 and 90% in 2012. The contract can be extended for a further 25 years.

1998	Lakes Region	25 year concession	190,000 water & wastewater
------	--------------	--------------------	----------------------------

Aguas de Juturnaiba serves the cities of Arauama, Saquarema and Silva Jardim in the Lakes Region of Rio de Janeiro. The proportion connected to water increased from 65% in 1998 to 95% by 2009, with 60% currently connected to sewerage and sewage treatment (0.7% in 2001) which will rise to 70% in 2010.

1998	Petropolis	25 year concession	200,000 water & wastewater
------	------------	--------------------	----------------------------

Petropolis is in Rio de Janeiro and the Aguas do Imperador concession was the first to be gained by Aguas do Brasil, in January 1998. BRL80million was invested between 1998 and 2009. 100,000 have been added to the water network and 150,000 to sewerage and sewage treatment.

**Contact details**

Name: Queiroz Galvao Participacoes Concessoes S.A.  
Address: Av. Rio Branco, 156 - 30 andar, Centro, Rio de Janeiro, 20040-901, Brazil  
Tel: 55 21 2131 7100  
Web: [www.queirozgalvao.com.br](http://www.queirozgalvao.com.br)

Name: Grupo Aguas do Brasil  
Web: [www.aguasbr.com.br](http://www.aguasbr.com.br)

**GRUPO EQUIPAV SA**

Equipav is a construction company that was founded in August, 1960, in Campinas, in the State of São Paulo. The company has been involved in water construction projects since the outset, starting with the waste water system for the city of Flórida Paulista. The company has diversified into other areas including waste collection (Colepav, founded in 1993) and managing road concessions.

In October 2005, CIBE Saneamento (Equipav and Heber Participações/Bertin) acquired Agbar's holding in Aguas Guariroba and 31% of Copel's holding. Copel continues to hold 10% and local investors 9%. CIBE's 81% holding in Aguas Guariroba was acquired for BRL80million.

1998	Dos Lagos	25 year concession	360,000 water & sewerage
------	-----------	--------------------	--------------------------

Prolagos serves five cities in the "Região dos Lagos" (Region of the Lakes) in the state of Rio de Janeiro: Cabo Frio, Búzios, São Pedro da Aldeia, Iguaba Grande e Arraial do Cabo. The concession was originally awarded to IPE Aguas de Portugal in 1998 and AG acquired Prolagos from IPE Aguas de Portugal in December 2007. BRL56million was spent between 2002 and 2004 on the construction of four wastewater treatment works. Water coverage has increased from 30% in 1998 to 91% by 2007, with 46% served by sewerage and sewage treatment.

2007	Belford Roxo	concession	400,000 water & sewerage
------	--------------	------------	--------------------------

Águas de Belford Roxo serves the city of Belford Roxo, city in the state of Rio de Janeiro. The concession was awarded directly to GE. The city had a population of 480,000 in 2007.

2000	Campo Grande	30 year concession	730,000 water & sewerage
------	--------------	--------------------	--------------------------

Agbar's Interagua was awarded a water and sewerage contract for Campo Grande in July 2000, which started operations in October 2000 as Aguas Guariroba, a venture 50% held by Agbar, 41% by Cobel and 9% by Sanesul. Currently it is 50% held by Equipav and 50% by Gruppo Bertin. Total investment between 2006 and 2008 was BRL200million. Turnover was EUR27.7million in 1999. The concession currently serves 730,479 people for water and 123,536 for sewerage (17% of the population). Water meters were installed for 20,000 customers in 2001. Sewerage coverage increased to 70% by 2008.

**Contact Details**

Name: Grupo Equipav  
 Address: R. Selma Parada, 201, BI-2 Térreo,  
 Galleria Office Park, CEP 13091-605  
 Vila Madalena, Campinas/SP, Brazil  
 Tel: +55 (19) 3707-4800  
 Web: www.grupoequipav.com.br

**RIOVIVO ENGENHARIA AMBIENTAL LTDA**

Riovivo Engenharia Ambiental Ltda was acquired by Cejen Engenharia in March 2008. The company was used as a vehicle to take over the joint venture Cejen (Fidem) ran with AWG of the UK.

In 1994 AWG's AWI set up Cejen-Anglian (37.5% held), a JV with Fidem owning and operating a deep shaft industrial effluent treatment work in the city of Brusque with a population equivalent capacity of 300,000. The facility serves approximately 200,000 people. Problems relating to the contract meant that a GBP7million write down of assets/development costs was made in 1996/97. Nevertheless, the BOOT facility has been operational since 1996.

In July 2008 Riovivo acquired the shares of the treatment company from AWG and is now responsible for the treatment of effluents in the city of Brusque, in the Vale do Itajaí. Riovivo aims to make Brusque the first city in Brazil with 100% industrial and domestic sewage treatment. The plant has a capacity of 25,000m<sup>3</sup> per day and is currently receiving 10,000m<sup>3</sup> of wastewater a day. The company aims to take over the management of the city's sewerage system which is seen as being in a poor condition. After that, the company aims to expand its operations across the region of Vale do Rio Itajaí, an area with approximately 450,000 inhabitants.

**Contact Details**

Name: Riovivo Engenharia Ambiental Ltda  
Address: Rua Pedro Steffen, 200 - Brusque - SC - 88355-280 -  
Brazil  
Tel: + 55 47 3350 0848  
Fax: + 55 47 3350 1398  
Web: [www.riovivo.com.br](http://www.riovivo.com.br)  
[www.cejen.com](http://www.cejen.com)

Ceciliano Ennes (President)

**SABESP**

In 1877, the Province of Sao Paulo granted a concession for the provision of water and sewage services to Companhia Cantareira de Agua e Esgotos. In 1893, the Province assumed responsibility for the provision of water and sewage services and formed the Reparticao de Agua e Esgotos (Office of Water and Sewers), a Governmental agency. Companhia de Saneamento Basico do Estado de Sao Paulo (SABESP) was founded in 1973. The state water and sewerage company for Sao Paulo was partly floated on the Soma in November 1996 and promoted to the Bovespa exchange in June 1997. The Sao Paulo Government sold a further 19% of SABESP's equity for BRL507million (USD204million) in May 2002 and after further sales in 2003 and 2004 now holds 50.3% of SABESP's equity. The sale took place both on the Sao Paulo Bourse (24.0% of shares) and the NYSE (25.8% of shares).

**SABESP – Breakdown of 2009 revenues and volumes**

	<b>Water Volume</b>	<b>Water Revenues</b>	<b>Sewage Volume</b>	<b>Sewage Revenues</b>
Residential	73%	54%	82%	55%
Commercial	8%	20%	10%	27%
Industrial	2%	6%	3%	8%
Public	2%	12%	3%	10%
Wholesale	15%	8%	2%	<1%

SABESP serves water to 23.4million people in 365 of the 645 cities in the area (65% of the state's urban population), along with six bulk treated water supply contracts serving a further 3.4million people. 100% of the urban population is connected to the water network, 80% to sewerage and 74% of the sewage collected is treated. The company operates 461 sewage treatment facilities and seven ocean outfalls. Distribution losses have fallen from 33.0% in 2003 to 26.0% in 2009. In June 2010 SABESP signed a concession contract with the Sao Paulo municipality to operate the city's sanitation services for 30 years, renewable for a further 30 years.

**SABESP - Concession maturity profile**

<b>Year</b>	<b>Contracts</b>	<b>% revenues</b>
To 2009	82	12.1%
2010	39	2.7%
2011	4	1.1%
2012+	37	5.3%

344 municipalities are served by concession contracts. 147 of the 231 concessions that matured to 2009 have been renewed, along with 35 with post 2009 renewal dates. Where concessions have not been renewed, service is maintained via a short term contract. SABESP own the assets of the Sao Paulo system. They are currently negotiating a 30 year operating contract with the municipality along with 31 other municipalities without a formal contract, accounting for 65.9% of revenues. In addition, a further 16million people live in the state that are currently unserved by SABESP. Water connections have increased by 2.10% pa between 2004 and 2009, with a 3.19% pa increase for sewerage. Water coverage from 2009 to 2018 is intended to grow at 2.0% pa to match population growth, adding 1.57million connections. A 2.9% pa growth in sewerage connections (1.81million) during this time is planned with the aim of increasing the sewerage rate from 80% to 90% and the treatment rate from 73% to 90% by 2018.

**Water provision, billed by region**

<b>Y/E 31/12 (million m<sup>3</sup>)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Sao Paulo Metropolitan Region	998	1,031	1,047	1,066	1,084
Regional Systems	502	513	526	5303	546
Wholesale	259	263	274	285	288
<b>Total</b>	<b>1,759</b>	<b>1,807</b>	<b>1,847</b>	<b>1,880</b>	<b>1,919</b>

Since 2004, a bonus scheme was implemented to encourage domestic and commercial customers to minimise water consumption. This has made a material impact on water usage.

<b>Operating indicators</b>	<b>2008</b>	<b>2009</b>
Water connections (000)	6,945	7,118
Sewage connections (000)	5,336	5,520
Population directly served – water (million)	23.2	23.4
Population directly served – sewage (million)	19.2	19.6
Number of employees	16,949	15,103
Number of connections per employee	738	837
Water produced (million m <sup>3</sup> )	2,853	2,845
Water losses (%)	27.9	26.0

Leakage was reduced from 27.9% in 2008 to 26.0% in 2009, with BRL261million spent on the Water Loss Reduction Programme. In consequence, a 0.3% fall in the volume of water produced contrasts with a 2.1% growth in the billed volume. Losses are planned to fall to 20% by the end of 2013 and 14% by 2018.

### **SABESP – Capex, 2009**

<b>Y/E 31/12 (BRLmillion)</b>	<b>Water</b>	<b>Sewage</b>	<b>Total</b>
Sao Paulo	506.2	237.5	743.7
Regional systems	350.7	740.0	1,090.7
<b>Total</b>	<b>856.9</b>	<b>977.5</b>	<b>1,834.4</b>

Water treatment capacity for the Metropolitan Region was 67.7 m<sup>3</sup> per second in 2009 via eight water treatment works and 192 storage reservoirs. By 2013, planned treatment capacity will rise to 74.3m<sup>3</sup> per second. BRL8.0billion in Capex is planned from 2009 to 2013 (BRL1.7billion pa from 2010-13), emphasising sewage treatment and sewerage.

### **National and International possibilities**

Law No. 12,292 which was passed in March 2006, allows SABESP to expand its activities into other states in Brazil and internationally. From 2008, SABESP has been allowed to acquire stakes in other companies, with cooperation agreements signed in Spain, Israel and Costa Rica along with a joint venture (SESAM) with Spain's OHL for a sewage treatment concession in Moi-Mirim. SABESP Environmental Solutions has been established to concentrate on large users.

### **SABESP - profit and loss account**

<b>Y/E 31/12 (BRLmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	5,356	5,527	5,971	6,352	6,731
Operating profits	1,655	1,898	2,076	2,223	2,181
Net income	866	873	1,049	64	1,374
<b>Earnings per share (BRL)</b>	<b>3.79</b>	<b>3.83</b>	<b>4.60</b>	<b>0.28</b>	<b>6.03</b>

### **Contact Details:**

Name: Companhia de Saneamento Basico do Estado de Sao Paulo  
 Address: Rua Costa Carvalho, 300, Pinheiros,  
 Sao Paulo SP 05488-900, Brazil  
 Tel: +55 11 3388 8000  
 Fax: +55 11 3813 0254  
 Web: [www.sabesp.com.br](http://www.sabesp.com.br)

Dilma Seli Pena (Chairman)  
 Rui De Britto Alvares Affonso (CFO)  
 Gesner Jose de Oliveira Filho (President and CEO)



**CANADA****AQUATECH WATER MANAGEMENT SERVICES INC**

Aquatech Water Management Services (AWMS, a separate entity from Aquatech International Corp of Pennsylvania, USA) was founded as SAUR's Canadian subsidiary in 1981. SAUR sold the company to its management and private investors in 2002.

In 2000, Aquatech had water and wastewater revenues of CAD7million. The company served 768,000 people for wastewater and 88,500 for water provision. Some 65% of the private water sector in Canada is controlled by the company. At the time, Aquatech operated 25 wastewater treatment works, with a capacity of 680,000m<sup>3</sup> per day, or a PE of 2,266,666, along with 13 drinking water plants with a total capacity of 74,200m<sup>3</sup> per day.

The company has two principal operating subsidiaries:

- Aquacers (jointly operated with Simo Management and Gest Eau of Canada) has operated the sewerage and wastewater treatment services for Longueuil since 1993.
- Gestion Eaux-Richelieu (jointly operated with P. Bailargeon Ltd of Canada) has operated the sewerage and wastewater treatment services of Saint-Jean-Sur-Richelieu since 1998.

**Contracts gained and retained since 2002 include:**

Régie d'Assainissement de Boischatel (sewerage pumping and wastewater treatment)  
City of Lévis (sewerage pumping and wastewater treatment for the city of Saint-Nicolas)  
City of Longueuil (sewerage pumping and wastewater treatment)  
Creg Quay Corporation (sewerage pumping and wastewater treatment)  
Municipality of Compton (water, sewerage pumping and wastewater treatment)

**Contact Details**

Name: Aquatech Water Management Services  
Address: 101, Roland-Therrien Blvd, Suite 110 Longueuil,  
Québec, J4H 4B9, Canada  
Tel: +1 48 (450) 646-5270  
Fax: +1 48 (450) 646-7977  
Web: www.aquatech-inc.com

Jean-Guy Cadorette (General Manager)  
Jean Pierre Azzopardi (President)  
Yves HF Bélanger (Director, Administration and Finance)

**CAYMAN ISLANDS****CONSOLIDATED WATER**

Consolidated Water Co. Ltd. (CWC) was incorporated as the Cayman Water Co in August 1973, to provide water services in areas where the supply of potable water is scarce. The company provides potable water from two reverse osmosis desalination plants in Grand Cayman Island to the most populated areas of Grand Cayman and a public water utility in parts of the Cayman Islands under a 20 year exclusive license from the Government of the Cayman Islands awarded in 1979 and renewed in 1990, with renewal rights in 2010. The Lower Valley facility has its contract renewed for seven years in 2006 and is to be upgraded from 0.79mg/day to 1.06mg/day. There were approximately 5,000 residential and commercial customers (hotels, condominiums etc.) served in the Cayman Islands at the end of 2009 compared with 3,300 in 2003. In 2009, there were 57,000 residents in the islands.

SeaTec Belize Limited was acquired in 2000. SeaTec has operated a desalination plant on Ambergris Caye in Belize, since 1996. The population of Ambergris Caye was 20,000 in 2009. This company has been renamed Belize Water Ltd. (BW). BW serves some 4,500 people in Belize. In 2005, the Government of Belize acquired the facility, which CWC continues to operate. In addition, CWC has developed two desalination plants in the Bahamas that are providing water to leisure developments on those islands. The company is concentrating on projects on the two Bimini Islands, serving 1,600 people.

In February 2003, the CWC acquired a series of operations in the British Virgin Islands, Barbados the Bahamas and the Cayman Islands. The USD25million package involves managing water treatment plants capable of desalinating 8million gallons of water per day. This also involved increasing the company's stake in the Waterfields Co Ltd desalination plant in Nassau, Bahamas from 26.2% to 38.9%. In 2003, the capacity of the British Virgin Island facility was expanded from 1.2 to 1.7million gallons per day. In the Cayman Islands, the West Bay plant was expanded from 720,000g/day to 920,000g/day in January 2008. The major development since 2007 has been the development of activities in the Bahamas, where 10.4million g/day is now produced via two new plants.

**CWC Operations (million gallons per day, 2009)**

Location	Plants	Capacity
Cayman Islands	8	10.2
Bahamas	3	10.4
Belize	1	0.6
British Virgin Islands	3	2.5
Bermuda	1	0.6
<b>Total</b>	<b>12</b>	<b>24.3</b>

Further bids to develop and operate facilities in Bermuda and Barbados are currently under appraisal. Total capacity was 24.3million gallons per day in 2009 compared with 19.8million in 2007.

**CWC principal facilities (gallons per day)**

Location	Plant	Operation	Capacity
Cayman Islands	Abel Castillo	Retail	2,200,000
Cayman Islands	West Bay	Retail	910,000
Cayman Islands	Britannia	Retail	715,000
Cayman Islands	Red Gate Road	Bulk	1,300,000
Cayman Islands	Lower Valley	Bulk	1,100,000
Cayman Islands	North Sound	Bulk	1,600,000
Cayman Islands	North Side	Bulk	2,400,000
Bahamas	South Bimini	Retail	115,000
Bahamas	Windsor	Bulk	3,100,000
Bahamas	Blue Hills	Bulk	7,200,000
Belize	Ambergris Caye	Bulk	550,000

Location	Plant	Operation	Capacity
Barbados	Sandy Lane Resort	Bulk	1,300,000
British Virgin Islands	Jost Van Dyke	Bulk	1,700,000
British Virgin Islands	Tortola	Bulk	700,000
Bermuda	Tynes Bay	Bulk	1,200,000

Retail Water covers the desalination and water distribution operations in the Cayman Islands and Bahamas, Bulk Water the operations in Belize, the Cayman Islands, Bahamas and British Virgin Islands and Services, the company's engineering and management services.

Revenues fell in part during 2009 due to lower energy costs being passed on to the customers and due to projects moving from their construction to operational phases. Operations in Grand Cayman were affected during 2005 by Hurricane Ivan, which struck in September 2004.

#### Consolidated Water Co. Ltd., profit and loss account

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Retail water sales	13.37	18.00	22.23	22.37	23.24
Bulk water sales	11.72	18.30	24.32	30.12	25.91
Services revenues	1.09	1.92	7.53	13.19	8.87
Turnover	26.19	32.23	54.08	65.68	58.02
Operating profits	4.21	7.18	9.21	9.84	10.10
Net profits	5.51	7.52	11.84	7.28	6.60
Earnings per Share (USD)	0.45	0.59	0.79	0.50	0.42

Ownership and operation of the Baughers Bay (Tortola) facility in the British Virgin Islands is currently subject to a legal dispute with the Government over the fair value of the facility.

#### Contact Details

Name: Consolidated Water Co.  
Address: Trafalgar Place, West Bay Road,  
Grand Cayman, Cayman Islands  
Tel: (345) 945-4277  
Fax: (345) 949-2957  
Web: www.cwco.com

Jeffrey M Parker (Chairman)  
Frederick W McTaggart (President and CEO)  
David Sasnett (CFO)

**CHILE****AGUAS ANDINAS**

Aguas Andinas (AA), formerly EMOS, is Santiago's water supply and sewerage company. AA serves 5.8million people via 1.9million customer connections. Water services to Santiago were formally organised in 1861 with the first capital works starting in 1865. AA was founded in 1977 and turned into a limited company in 1989. In June 2000, Santiago had an estimated population of 6.102million.

**Aguas Andinas, number of connections**

	1999	2001	2003	2005	2009
Water	1,152,000	1,376,184	1,435,723	1,502,634	1,871,287
Sewerage	1,120,600	1,346,064	1,404,739	1,474,391	1,826,606

**ESSAL, number of connections**

	2008	2009
Water	181,706	186,913
Sewerage	165,700	171,633

42.0% of the equity of AA was sold to Inversiones Aguas Metropolitana Ltda (IAM, Suez-Lyonnaise and Aguas de Barcelona) for USD957million and a further 9.2% for USD178million, valuing the company at USD2,180million. Suez sold 30.1% of IAM to Agbar in July 2004 for EUR139million. After a poorly received flotation in 1999, a second share sale in 2002 has resulted in 13% of the equity now being held by outside investors. 35.0% of the equity currently remains in government hands (CORFO), which in 2004-05 planned to sell to institutional investors for USD400million.

**Aguas Andinas, service development**

Revenues are expected to double in the next ten years because of service expansion. At present its charges are amongst the lowest fees in Latin America. Tariffs vary by company, for AA in 2008 it was CLP266 per m<sup>3</sup> and for sewerage CLP242 per m<sup>3</sup> compared with CLP339 per m<sup>3</sup> for water and CLP179 per m<sup>3</sup> for sewerage at Aguas Cordillera and CLP378 per m<sup>3</sup> for water and CLP565 per m<sup>3</sup> for sewerage at ESSAL.

Currently, 100% of the population is served with piped water and 99% by mains sewerage and 72% of sewage effluents are treated, compared with 3% in 2000. Service expansion in recent years has concentrated on adding new connections as Santiago's population has risen. 7,800 connections were added in 2003 through the award of six new concessions, along with two concessions serving 135 customers in 2004 and four serving 1,080 customers in 2005. 2,116 customers were gained through six new concessions in 2007 and in 2008, seven concessions were gained in the Santiago area, serving 5,523 clients, with a further ten under consideration, serving 10,409 clients. Water is also provided to 43,542 customers (261,252 people) living in rural areas which previously did not have a service.

Year (km)	Aguas Andinas		Aguas Cordillera		ESSAL	
	Water	Sewerage	Water	Sewerage	Water	Sewerage
2003	10,683	8,664	1,237	1,056	N/A	N/A
2004	10,820	8,759	1,264	1,060	N/A	N/A
2005	10,979	8,879	1,313	1,072	N/A	N/A
2006	11,111	8,994	1,322	1,084	N/A	N/A
2007	11,256	9,087	1,340	1,093	N/A	N/A
2008	11,621	9,398	1,420	1,123	1,804	1,579

During 2003, 71% of capital spending was for sewage treatment and 11% for sewerage. Water distribution accounted for 8% and bulk water treatment 4% with 6% going on information technology and monitoring. The lower spending in 2004-05 reflects the completion of the main elements of

sewage treatment programme, sewage treatment accounting for 21% of spending in 2005. CLP325billion on capital spending in 2000-2004, compares with CLP85billion in 1995-1999.

### Capital spending

Year (CLPbillion)	Aguas Andinas	Aguas Cordillera	ESSAL
2002	92.33	5.45	N/A
2003	75.51	6.44	N/A
2004	28.31	5.06	N/A
2005	22.18	7.74	N/A
2006	25.88	10.97	N/A
2007	29.75	9.34	N/A
2008	59.40	16.62	2.84

46% of 2008 Capex was on sewerage, 14% on sewage treatment, 10% on water treatment and 24% on water distribution.

### Sewage treatment works

Facility	Completion date	Cost (USDmillion)	Capacity (m <sup>3</sup> /s)	Treatment coverage
El Trebal	2001	150	4.4	23.2%
La Farfana	2003	315	8.8	71.8%
Mapocho	2012	420	6.6	100.0%

The Farfana sewage treatment works handles sewage from 3.3million people, placing it amongst the five largest WWTWs in the world. The USD700million sewage treatment programme involves the construction of 13 smaller WWTWs for 610,000 people in outlying areas. The water recovered from these facilities will be used to irrigate 130,000ha of farmland. In 2008, biogas from the La Farfana facility was treated to provide gas for 35,000 households.

In April 2010 a EUR260million contract was signed with Agbar (51%) and Degrémont (49%) to extend the Mapocho plant from 380,000m<sup>3</sup> per day to 760,000m<sup>3</sup> per day doubling the number of people it can serve to 4.0million. The plant will be operated by Agbar for five years and designed to minimise power needs (60% of its electricity will be internally generated via sludge digestion) and to meet future demand.

### Aguas Andinas, profit and loss account

Y/E 31/12 (CLPmillion)	2005	2006	2007	2008	2009
Water revenues	121,919	125,655	115,886	135,177	145,617
Sewerage revenues	96,712	114,940	106,032	128,307	139,292
Other – regulated	10,824	10,954	8,720	15,428	12,681
Other – non regulated	17,415	19,963	25,952	26,622	29,635
Turnover	219,623	249,322	276,340	299,304	327,255
Operating profits	111,301	112,221	127,358	153,164	171,541
Net income	83,278	90,884	105,697	88,226	123,048
EPS (CLP)	12.67	10.04	17.27	14.42	20.11

	2005	2006	2007	2008	2009
Water clients ('000)	1,503	1,550	1,598	1,828	1,871
Sewerage clients ('000)	1,474	1,521	1,569	1,784	1,827
Water coverage	100%	100%	100%	100%	100%
Sewerage coverage	98%	98%	98%	98%	99%
Sewage treatment coverage	69%	72%	74%	74%	73%

2008	ESSAL	Acquisition	700,000 water & sewerage
------	-------	-------------	--------------------------

Iberdrola's Iberener acquired 51% of Empresa de Servicios Sanitarios de Los Lagos SA (ESSAL) from the Chilean Government for USD94million in 1999. AA acquired 54% of ESSAL for CLP72.5billion in March 2008. ESSAL is one of Chile's smaller water companies and is based in Region X in the south of the country ESSAL serves 186,000 customers (700,000 people, against 500,000 in 1999) in the Region, which includes the cities of Osorno and Puerto Montt, with a population growth of 6% pa. USD240million in investments have seen 100% treated water connection rate in 2009, along with 92% connected to sewerage and 91% sewage treatment.

2000	Santiago	Aguas Cordeillera	315,000, water & sewerage
------	----------	-------------------	---------------------------

Enersis sold Aguas Cordeillera to AA for USD193million in June 2000. The second highest bidder was Biwater at USD179million. In 2000 Aguas Cordeillera served 110,636 customers (280,000 people) for water and 108,919 for sewerage in the Vitacura, Las Condes and Lo Barnechea districts of Santiago. By 2008, the number of customers had increased to 131,398.

2000	Santiago	Aguas Manquehue	13,000, water & sewerage
------	----------	-----------------	--------------------------

50% of Aguas Manquehue was acquired in 2000 and the remaining 50% in 2003. The company has 4,982 water and 4,837 sewerage customers. The company, along with Aguas Los Dominions was integrated into Aguas Cordeillera in 2008.

Zone	Potable water clients
Mapio	106,874
Anticilo	511,769
Mapue	388,954
Cordillera	131,398
Mapocho	507,627
ESSAL	181,706

#### Contact Details

Name: Aguas Andinas SA  
Address: Av. Presidente Balmaceda 1398,  
Casilla No. 1537, Santiago 420, Chile  
Tel: +56 2 496 2001  
Fax: +56 2 496 2641  
Web: www.aguasandinas.cl

Alfredo Norman (Chairman)  
Ivan Yarur Sairafi (CFO)  
Felipe Larrain Aspillaga (CEO)

**AGUAS NUEVAS**

In June 2004, Aguas Nuevas gained ESSAT (Tarapaca region, Aguas del Altiplano), ESSAR (Araucania region, Aguas Araucania) and ESMAG (Magallanes region, Aguas Megallanes), the final three 30 year concessions for Chile's 12 water and wastewater regions. Regions I, IX and XII were the smallest and most rural of the concession areas. The Solari family interests bid USD172million for the three concessions in 2004. In 2008, it sold its interests in the company to the Ontario Teachers' Pension Fund (Canada, 36.3%), Agbar (Spain, 42.7%), Group Santander (Spain, 8.6%) and a number of other entities.

<b>YE 31/12 (CLPmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Connections – water	337,298	349,212	357,129	368,055	377,978
Connections – sanitation	318,103	329,823	334,810	349,700	359,608
Water sales (million m <sup>3</sup> )	66.63	68.32	68.05	69.26	71.83
Turnover	48.76	55.89	61.12	63.51	66.53
Operating profit	20.41	21.09	23.36	N/A	18.81
Net profit	14.23	15.82	16.23	N/A	11.54

**Development of water treatment and distribution coverage**

<b>YE 31/12</b>	<b>2000</b>	<b>2005</b>	<b>2007</b>	<b>2009</b>
Aguas de Altiplano (ESSAT)	87.9%	97.7%	99.1%	99.9%
Aguas Araucania (ESSAR)	4.7%	11.0%	99.3%	99.8%
Aguas Magallanes (ESMAG)	11.7%	89.1%	100.0%	100.0%

**ESSAT, ESSAR and ESMAG: Company characteristics**

<b>Company</b>	<b>ESSAT</b>	<b>ESSAR</b>	<b>ESMAG</b>
Region	I	IX	XII
Purchase price (USDmillion)	74.2	61.3	35.2
Population	482,594	869,535	150,826
Water customers (2007)	129,093	178,430	44,652
Sewerage customers (2007)	124,536	164,402	43,611
Sewage customers (2007)	123,624	150,659	43,062
Water sold (m <sup>3</sup> per second)	2.78	5.50	2.99
Water treatment works	3	27	3
Sewage treatment works	6	30	3

**Contact Details**

Name: Aguas Nuevas  
Address: Isidora Goyenechea 3600, Piso 4,  
Las Condes, Santiago de Chile  
Tel: (56-2) 583 4600  
Web: [www.aguasnuevas.cl](http://www.aguasnuevas.cl)  
[www.agausaraucaania.cl](http://www.agausaraucaania.cl)  
[www.aguasaltiplano.cl](http://www.aguasaltiplano.cl)  
[www.aguasmagallanes.cl](http://www.aguasmagallanes.cl)

Sr. Piero Batalla Casanovas (President)  
Sr. Vicente Domínguez Vial (Vice Chairman)

**ANTOFAGASTA PLC**

Antofagasta PLC/Antofagasta Minerals SA is a Chilean company, listed on the London Stock Exchange that specialises in mineral extraction (especially copper and molybdenum) and road and rail logistics. In November 2003, Antofagasta gained a 30 year concession to operate the water rights and facilities in the Antofagasta Region of Chile previously controlled by Empresa de Servicios Sanitarios de Antofagasta SA (ESSAN). The concession is intended to complement Antofagasta's existing transport and mining activities in the region, including the water distribution business already operated by the Railway.

**Antofagasta Plc, profit and loss account**

<b>YE 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	2,445.3	3,870.0	3,826.7	3,372.6	2,962.6
Operating Profit	1,506.4	2,804.1	2,653.4	1,526.0	1,459.0
Net profit	725.8	1,354.3	1,382.1	2,089.8	1,119.9
EPS (US cents)	73.6	137.4	140.2	173.1	67.7

The concession contract was signed and control of the assets was transferred on 29 December 2003 by Aguas de Antofagasta SA (ADASA), the company's newly created water management subsidiary. The cost of the concession was CLP116.6billion (USD193.8million). Under the concession contract, certain assets and liabilities were transferred to Aguas de Antofagasta by way of a USD27million sale. Other assets (mainly water rights and infrastructure) were transferred by way of concession and will devolve to ESSAN at the end of the 30 year period.

Aguas de Antofagasta consists of two businesses, an unregulated business supplying mines and other industrial users and a regulated business supplying domestic customers. Distribution losses fell from 29% in 2003 to 26.5% in 2007 with plans to take this down to 25%. The company will focus both on the future development of mining operations in the region and the expected increased demand in domestic consumption. Sales to domestic customers were 27.1million m<sup>3</sup> in 2005 and 30.5million m<sup>3</sup> in 2009, with industrial sales of 5.0million m<sup>3</sup> and 13.2million m<sup>3</sup> respectively. Industrial sales have benefited from sales of re-treated water in Calama to mines and industrial clients.

**Aguas de Antofagasta, profit and loss account**

<b>YE 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Customers	127,768	125,790	134,993	-	144,000
Water sales (million m <sup>3</sup> )	33.1	37.8	39.9	42.7	43.7
Turnover	53.7	63.7	67.1	84.8	83.6
EBITDA	33.9	41.4	40.7	42.3	45.3
Pre-tax profit	25.1	N/A	N/A	N/A	N/A

Non-regulated services are being expanded with a 15 year supply contract for mining water to BHP's Spence project near El Tesoro running from July 2006 (2.3million m<sup>3</sup> in 2006 and from 2007 4.7 million m<sup>3</sup> per annum). In March 2009 ADASA acquired the Antofagasta desalination plant from Desalant SA for USD52.5million. ADASA continues to be the sole customer of the plant and is now in full control of the plant, which provided it with 21.2% of its water for its distribution business in 2009.

**Contact Details**

Name: Antofagasta PLC  
 Address: 5 Princes Gate, London SW7 1QJ,  
 United Kingdom  
 Tel: + 44 20 7808 0988  
 + 562 377 5145  
 Web: www.antofagasta.co.uk

J-P Luksic (Chairman and CEO)  
 P J Adeane (Non-Executive Director)  
 Marco Kuti (CEO Aguas de Antofagasta)



**ESSBIO**

Southern Cross is a private equity group focussing on South America. The Southern Cross Latin America Private Equity Fund LP was created in 1998 and the Southern Cross Latin America Private Equity Fund II LP which was closed in 2003. In February 2006 it acquired Thames Water's interests in Chile for approximately USD300million. In 2007, Empresa de Servicios Sanitarios del Bio-Bio SA (ESSBIO) and Empresa de Servicios Sanitarios de El Libertador (ESSEL) were acquired by the Ontario Teacher's Pension Fund which now holds 50.8% of the Series C equity and 30.0% of the Series A & B equity, along with its associate, Westwater Investment, which holds 20.8% of the Series A equity.

The population served by ESSBIO has increased from 2,027,363 in 2000 to 2,257,778 by 2009. During this time, the number of water connections rose from 509,869 to 664,551 and for sewerage from 424,610 to 582,779.

**ESSBIO, profit and loss account**

Y/E 31/12 (CLPbillion)	2005	2006	2007	2008	2009
Turnover	71.15	78.03	87.70	94.30	94.53
Operating profits	37.87	30.66	34.84	35.26	35.84
Net profits	29.26	18.79	22.22	21.13	24.21
Earnings per Share (CLP)	N/A	71	84	84	92

Between 2000 and 2007, CLP326.0billion has been invested on various projects, CLP35.1billion on water production, CLP65.0billion on water distribution, CLP50.5billion on sewerage and CLP147.5billion on sewage treatment.

Region	Connections	Water	Sewerage	Sewage treatment
O'Higgins	194,821	99%	82%	81%
Bio Bio	469,730	99%	91%	91%
Total	664,551	99%	88%	88%

ESSBIO has 160 wastewater treatment works, 53 in the O'Higgins region and 107 in Bio Bio. Wastewater treatment coverage rose from 42% in 1998 to 88% by 2009 as the capital works programme brought a series of new plants into operation.

Million m <sup>3</sup>	2005	2006	2007
Wastewater treated			
O'Higgins	75.5	81.4	78.4
Cordillera	58.3	72.2	79.3
Costa	121.4	153.4	148.1
<b>Total</b>	<b>255.2</b>	<b>307.0</b>	<b>305.8</b>

Investment totalled CLP410billion for 2000-09, including CLP45billion for water treatment, CLP81billion for water distribution, CLP72billion for sewerage and CLP169billion for sewage treatment.

Y/E 31/12 (CLPbillion)	2005	2006	2007	2008	2009
Water treatment	2.8	2.5	1.7	2.4	5.2
Water distribution	12.9	8.3	9.0	6.5	7.5
Sewerage	14.4	10.5	9.4	8.2	9.7
Sewage treatment	29.8	34.6	7.4	4.5	5.1

ESSEL and ESSBIO have been merged as ESSBIO. ESSEL is now referred to as the O'Higgins region.

2000	ESSEL	Asset ownership	600,000 water & sewerage
------	-------	-----------------	--------------------------

Inversiones Andes Sur, the TWI/EDP JV acquired ESSEL of Chile for USD136million. The company serves 600,000 people in the city of Rancagua in Chile's 6<sup>th</sup> Region. ESSEL had a 2001 turnover of USD19million. TW acquired 25.5% of ESSEL for USD67.6million in March 2000, and bought out EDP's share of the company for USD70.5million in December 2001.

2000	ESSBIO	Asset ownership	1,500,000 water & sewerage
------	--------	-----------------	----------------------------

TW acquired 50.96% of ESSBIO for USD336million between September and October 2000. Located in Concepción, 350 miles south of the capital, Santiago, ESSBIO serves 1.5million people in Chile's 8<sup>th</sup> region, and had a 2001 turnover of USD46.9million. Capital investment of approximately USD180million between 2002 and 2006 is planned, primarily targeted at wastewater treatment in Concepcion (entered service in 2003, serving 500,000 people) and Los Angeles (140,000 people).

#### Contact Details

Name: ESSBIO  
 Address: Tucapel 717, Concepción, 220, Chile  
 Tel: +56 (41) 263700  
 Web: [www.essbio.cl](http://www.essbio.cl)

Kevin David Kerr (Chairman)  
 Stephen Donald Dowd (Vice Chairman)  
 Pedro Pablo Errazuriz Dominguez (CEO)

**ESVAL**

ESVAL was the first Chilean water company to be privatised when AWG and Chile's Enersis acquired 45% of the company in 1998. In July 2001 AWG bought out Enersis's 72% stake in the Aguas Puerto joint venture for USD131million, bringing its total investment in ESVAL's equity to GBP142million. In October 2003, AWG's 44.7% stake in ESVAL was acquired by Consorcio Financiero for USD82million. In May 2004, Aguas Puerto transferred its final 5.04% stake in ESVAL to investment fund administrator Moneda Asset Management. A residue of ESVAL is traded on the Santiago Stock Exchange. The company serves the city of Valparaiso and the adjacent coastal region. In November 2003, ESVAL's Aguas del Valle gained a 30 year concession to operate Essco through a USD89.7million bid and Essco is wholly owned by ESVAL. In December 2007 the Ontario Teacher's Pension Fund acquired 69.8% of ESVAL from the holders, with Corporacion de Formento de la Produccion holding 29.4% and small investors holding the remaining shares.

	<b>ESSCO</b>	<b>ESVAL</b>	<b>Total</b>
Region	IV	V	
People served	510,126	1,392,165	<b>1,902,291</b>
Coverage – water	100%	100%	<b>99%</b>
Coverage – Sewerage	96%	96%	<b>93%</b>
Coverage – Sewage treatment	98%	96%	<b>97%</b>

**ESVAL, consolidated profit and loss account**

<b>31/12 (CLPmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Revenues	92.00	103.44	103.87	109.31
Operating profit	40.17	42.17	37.47	39.56
Net profit	23.40	24.45	19.82	22.48

ESSCO generated revenues of CLP21.9billion in 2007 and net profits of CLP6.0billion. ESVAL generated revenues of CLP71.0billion and a net of CLP17.4billion. Capital spending in 2006 and 2007 reflects the development of sewage treatment and sewerage services, especially at Essco.

		<b>ESSCO</b>		<b>ESVAL</b>
	<b>2006</b>	<b>2007</b>	<b>2006</b>	<b>2007</b>
Water	9%	31%	73%	73%
Sewerage	28%	45%	10%	10%
Sewage treatment	58%	13%	9%	9%

Capital spending at Aguas de Valle was CLP19.49billion in 2006, 58% on wastewater treatment, 28% on sewerage and 9% on water treatment and distribution. In 2007, total investments were USD24.86million, 73% on water distribution and treatment, 10% on sewerage and 6% on sewage treatment. Investments were CLP25.03billion in 2008, 65% on water, 16% on sewerage and 4% on sewage treatment. In 2009, investments totalled CLP16.53billion, 60% on water and 27% on sewerage and sewage treatment.

**Contact Details**

Name: Esval  
Address: Blanco 738, Valparaíso, Chile  
Tel: + 56 12 25 30 84  
Fax: + 45 12 53 29 6  
Web: [www.esval.cl](http://www.esval.cl)  
Web: [www.aguasdelvalle.cl](http://www.aguasdelvalle.cl)

Pedro Pablo Errazuriz Dominguez (Chairman)  
Kevin David Kerr (President)  
Jorge Lesser Garcia Huidobro (Vice President)

**NUEVOSUR**

Southern Cross Group is a private equity group focussing on South America. The Southern Cross Latin America Private Equity Fund, LP was created in 1998 and the Southern Cross Latin America Private Equity Fund II LP which was closed in 2003. In February 2006 it acquired Thames Water's interests in Chile for approximately USD300million. In 2007, Southern Cross sold its interests in Nuevosur to the Ontario Teachers' Pension Fund, with now holds 90.1% of the company's equity.

The Aguas Nuevo Sur, Maule (ANSM) concession contract was purchased by Thames Water for USD171million in November 2001. ANSM is located in the 7<sup>th</sup> region, serving a population of 588,643 and in 2000 generated revenues of USD21.4million. ESSAM is positioned between ESSEL in Rancagua and ESSBIO in Concepcion. In 2009, the company had 216,492 water connections and 205,624 sewerage connections and served 655,534 people.

**Nuevosur, profit and loss account**

Y/E 31/12 (CLPbillion)	2006	2007	2008	2009
Turnover	23.75	28.16	30.32	30.70
Operating profits	6.77	10.12	10.92	9.35
Net profits	2.86	8.26	4.99	3.59

Million m <sup>3</sup>	2003	2005	2007	2009
Water treated	57.2	58.4	60.8	62.2
Wastewater treated	19.3	20.9	74.1	80.2

The Curico WWTW increased treatment from 6% to 24% in 2002 and eight small facilities opened during 2003 increased the treatment rate to 35%. Sewage treatment in the region rose from 35% to 72% in 2004 with the Molina-Lontue wastewater treatment plant entering service. There were 47 wastewater treatment plants in operation in 2009.

In 2009, there were 216,492 clients (against 205,460 clients in 2007), with a 99.7% water coverage in the region, along with 94.5% sewerage and 94.5% sewage treatment.

Between 2000 and 2009, CLP126.0billion has been spent on capital projects, including CLP10.7billion on water production, CLP19.3billion on water distribution, CLP7.7billion on sewerage and CLP76.4billion on sewage treatment.

**Contact Details**

Name: Aguas Nuevo Sur, Maule, S.A.  
 Address: Casa Matriz, Planta de Agua Potable San Luis, Sector Monte Baeza s/n Talca, Chile  
 Tel: (56-71) 204101  
 Web: [www.nuevosur.cl](http://www.nuevosur.cl)

Juan Andres Salas Streeter (President)  
 José Luis Arrano (General Manager)  
 Juan Andres Errazuriz Dominguez (Vice President)

**CHINA****ANHUI WATER RESOURCES DEVELOPMENT CO**

<b>YE 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water Turnover	707	732	707	519	592
Group Turnover	1,304	1,577	1,644	1,625	2,043
Operating profits	44	54	44	28	35
Net profits	29	42	24	12	44
Earnings Per Share (CNY)	0.13	0.19	0.11	0.05	0.20

Anhui Water Resources Development Co., Ltd was listed on the Shanghai Stock Exchange in April 2003. The company is involved in six business lines: Construction, Water, Real Estate, Development of Building Materials, Construction & Operation of Five Star Hotels and Technology consultancy. Water accounted for 43% of 2007 revenues and real estate 22%.

Water activities include operating water and sewerage services and water and wastewater engineering work. The company supplies 800,000m<sup>3</sup> of water per day, equivalent to serving 1.6million people.

**Contact Details**

Name: Anhui Water Resources Development Co Ltd  
Address: South Zhanggongshan Mountain,  
Eastern Sea Avenue, Bengbu, Anhui 233010  
Tel: 086 552 408 1028  
Web: [www.cahsl.com](http://www.cahsl.com)

Wang Jimgmin (Chairman)  
Yang Guangliang (President)  
Niu Xiaofeng (CFO)

**BEIJING CAPITAL CO**

The Beijing Capital Group was founded in 1995 through the amalgamation of 17 state owned enterprises in Beijing. In 1999, the company entered the water sector when it acquired the Gao Bei Dian Water Treatment Plant from the Beijing Municipal Water Treatment Company. Since 1989, the Group has invested over CNY6billion in urban infrastructure development and has average returns of 9-12% on its water activities. BCC was partly floated on the Shanghai Stock Exchange in 2000. It's 72.6% held subsidiary Beijing Capital Co. (BCC) was listed on the Shanghai Stock Exchange in 2000. BCC has invested in a series of water joint ventures and has started to operate its own water contracts, generating revenues of CNY14.8million in 2003. In 2004, Capital Group's income from water services was up 398% over the previous year; this was 23% of the primary business' income and an increase of 17% from the previous year.

Water revenues accounted for 73% of BCC's revenues in 2007. BCC's water treatment capacity in 2005 was 6million m<sup>3</sup> per day, supplying 10million people in total. The capacity rose to 7.4million m<sup>3</sup> per day, serving 14million people in 2006 and by the end of 2007, total capacity was 8.3million m<sup>3</sup> per day. BCC aims to have a total treatment capacity of 15million m<sup>3</sup> per day by 2010.

**Beijing Capital Co**

<b>YE 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Water	202	430	444	450	458
Turnover – Sewerage	18	397	573	642	778
Turnover	471	1,203	1,411	1,734	2,638
Operating profits	-32	240	385	168	390
Net profits	482	452	513	261	447
Earnings Per Share (CNY)	0.22	0.21	0.23	0.12	0.20

Three joint ventures have been signed to date:

**Beijing Water Co., Ltd.** A joint venture established in 2002 by Beijing Urban Drainage Group (51%) and Beijing Capital Co., Ltd (49%), Beijing Water Co., Ltd is focused on city sewage treatment. Its registered capital is CNY4.02billion, ranking first in China. Its two subsidiary factories, Gaobeidian Sewage Treatment Factory and Jiuxianqiao Sewage Treatment Factory, have a total capacity of 2.1million m<sup>3</sup> per day, accounting for 81% of sewage handling capacity in Beijing. 1.2million m<sup>3</sup> per day of capacity was operational in 2006 with 0.9million m<sup>3</sup> per day (serving 2.88million people) under construction.

2002	Maanshan	25 year BOT	550,000 water provision
------	----------	-------------	-------------------------

The Ma'anshan Capital Water Co., Ltd was established by Beijing Capital Co. Ltd, in 2002, with a 30 year concession, BCC has invested CNY90million and holds 60% of the equity. The total capacity of the joint venture is 0.455million m<sup>3</sup> per day, supplying 550,000 people. The company is developing water treatment works in eastern China: Shandong, Jiangsu, Zhejiang and Anhui.

2006	Anyang	25 year BOT	sewage treatment
------	--------	-------------	------------------

The contract covers the Anyang East District Sewage Treatment Plant.

2006	Tongling, Anhui	25 year BOT	350,000 water provision
------	-----------------	-------------	-------------------------

**Beijing Capital VW Investment Co., Ltd.** This company was founded in 2003 following a strategic agreement signed in 2001 and has a registered capital of USD30million; Beijing Capital Co., Ltd (51%) and Veolia Water Investment (49%). This was the first Sino-Foreign investment company in this sector. Three contracts have been gained to date, in Shenzhen, Baoji and Weinan.

In December 2003, the JV announced that it was paying CNY2.94billion for a 40% stake in the Shenzhen Water Group (SWG). Shenzhen Water Holdings Co., Ltd (SWH) was formed out of the merger of the former SWG with the former Shenzhen Sewage Administration on 28, December 2001. This water wastewater service company operates 5 water treatment plants, 4 wastewater treatment plants, 4 sewerage system and 15 fully owned or holding companies. BCC has 55% of the contract's equity, Veolia Environnement 40% and CGE-BC Water Investments 5%. As a water supply and sewage company

SWH's total asset amounts to CNY6.6billion and net assets to CNY5.9billion, of which about CNY2billion is from the former SWG and about CNY4billion from sewage assets.

2003	Shenzhen	25 year BOT	2,400,000 water & sewage
------	----------	-------------	--------------------------

SWH was formed out of the merger of the former SWG with the former Shenzhen Sewage Administration on 28 December 2001. This is the first water group that has transformed from a water company to a company with both water service and wastewater service. With total assets of over CNY6billion Yuan which include 5 water plants, 4 wastewater processing plants, 5 branches, 4 sewage systems and 15 fully owned or holding companies, the state-owned SWH treats 1.672million m<sup>3</sup> per day, 93% of Shenzhen City's drinking water, along with a sewage treatment capacity of 1.082million m<sup>3</sup> per day, accounting for 95% of the City's total. It supplies 500million m<sup>3</sup> of water and treats 300million m<sup>3</sup> of wastewater and its annual turnover is over CNY1billion.

2003	Baoji	25 year BOT	550,000 water provision
------	-------	-------------	-------------------------

The Baoji VW-BC Operation Co., Ltd is 44% held by BCC, along with Veolia Environnement and the Baoji Tap Water Company. The facility has a design capacity of 175,000m<sup>3</sup> per day, covering 550,000 people.

2005	Weinan	29 year BOT	300,000 water provision
------	--------	-------------	-------------------------

In 2005, Beijing Capital Co., Ltd, Veolia Water, and Weinan Water Supply Co., Ltd founded the Weinan VW-BC Operation Co., Ltd. The operation period is 25 years, with BCC holding 44% of the equity, VE 26% and the municipality 30%. Its design capacity is 70,000m<sup>3</sup> per day, covering water provision for 300,000 people.

#### Other contract gains noted

2006	Linyi	25 year BOT	600,000 wastewater treatment
------	-------	-------------	------------------------------

The Linyi Capital Water Co., Ltd. is 40% held by Beijing Capital Co., Ltd, along with 30% by Beijing Capital (HK) Ltd and Linyi Wastewater Treatment Plant holding 30%. The treatment capacity of the company is 150,000m<sup>3</sup> per day, including 100,000m<sup>3</sup> per day in the first phase and 50,000m<sup>3</sup> per day in the second phase, covering a population of 600,000.

2004	Qingdao	BOT	250,000 water provision
------	---------	-----	-------------------------

Qingdao Capital Ruihai Water Co., Ltd. is 40% held by BCC, with the rest being held by Qingdao Municipal Drainage Management Section and Qingdao City Development & Investment Co., Ltd. This joint venture company provides 80,000m<sup>3</sup> of water each day and serves 250,000 people.

2004	Yuyao	25 year BOT	680,000 water provision
------	-------	-------------	-------------------------

The Yuyao Capital Water Co., Ltd is 95% held by BCC and was formed in January 2004. It has a 25 year contract to supply 680,000 people with drinking water, with a capacity of 220,000m<sup>3</sup> per day.

2004	Xuzhou	30 year BOT	1,200,000 water provision
------	--------	-------------	---------------------------

The Xuzhou Capital Water Co., Ltd is 80% held by BCC and 2% by the Xuzhou Tap Water Company. The company supplies 550,000m<sup>3</sup> of water per day, covering a population of 1.2million.

2005	Qinhuangdao	25 year BOT	720,000,water treatment
------	-------------	-------------	-------------------------

Qinhuangdao Capital Water Co., Ltd is 51% held by BCC and 49% by the Qinhuangdao Public Utilities Department. It has a water supply capacity is 390,000m<sup>3</sup> per day, covering a population of 720,000.

2004	Huainan	30 year BOT	550,000 water & wastewater
------	---------	-------------	----------------------------

Huainan Capital Water Co., Ltd. is 88% held by BCC and 12% by Huainan Water Service Co., Ltd. The company has a water treatment capacity of 270,000m<sup>3</sup> per day and a sewage treatment capacity of 100,000m<sup>3</sup> per day, serving a population of 550,000.

2007	Hewenhu	30 year BOT	500,000 water & wastewater
------	---------	-------------	----------------------------

In September 2007, BCC acquired 65% of the Jiujiang Hewenhu Environmental Protection Co., Ltd. from Shenzhen Jin Da Lai Environmental Protection Co., Ltd. and Jiangxi Jin Da Lai Environmental Protection R&D Centre Co., Ltd. The company gained the Hewenhu Sewage Plant and Tail Water Discharge Project BOT in Hewenhu, Jiangxi in 2006. Hewenhu Sewage Plant is expected to process polluted water of 100,000m<sup>3</sup> per day after the first-stage construction, rising to 300,000m<sup>3</sup> per day in the future.

2007	Dongying	30 year BOO	650,000 water & wastewater
------	----------	-------------	----------------------------

In December 2007, Beijing Capital Co., Ltd. and Guozhong Water Investment Co., Ltd. agreed a 30 year BOO contract serving the Shandong Dongying Economic Development Zone Sewage Treatment Plant with a 130,000m<sup>3</sup> per day capacity. BCC also reached a Strategic Cooperation Agreement with Hunan Provincial People's Government in Changsha for the franchise rights to construct and operate new sewage treatment installations in Hunan Province.

2008	Taiyuan, Shanxi	25 year BOT	800,000 sewage treatment
------	-----------------	-------------	--------------------------

A CNY400million project, designed to boost the municipality's wastewater treatment capacity by 200,000m<sup>3</sup> per day.

2008	Haining, Zhejiang	25 year TOT	550,000 water provision
------	-------------------	-------------	-------------------------

The Dingqiao Sewage Treatment Plant will have a 100,000m<sup>3</sup> per day capacity. At the same time BCC acquired 60% of a joint venture with Haining Water Service Group to develop opportunities in the province.

#### Contact details

Name: Beijing Capital Co  
Address: 7<sup>th</sup> Floor, Jinguang Centre No 8,  
Sanhuan Road East, Chaoyang District,  
Beijing, 100028 China  
Tel: 86-010-6468-9035  
Fax: 86-010-6468-9030  
Web: [www.capitalgroup.com.cn](http://www.capitalgroup.com.cn)  
[www.capitalwater.cn](http://www.capitalwater.cn)

Liu Xiaoguang (Chairman)  
Cao Gui Jie (Deputy General Manager)  
Pan Wentang (President)  
Yu Li (CFO)



## BEIJING ENTERPRISES WATER GROUP LTD

Beijing Enterprises Water Group Ltd (BEWG) is listed on the Hong Kong stock exchange as an investment holding company. The company is 58% held by Beijing Enterprises Holdings Limited. At the end of 2008 it had two water treatment plants in China (1,885,000m<sup>3</sup> per day), directly provides 150,000m<sup>3</sup> per day of water along with 24 wastewater treatment plants with a capacity of 1,735,000m<sup>3</sup> per day. In March 2008, Beijing Enterprises Holdings acquired Shang Hua Holdings Limited, a company seeking to develop a portfolio of sewage treatment concessions and was renamed the entity BEWG. The acquisition of ZKC Environmental Group in August 2008 added the first 20 contracts to the portfolio.

Three more contracts were acquired with Shenzhen Hua Qiang was in September 2008, bringing an additional water processing capacity of 315,000 tonnes per day. Shenzhen Hua Qiang held 80%, 83.8% and 55% interests in Shenzhen Hua Qiang Feng Tai Investment Company Limited, Binzhou Hua Qiang Xi Hai Shui Wu Company Limited and Zhanhua Hua Qiang Shui Wu Huan Bao Company Limited respectively. Guigang Water was acquired in January 2009, which had a water processing capacity of 200,000 tonnes per day. Guigang Water is principally engaged in the operations of water supply and treatment, and the provision of the related water supply services in Guigang City, Guangxi province. A sewage treatment plant, known as Guigang Chengxi Sewage Treatment Plant, is currently under construction by Guigang Water.

### Joint ventures in Beijing

In August 2007, BEWG joint venture Beijing Anling Water Technology Company Limited (50% BEWG, 50% Golden State Environmental) acquired the right to finance, invest, design, construct, manage and operate the Beijing No. 10 Water Treatment Plant in Dingfuzhuang, Chaoyang District, Beijing for 23 years. This facility had previously been awarded to AWG in 2000, but had never reached financial closure. The Plant A plans to have total purified water output capacity of 500,000 m<sup>3</sup> per day. Subject to the government's final approval, the preliminary estimation of the total investment in the Plant A is approximately CNY1.5billion (approximately HKD1.5213billion). Other franchise projects include Beijing No. 9 Water Treatment Plant and Phase I of Weifang Water Treatment Plant.

BEWG, profit and loss account

Y/E 31/12 (HKDmillion)	2005	2006	2007	2008	2009
Revenues	66.0	35.8	19.9	337.7	1,730.0
Operating profits	-3.5	-3.2	-2.6	116.2	398.0
Net profits	-16.0	-3.2	-2.6	42.9	228.7
Sewage treatment & construction services	0.0	0.0	0.0	269.6	1,505.6
Water supply services	0.0	0.0	0.0	6.1	60.5
Sewage technical services	0.0	0.0	0.0	50.1	69.2
Sale of sewage treatment works	0.0	0.0	0.0	0.0	94.7
Corporate & others	66.0	35.8	19.9	11.0	0.00

Revenues for 2004-07 are for 30 June.

Revenues for 2008 are for an 18 month period.

Sewage treatment and construction revenues include HKD60.2million and HKD2.4million respectively in interest received from concession contracts.

At the end of 2009, BEWG had 54 plants in development or in operation, including 47 sewage treatment works, 4 water treatment works and 3 water reclamation plants. This includes two build transfer projects, which fall outside the scope of this study. Design capacity in 2009 rose from 1,530,000 tonnes per day to 3,597,100 tonnes per day. The increase in capacity of 2,067,100 tonnes per day was accounted for by Build-Operate-Transfer projects of 868,500 tonnes per day, Transfer-Operate-Transfer projects of 765,000 tonnes per day, Build-Transfer and EPC projects of 92,600 tonnes per day, a self-owned project of 200,000 tonnes per day and an entrustment project of 141,000 tonnes per day.

### Water operations services

There are 38 plants operated in 24 locations. BEWG contracts (year is for the facility entering service):

Year	Location	Type	People served
2002	Jiangyou, Sichuan	30 year BOT	125,000 people, WWTW
2007	Jiangyou, Sichuan	30 year BOT	125,000 people, WWTW
2004	Shuangilu, Sichuan	20 year BOT	125,000 people, WWTW
2002	Mianyang, Sichuan	30 year TOT	500,000 people, WWTW
2003	Mianyang, Sichuan	20 year BOT	250,000 people, WWTW
2010	Mianyang, Sichuan	30 year BOT	250,000 people, WWTW
2009	Shuangliu, Sichuan	20 year BOT	200,000 people, WWTW
2004	Changsha, Hunan	20 year TOT	900,000 people, WWTW
2008	Qingdao, Shandong	40 year BOT	200,000 people, WWTW
2006	Jiaonan, Shandong	20 year BOT	300,000 people, WWTW
2004	Jiaozhou, Shandong	20 year BOT	250,000 people, WWTW
2010	Jiaozhou, Shandong	20 year BOT	250,000 people, WWTW
2007	Heze, Shandong	25 year TOT	400,000 people, WWTW
2008	Guangzhou, Guangdong	25 year BOT	500,000 people, WWTW
2004	Guangzhou, Guangdong	22 year BOT	250,000 people, WWTW
2009	Guangzhou, Guangdong	25 year BOT	500,000 people, WWTW
2004	Guangzhou, Guangdong	22 year BOT	250,000 people, WWTW
2006	Tiazhou, Zhejiang	27 year BOT	200,000 people, WWTW
2006	Tiazhou, Zhejiang	27 year BOT	250,000 people, WWTW
2008	Jinan, Shandong	30 year TOT	50,000 people, WWTW
2010	Jinan, Shandong	30 year BOT	200,000 people, WWTW
2010	Foshan, Guangdong	22 year BOT	250,000 people, WWTW
2008	Yongzhou, Hunan	30 year BOT	250,000 people, WWTW
2009	Yongzhou, Hunan	30 year BOT	100,000 people, WWTW
2009	Yongzhou, Hunan	30 year BOT	50,000 people, WWTW
2009	Yongzhou, Hunan	30 year BOT	50,000 people, WWTW
2010	Shenzhen, Guangdong	20 year TOT	2,000,000 people, WWTW
2003	Shenzhen, Guangdong	25 year BOT	1,000,000 people, WWTW
2006	Binzhou, Shandong	40 year BOT	100,000 people, WTW
2009	Huang Yan, Zhejiang	30 year TOT	400,000 people, WWTW
2009	Chengdu, Sichuan	25 year TOT	500,000 people, WWTW
2010	Qi Qi Har, Heilongliang	30 year BOT	500,000 people, WWTW
2009	Guizhou, Yunnan	30 year TOT	125,000 people, WWTW
2009	Guizhou, Yunnan	30 year BOT	150,000 people, WWTW
2009	Jinzhou, Liaoning	30 year TOT	500,000 people, WWTW
2010	Jinzhou, Liaoning	30 year TOT	500,000 people, WWTW
2010	Jinzhou, Liaoning	30 year TOT	500,000 people, WTW

Total processing capacity, 2009 (m<sup>3</sup> per day/HKDmillion)

Regions	Plants	Design capacity	Treated in year	Revenue
Sewage				
Western China	8	560,000	317,500	115.0
Southern China	4	530,000	423,500	160.8
Shandong	6	255,000	227,000	100.2
Eastern China	2	170,000	61,000	48.0
Northern China	1	100,000	24,000	15.7
<b>Total</b>	<b>21</b>	<b>1,615,000</b>	<b>1,053,000</b>	<b>439.7</b>
Water				
All	3	150,000	95,000	60.5
<b>Group total</b>	<b>24</b>	<b>1,765,000</b>	<b>1,148,000</b>	<b>500.2</b>

**Water & wastewater plants construction services**

BEWG has 12 service concession agreements in place. Details were identified from the 2008 Annual Report and November 2008 acquisition document. In addition, 20 new water treatment plants were under construction during 2009. The total design capacity of these facilities is 1,046,000 tonnes per day.

2008	Zhanhua, Shandong	30 year BOT	75,000 people, WWTW
2008	Guigang, Guanxi	30 year BOT	400,000 people, WTW
2009	Guigang, Guanxi	30 year BOT	440,000 people, WWTW
2009	Leiyang, Hunan	25 year BOT	40,000 people, WTW
2009	Qingzhen, Guiyang	30 year BOT	100,000 people, WTW
2009	Hezhou, Guangxi	30 year BOT	120,000 people, WTW & WW
2009	Qingbaijiang, Chengdu	25 year TOT	200,000 people, WWTW
2009	Pengzhou, Sichuan	25 year BOT	75,000 people, WWTW
2009	Zhongye	25 year BOT	210,000 people, WTW
2009	Changping, Beijing	29 year BOT	60,000 people, WTW
2009	Shuangliu, Chengdu	20 year BOT	125,000 people, WWTW
2009	Nansha, Guangzhou	22 year BOT	250,000 people, WWTW

**Contact Details**

Name: Beijing Enterprises Water Group Ltd  
Address: Room 4301, 43/F  
Central Plaza  
18 Harbour Road  
Wanchai, Hong Kong  
Tel: 852 2796 9963  
Fax: 852 2796 6065  
Web: www.bewg.com.hk

Zhang Honghai (Chairman)  
Hu Xiaoyong (CEO)

**BEIJING HERO CAN**

Beijing Herocan Environmental Engineering is the operating subsidiary of Standard Water, a Singapore based company established in 1996 to develop water and wastewater projects in the PRC. It is owned by Mirage Group, CAN Group (49.9%) and the Standard Chartered IL&FS Asia Infrastructure Growth Fund.

Beijing Herocan is a water, wastewater and waste management & recycling engineering company which has been involved in engineering projects in the sector since 1998. In 2007-08, the company gained nine water and wastewater treatment BOT projects in China, serving an estimated 1.75million people. They are all wholly owned by the company.

30 municipal water and wastewater projects in 13 provinces in the PRC were completed between 2004 and 2006 and 10 BOT/TOT contracts gained in 2007. In September 2009, CNA Group announced that Standard Water had raised a 10 year CNY400million loan for the completion of 17 BOT projects in Shandong, Shaanxi, Zhejiang, Jiangsu and Hebei. Eight of the projects were in the operational phase and a further six at an advanced level of construction. Their combined capacity of 0.4million m<sup>3</sup> per day is equivalent to 2million people served by wastewater systems.

2007	Xinghua, Jiangsu	25 years, BOT	50,000, WTW
2007	Guan County, Shandong	30 years, BOT	200,000, WWTW
2007	Huzhou, Zhejiang	30 years, BOT	150,000, WWTW
2007	Lijin County, Shandong	28 years, BOT	150,000, WWTW
2007	Rizhao City, Shandong	25 years, BOT	250,000, WWTW
2007	Shen County, Shandong	30 years, BOT	200,000, WWTW
2007	Weinan, Shaanxi	30 years, BOT	150,000, WWTW
2007	Xian, Shaanxi	30 years, BOT	100,000, WWTW
2008	Zhaodong City, Heilongjiang	25 years, BOT	500,000, WWTW

**Contact Details**

Name: Beijing Herocan  
Address: 9 Story, Shenghong Building Beijing, No.98 South  
Road of Dongsanhuan, Chaoyang District, Beijing  
Tel: +86 10 5861 1116  
Fax: +86 10 5861 1710  
Web: [www.heroka.com.cn](http://www.heroka.com.cn)  
[www.standard-water.com](http://www.standard-water.com)

Zhang Zhi Gang (Managing Director)  
Ma Ning Ping (Deputy General Manager)

**BIO TREAT TECHNOLOGIES**

Bio-Treat Technologies specialises in developing and implementing wastewater systems using its BMS Biological Process Technology. This process was developed by the company in 1993 and has been used in 500 waste and wastewater treatment projects in China. In 2002, Bio-Treat provided the technology for Global Green Tech Group's (Hong Kong, see company entry) contracts in China. The company was floated in January 2004 and gained its first BOT contract in China (Kunshan) in February 2004. Since then, the company has gained a total of 15 BOT and TOT water and wastewater treatment contracts serving more than 6.25million people along with 13 turnkey projects.

Financial problems during 2008-09 have forced the company to concentrate on existing projects before seeking new projects.

2008	Xuancheng	30 year BOT	250,000, wastewater treatment
------	-----------	-------------	-------------------------------

Xuancheng is in Anhui Province. The CNY66million plant will have a capacity of 50,000m<sup>3</sup> per day. It will enter service at the start of 2010.

2008	Foshan	23 year BOT	250,000, wastewater treatment
------	--------	-------------	-------------------------------

The CNY66million plant will serve Shishan Town, in the Nanhai District of Foshan City in Guangdong. It will have a capacity of 50,000m<sup>3</sup> per day. It will enter service at the start of 2010.

2007	Binzhou	25 year BOT	200,000, wastewater treatment
------	---------	-------------	-------------------------------

The CNY70million plant will serve Binzhou City's Economic Development Zone in Shandong Province. It will have a capacity of 40,000m<sup>3</sup> per day and entered service during 2008.

2007	Nanjing	30 year BOT	200,000, wastewater treatment
------	---------	-------------	-------------------------------

Two wastewater treatment works with a capacity of 20,000m<sup>3</sup> per day will be built at a total cost of CNY67million. The will serve Nanjing City's Luhe Economic Development Zone. Further development of treatment capacity is anticipated and these plants entered service by the end of 2008.

2006	Wuhan	29 year TOT	Wastewater treatment
------	-------	-------------	----------------------

2006	Kunshan	29 year TOT	500,000 wastewater treatment
------	---------	-------------	------------------------------

The CNY376million Wuhan and Kunshan contracts were awarded in July 2006. The Kunshan contract's for the plant developed by the company in 2004-05, while the Wuhan contract involves the rehabilitation of an existing municipally built facility. The Wuhan facility re-entered service in 1Q 2007

2005	Beijing	29 year TOT	200,000 wastewater treatment
------	---------	-------------	------------------------------

The CNY110million contract was awarded in July 2006. The underground facility will have a 40,000m<sup>3</sup> per day capacity. Construction started in 4Q 2006 and was completed within 24 months.

2006	Suzhou	25 year BOT	2million wastewater treatment
------	--------	-------------	-------------------------------

The CNY500million contract was awarded in January 2006. Suzhou is in Jiangsu Province. It involves the construction of a 150,000m<sup>3</sup> per day facility which will eventually become a 450,000m<sup>3</sup> per day complex. Construction took place between mid 2006 and 2008.

2005	Nanjing	25 year BOT	200,000 wastewater treatment
------	---------	-------------	------------------------------

This USD10million 40,000m<sup>3</sup> per day project in Jiangsu Province is being constructed during 2006-07. The operational phase started in 2007. A similar plant may in future be built next to this one.

2005	Jiangdu	23 year BOT	250,000 water treatment
------	---------	-------------	-------------------------

In April 2005, Bio-Treat gained a CNY179million 100,000m<sup>3</sup> per day water treatment BOT contract for the city in Jiangsu Province. The contract will be operated by New Efficient Limited, which is 34% held by Bio-Treat and 65% held by World Eagle. The plant entered service in mid 2007.

2004	Xianjiang	25 year BOT	1million wastewater treatment
------	-----------	-------------	-------------------------------

The Xianjiang (Shaanxi Province) contract incurred a CNY36million cost over-run in 2006. The contract's construction phase was originally meant to run from October 2004 to December 2006 at a cost of CNY288million. It entered service in May 2006 and has a capacity of 200,000m<sup>3</sup> per day.

2005	Lianyuangang	25 year TOT	500,000 wastewater treatment
------	--------------	-------------	------------------------------

Bio-Treat's Perfect Grace Investments Limited owns 95% of the CNY140million project in a joint venture with Oriental Fortune, covering the rehabilitation and upgrading of the city's 100,000m<sup>3</sup> per day wastewater treatment plant. Lianyuangang is in Jiangsu Province.

2005	Lianyuangang	25 year BOT	400,000 wastewater treatment
------	--------------	-------------	------------------------------

Bio-Treat's Perfect Grace Investments Limited owns 95% of a CNY105million project in a joint venture with Oriental Fortune, covering the construction of a new 80,000m<sup>3</sup> per day wastewater treatment plant. Lianyuangang is in Jiangsu Province.

2005	Suqian	30 year BOT	300,000 wastewater treatment
------	--------	-------------	------------------------------

This covers two contracts gained in March 2005 worth a total of CNY178million for the construction of two plants with a capacity of 80,000m<sup>3</sup> per day and 60,000m<sup>3</sup> per day. Construction started in May 2005 and was completed in September 2006. Suqian is in Jiangsu Province.

2004	Kunshan	29 year TOT	500,000 wastewater treatment
------	---------	-------------	------------------------------

The contract for the Kunshan plant was awarded in February 2004 and construction was completed in July 2005 and has a treatment capacity of 100,000m<sup>3</sup> per day.

Y/E 31/06 (CNYmillion)	2005	2006	2007	2008	2009
Turnkey revenues	18%	17%	15%	51%	23%
BOT/TOT revenues	82%	83%	85%	49%	77%
Turnkey gross profit	14%	14%	8%	N/A	N/A
BOT/TOT gross profit	86%	86%	92%	N/A	N/A
Construction contract services	1,023.9	1,287.2	1,356.7	1,098.0	93.5
Service concessions	N/A	N/A	N/A	812.5	60.2
Sales of goods	230.0	259.9	122.6	183.9	31.5
BOT/TOT discharge fee	N/A	12.6	109.4	64.9	61.9
Finance income from concession	N/A	N/A	N/A	93.8	160.8
Group turnover	1,254.0	1,559.7	1,588.7	2,253.9	408.0
Operating profit	379.8	350.4	461.4	-184.5	-676.9
Net profits	327.6	189.0	330.3	-356.8	-703.3
Earnings per share (CNYfen)	0.39	0.22	0.37	-0.40	-0.79

#### Contact Details

Name: Bio-Treat Technology Limited  
Address: Tu Tang Industry Area  
Tu Tang, Changping,  
Dongguan City, Guangdong, China  
Tel: +86 769 399 2606  
Fax: +86 769 382 5638  
Web: www.bio-treattechnology.com

Chan Kong (Chairman and CEO)  
Lau Cheuk Lun (Acting CEO)

**CATHAY INTERNATIONAL GROUP**

Cathay International Holdings (CIH) is a Hong Kong and UK based company founded in 1991. It specialises in hotels, toll roads, power plants and through its minority held subsidiary Cathay International Water (CIW) it has diversified into a number of water treatment plant operation contracts.

In 1996, STIC (now part of Sembcorp of Singapore) acquired an 18% stake in Cathay International's water activities for USD45million. This stake was sold back to CIW and Cathay International (Overseas) Holdings for USD44.8million in June 2003. CIW's shareholders include the Santander Group (since 1991), Nomura/Jafco (since April 1996), UBS (Switzerland, since May 1997) and JP Morgan Securities Asia (since May 1998).

Following a series of contract awards in 1997, seven facilities with a total capacity of 1.89million m<sup>3</sup> per day were rehabilitated or built for USD196.5million.

**Jinan**

1997	Dayang	25 year	Water treatment
------	--------	---------	-----------------

Dayang has a capacity of 0.4million m<sup>3</sup> per day and is being constructed for USD30million. CIW holds 60% of the joint venture.

1997	Three facilities	25 year BOT	Water treatment
------	------------------	-------------	-----------------

Three facilities (Dongjiao, Nanjiao and Xijiao) with a combined capacity of 0.9million m<sup>3</sup> per day are being rehabilitated for USD90million. CIW holds 80% of the joint venture.

**Binzhou**

1997	Donggao	20 year ROT	Water treatment
------	---------	-------------	-----------------

Donggao has a capacity of 40,000m<sup>3</sup> per day and is being rehabilitated for USD9.9million. CIW holds 60% of the joint venture.

1997	Cathay Water Plant	20 year ROT	Water treatment
------	--------------------	-------------	-----------------

The Binzhou Cathay Water Plant Limited has a capacity of 50,000m<sup>3</sup> per day and is being rehabilitated for USD6.6million. CIW holds 60% of the joint venture.

**Jiangmen**

1997	Jiangmen	ROT	Water treatment
------	----------	-----	-----------------

The water plant has a capacity of 0.5million m<sup>3</sup> per day and is being rehabilitated for USD60million. CIW holds 80% of the joint venture.

<b>YE 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	6.3	17.7	34.2	65.1	71.2
Operating profits	-4.1	-2.4	-3.0	4.9	6.3
Net profits	-6.4	-5.3	-8.0	-3.4	-0.3
Earnings Per Share (USD)	-0.03	-0.02	-0.03	-0.01	-0.00

**Contact Details**

Name: Cathay International Holdings Limited  
 Address: 25/F Chartered Bank Building  
 4-4A Des Voeux Road, Central  
 Hong Kong  
 Tel: +852 2828 9289

Soon Lim Sum (Chairman)  
 Jin-Yi Lee (CEO)  
 Ka Chi Siu (Financial Director)

**CHEUNG KONG INFRASTRUCTURE HOLDINGS LTD**

Cheung Kong Infrastructure (CKI) is 85% held by Hutchinson Whampoa Limited and was partly floated on the Hong Kong Stock Exchange in 1996. CKI invested HKD69million in the HKD140million Yueyang water treatment works project serving Yueyang City (Hunan Province) in 1998. This stake was sold for a HKD11million profit in 2003. In addition, CKI's CK Life Sciences has developed a series of bioremediation product applications; WonderTreat™, for treatment of municipal wastewater, contaminated surface water and industrial wastewater. CKI acquired AquaTower of Australia in March 2004. In April 2004, CKI acquired Cambridge Water Plc of the UK from Spain's Union Fenosa for GBP51.4million. Union Fenosa had in turn acquired Cambridge Water for GBP57million in 1999. CKI also holds 4.75% of Southern Water Plc.

**Cheung Kong Infrastructure, profit and loss account**

<b>YE 31/12 (HKDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	2,247	1,822	1,865	2,445	2,184
Operating profits	-617	712	276	82	2,142
Net profits	6,007	3,670	4,772	4,423	5,568
Earnings Per Share (HKD)	2.66	1.63	2.12	1.96	2.47

**Australia: AquaTower**

AquaTower was formed in 2002 to provide potable water to 25,000 people in four regional towns in Victoria. CKI was one of the two original investors in the 25 year BOT project and in 2004 acquired the outstanding 50% held by Abigroup of Australia, CKI holding 49% and CK Life Sciences holding 51%.

**United Kingdom: Cambridge Water**

The Cambridge University and Town Waterworks was founded in 1853 and was floated as Cambridge Water Plc in 1996. Cambridge Water supplies water to 304,000 people (119,700 customers) in the city of Cambridge and certain surrounding districts, with sewerage services being provided by Anglian Water Plc. The population in the service area has increased by 17,000 since 1995. The water and gas and electricity activities were spun off into separate companies and the latter activities were sold to Scottish and Southern Electricity in 2003 for GBP4million. 60% of customers have water meters in 2008, compared with 51% in 2002 and demand for metering is rising by 4% pa. In 2009, 90% of the population lived within district metered areas against 37% in 2006.

**Cambridge Water, profit and loss account**

<b>Y/E 31/03 (GBPmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Turnover	17.51	18.64	20.69	19.31	20.2
Operating profit	3.89	5.12	5.17	4.43	5.2
Pre-tax profit	3.74	4.83	3.59	1.47	N/A

**Contact Details**

Name: Cambridge Water Plc  
 Address: 41 Rustat Road, Cambridge CB1 3QS, United Kingdom  
 Tel: +44 1223 706050  
 Fax: +44 1223 214052  
 Web: [www.cambridge-water.co.uk](http://www.cambridge-water.co.uk)

Michael Halstead (Chairman)  
 Stephen Kay (Managing Director)

**Contact Details**

Name: Cheung Kong Infrastructure  
 Address: Cheung Kong Centre, 2 Queen's Road, Central, Hong Kong  
 Tel: 852 2122 3986  
 Fax: 852 2501 4550  
 Web: [www.cki.com.hk](http://www.cki.com.hk)

Victor Li Tzar Kuoi (Chairman)  
 Kam Hing Lam (Managing Director)  
 Chan Loi Shun (CFO)



**CHINA EVERBRIGHT INTERNATIONAL**

China Everbright International (CEI) is a Hong Kong based company active in Guangzhou Province, providing wastewater for a total of 6.1million people including in Shenzhen (population 1.3million) through a local joint venture and wastewater for Zibo (population 2.6million), along with further projects under development.

YE 31/12 (HKDmillion)	2005	2006	2007	2008	2009
Wastewater turnover	N/A	298.2	550.5	890.1	1,035.7
Turnover	132.9	884.0	1,347.0	1,862.5	1,766.0
Operating profits	38.7	185.9	360.5	607.7	677.2
Other profits	104.1	381.6	65.4	26.4	26.6
Net profits	106.8	460.5	337.9	339.0	371.9
Earnings Per Share (HKD)	0.42	0.16	0.11	0.11	0.11

In 2009, the company had 17 wastewater treatment projects with a total annual wastewater treatment capacity of 550million m<sup>3</sup>. In 2009, the company treated 388million m<sup>3</sup> of wastewater and reduced COD loadings by 143,700 tonnes

2005	Qingdao	25 years, TOT	800,000 wastewater treatment
------	---------	---------------	------------------------------

The Everbright-Veolia Water joint venture was signed in 2003. In August 2004, CEI, Veolia Water and the Qingdao Municipal Government started a project covering the city's Qingdao Haibohe and Qingdao Maidao Waste Water Treatment Plants. The total investment cost of the project is USD42.8million, with CEI holding 60% of the project's equity. CEI is the lead player in the asset owning contract (Qingdao EB-VW Waste Water Treatment Co. Ltd.) and Veolia is the lead player in the operating contract (Qingdao Veolia Water Operating Company Limited). Commercial operation of the plants started in January 2005, with a treatment capacity of 150,000m<sup>3</sup> per day. During 2009, 67.3million m<sup>3</sup> of sewage was treated, compared with 54.4million m<sup>3</sup> in 2005. In March 2005, a consortium led by Veolia Water Systems was appointed by the operating company to extend the plant, boosting overall treatment capacity to 220,000m<sup>3</sup> per day with a total investment of CNY356million. This facility entered service in July 2007.

2005	Zibo	25 years, TOT	1,000,000 wastewater treatment
------	------	---------------	--------------------------------

CEI gained a concession for Zibo's wastewater treatment with the Zibo Municipal Government, Zibo Finance Bureau and Zibo City Environmental Protection Bureau and Zibo City Fisheries Bureau in September 2005. This is a 25 year contract for two plants on a TOT basis, with an investment cost of CNY354million. Operations started in December 2005, with the rehabilitated facilities entering service in May 2008, raising its operating capacity to 250,000 m<sup>3</sup> per day.

2007	Zibo	25 years, BOT	Industrial wastewater treatment
------	------	---------------	---------------------------------

This facility is to serve the city's High-tech Zone, the first phase of which will cost CNY150million with an operating capacity of 100,000m<sup>3</sup> per day.

2009	Zibo	25 years, BOT	200,000 wastewater treatment
------	------	---------------	------------------------------

This is for the city's Zhouchun facility, the first phase of which will cost CNY70million with an operating capacity of 40,000m<sup>3</sup> per day.

2008	Boxing County	30 years, TOT	300,000 wastewater treatment
------	---------------	---------------	------------------------------

In February 2008, CEI signed a two phased wastewater treatment contract with the Boxing County Government, Shandong Province. This covers a 30,000m<sup>3</sup> per day TOT contract (Phase I, a works upgrade) and Phase II, a 30,000m<sup>3</sup> per day BOT contract which will enter service in 2010. The project will cost CNY85million. And will be financed by raising the waste water treatment service fee will be increased from CNY0.75 per tonne to CNY0.9 per tonne. Boxing neighbours Zibo City and has a population of about 478,000.

2008	Jinan	26 years, BOT	500,000 wastewater treatment
------	-------	---------------	------------------------------

In March 2008 CEI signed a concession with the Jinan Municipal and Public Utility Bureau for a 26 year BOT, 100,000m<sup>3</sup> per day Jinan Number 3 wastewater treatment works. The CNY138million facility opened in October 2009.

2006	Jinan	30 years, TOT	2million, wastewater treatment
------	-------	---------------	--------------------------------

The first phase of the Jinan Waste Water Treatment Upgrade Work Project, covering the waste water treatment plants No. 1 and 2 were completed in May 2009 for approximately CNY420million. CEI acquired the two waste water treatment plants in Jinan City by way of TOT in 2006 and secured operation rights of the plants for 30 years. After the completion of the refurbishment work in 2007 and extension work carried out in 2009, their waste water treatment capacity is approximately 500,000m<sup>3</sup> per day.

2007	Jiangyin	Acquisition/30 year TOT	1million, wastewater treatment
------	----------	-------------------------	--------------------------------

In November 2007, Everbright Water (Jiangyin) Limited a JV between CEI and Jianguin's Xin Guo Lian took over four waste water treatment plants in Jiangyin City for CNY624million. CEI holds 70% of the joint venture. The facilities have a total capacity of 190,000m<sup>3</sup> per day and cost CNY201million to upgrade in June 2008 along with CNY267,000 for acquiring the sewerage network.

2009	Jinan	30 year BOT	150,000 wastewater treatment
------	-------	-------------	------------------------------

This is for the fourth wastewater treatment work in the city, with a capacity of 30,000m<sup>3</sup> of wastewater per day. It will cost 72.7million to develop and will enter service during 2010.

2009	Ling Country	30 year BOT	150,000 wastewater treatment
------	--------------	-------------	------------------------------

The facility will enter service during 2010, at a cost of CNY58million, with a capacity of 30,000 m<sup>3</sup> of wastewater per day.

2009	Zibo	20 year BOO	Wastewater reuse
------	------	-------------	------------------

The project aims to enter service at the end of the year, at a cost of CNY55million, providing 400m<sup>3</sup> of reclaimed water per hour (9,600m<sup>3</sup> per day).

#### Contact Details

Name: China Everbright International Limited  
Address: 27<sup>th</sup> Floor, Far East Finance Centre, 16 Harcourt Road, Hong Kong  
Tel: (852) 2804 1886  
Fax: (852) 2528 4228  
Web: [www.ebchinaintl.com](http://www.ebchinaintl.com)

Tang Shuangting (Chairman)  
Chen Xiaoping (CEO)  
Wong Kam Chung Raymond (CFO)

**CHINA WATER GROUP**

Previously called the China Evergreen Environmental Group, China Water Group (CWG) is based in Guangzhou and is held by Evergreen Asset Group Ltd, which is domiciled in the British Virgin Islands. The holding company has four majority-owned subsidiaries, Guangdong Xinxinmei Environmental Protection Co. Ltd., Beijing Haotai Shiyuan Water Purification Co. Ltd., Shandong Haiyang Shenshi Environmental Protection Co. Ltd. and Xianyang Beicheng Water Purification Co. Ltd. The company intends to focus on selling bottled water in the foreseeable future and aims to dispose of its BOT contracts.

<b>YE 31/12 (USDmillion)</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
Turnover	9.37	6.98	4.80	0.00	0.22
Operating profits	1.95	2.41	-6.58	0.00	-1.27
Pre-tax profits	3.62	-0.48	-1.68	-0.29	-0.29
Net profits	3.70	-0.76	-1.50	-1.23	-2.56
Earnings Per Share (USD)	0.00	-0.01	-0.01	-0.01	-0.02

To date, four BOT contracts have either been completed or are in progress. Revenues from BOT contracts were USD250,571 in 2004, USD302,011 in 2005 and USD989,970 in 2006.

The Company has completed the design and construction of over 14 waste water facilities across China with total daily capacity of 120,000m<sup>3</sup>, with three BOT waste water treatment facilities with a total daily capacity of 70,000m<sup>3</sup>. The company currently has a pipeline of 10 BOT and turnkey projects principally in Guangdong Province through Guangdong Xinxinmei Environmental Protection Company and has entered into two arrangements to acquire existing BOT projects in Henan Province with a total processing capacity of 130,000m<sup>3</sup> per day.

<b>BOT contracts</b>	<b>Cost (USDmillion)</b>	<b>Capacity (m<sup>3</sup> per day)</b>	<b>Contract (years)</b>	<b>Operational since</b>
Tianjin Shi Shen	1.09	10,000	20	11-2003
Xinle Shen Mei	4.11	40,000	22	10-2003
Hai Yang City Shen Shi	3.62	20,000	22	06-2005
Han Dan Cheng Sheng	3.53	33,000	22	12-2007

The municipal wastewater treatment facility serving Haiyang City in Shandong Province will generate an average revenue of USD600,000-650,000 per annum over the total project life of 22 years.

A BOT contract in Beijing (Beijing Hao Tai) was sold to a third party in 2006, generating a net profit of USD44,872. No material announcements regarding projects are available about the company's activities post 2006 other than in January 2007, the company decreased its investment in the Handan project from HKD17.86million to HKD7.2million, retaining a 34.32% holding in the project.

**Contact Details**

Name: China Water Group  
Address: 7A01, Baicheng Building, 584 Yingbin Road, Dashi, Panyu District,  
Guangzhou, Guangdong, China  
Tel: 86 20 3479 9768

Pu Chong Liang (Chairman)  
Fang Wenge (CEO)  
Rencai Ding (CFO)

**CHINA WATER AFFAIRS GROUP**

The China Water Affairs Group (CWAG) started operating water and sewage BOT contracts in 2002-03. The company provided 0.5million m<sup>3</sup> per day of water in 2006, serving 1.2million people. CWAG now operates 28 operating units in China providing a total of 440,000m<sup>3</sup> per day of raw water and 3.9million m<sup>3</sup> per day of potable water, serving approximately 8.5million people. Sewage treatment activities include five facilities in operation and up to 75 more in development.

**CWAG, profit and loss account**

<b>FY 31/03 (HKDmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Water provision	15.0	55.9	255.2	379.5	632.5
Water installation	9.3	41.7	128.7	239.0	251.6
Sewage treatment projects	9.1	0.0	26.8	82.3	78.4
Turnover	52.9	140.3	765.4	1,033.2	1,398.2
Pre-tax profit	-20.3	151.7	301.4	326.6	520.1
Net profit	-25.0	102.9	520.0	228.7	444.7

Raw (bulk) water provision contracts (000m<sup>3</sup> per day)

<b>Company</b>	<b>City / Province</b>	<b>Year</b>	<b>Stake</b>	<b>Size</b>
Jiangxi Wannian Silver Dragon Water Affairs	Wannian, Jiangxi	2006	100%	30
Xinyu Water Affairs Group	Xinyu, Jiangxi	2008	60%	150
Guangdong Xinhui Water Affairs	Huizhou, Guangdong	2008	50%	340
Hainan Xing Cheng Xiang Water Supply	Haikou, Hainan	2007	53%	100

Drinking water provision contracts (000m<sup>3</sup> per day)

<b>Company</b>	<b>City / Province</b>	<b>Year</b>	<b>Stake</b>	<b>Size</b>
Yanshan Silver Dragon Water Affairs	Qianshan, Jiangxi	2007	100%	80
Fenyi Silver Dragon Water Affairs	Fenyi, Jiangxi	2007	60%	30
Gaoan Water Affairs	Gaoan, Jiangxi	2007	60%	45
Gaoan Water Affairs II	Gaoan, Jiangxi	2010	60%	80
Xinyu	Xinyu, Jiangxi	2006	60%	130
Xinyu IV	Xinyu, Jiangxi	2008	60%	150
Shangli	Shangli, Jiangxi	2009	60%	20
Wannian	Wannian, Jiangxi	2006	100%	70
Jingzhou Water Supply	Jingzhou, Hubei	2007	51%	715
Jiangling Silver Dragon Water Affairs	Jiangling, Hubei	2007	100%	20
Chongqing Yong Chuan Global Credit Water	Yongchuan, Chongqing	2007	100%	55
Chongqing Yong Chuan II	Yongchuan, Chongqing	2010	90%	10
Sunijiakou	Sunijiakou, Chongqing	2008	100%	30
Ningxiang	Ningxiang, Hunan	2009	100%	95
Wuzhou	Wuzhou, Guangxi	2010	49%	355
Henan Yinlong (Fugou) Water Supply	Fugou, Henan	2006	100%	80
Henan Yinlong (Xihua) Water Supply	Xihua, Henan	2006	55%	80
Zhoukou Silver Dragon Water Affairs	Zhoukou, Henan	2006	70%	137
Henan Luyi Silver Dragon Water Supply	Luyi, Henan	2004	100%	30
Guangdong Renhua Silver Dragon Water	Renhua, Guangdong	2003	73%	30
Huizhou Daya Bay Yiyuan Purified Water	Daya Bay, Guangdong	2008	70%	340
Guangdong Xinhui Water Affairs	Xinhui, Guangdong	2007	50%	440
Zhengcheng	Zhengcheng, Guangdong	2010	16%	150
Foundation Gang-Wu (Changzhou) Water	Wujin, Jiangxu	2007	40%	620

Sewage treatment contracts (000m<sup>3</sup> per day)

<b>Company</b>	<b>City / Province</b>	<b>Year</b>	<b>Stake</b>	<b>Size</b>
Fenyi China Water Environmental Prtn	Fenyi, Jiangxi	2009	53%	10
Wannian	Wannian, Jiangxi	2009	53%	15
Yanshan	Yanshan, Jiangxi	2009	100%	11
Jingzhou China Water Environmental Prtn	Jingzhou, Hubei	2006	100%	100
Huizhou Daya Bay Qingyuan Env Prtn	Daya Bay, Guangdong	2008	70%	150

The company has sought to adjust water tariffs wherever possible.

Tariff (CNY/m <sup>3</sup> )	Pre-	1 <sup>st</sup> chang	2 <sup>nd</sup> change	Date
Jiangxi Wannian Silver Dragon Water Affairs	0.83	1.62		-
Xinyu Water Affairs Group	1.00	1.10	1.55	01-08
Yanshan Silver Dragon Water Affairs	1.13	1.35	N/A	11-09
Fenyi Silver Dragon Water Affairs	1.34	1.63	N/A	10-08
Gaoan Water Affairs	1.21	1.57	N/A	01-09
Jingzhou Water Supply	1.00	1.07	1.32	01-09
Jiangling Silver Dragon Water Affairs	1.35	1.64		08-09
Henan Yinlong (Fugou) Water Supply	1.20	1.43	1.98	12-08
Henan Yinlong (Xihua) Water Supply	1.20	1.30	1.85	12-08
Zhoukou Silver Dragon Water Affairs	1.20	1.38	1.76	04-09
Henan Luyi Silver Dragon Water Supply	1.20	1.43	1.85	01-08
Guangdong Renhua Silver Dragon Water	1.05	1.55	N/A	-
Huizhou Daya Bay Yiyuan Purified Water	2.41	2.94	N/A	05-10
Guangdong Xinhui Water Affairs	1.41	1.68	N/A	12-10

Summary of facilities currently in operation (000m<sup>3</sup> per day)

Segment	Contracts	Capacity	People served
Bulk water	4	620	1,200,000
Potable water	24	3,892	7,500,000
Sewage treatment	5	286	1,000,000

### Jiangxi operations contract

In May 2008, the CWAG entered into a preliminary agreement with Jiangxi Province Administrative Assets Group Company who has granted the Group first right of refusal to operate any of some 80 sewage plants which to be completed in Jiangxi Province before September 2010 with a total daily processing capacity of 1.9million m<sup>3</sup>. This is equivalent to 8-9million people. Phase one will include 45 sewage treatment plants. The first to be completed was the Fenyi plant in April 2009. The estimated total investment for the construction of the sewage treatment plants, piping networks and related facilities is approximately CNY6billion, including CNY3billion for the sewage treatment works.

### China Water Industry Investment Group

This is a strategic alliance with the China Water Industry Investment Corporation (CWIIIC) (81% held by various government bodies and 19% by CWAG) which provides 3.7million m<sup>3</sup> of water per day, along with 2.0m<sup>3</sup> per day via associated companies. CWIIIC has 19 water projects in Xinjiang, Inner Mongolia, Shandong, Beijing, Jiangsu, Sichuan and Zhejiang. In October 2007, China Water Affairs acquired 19.4% of CWIIIC from Shanxi Wanjiashai Yellow River Diversion Project General Company for CNY175million. China Water Industry Investment Corp. was founded in October 2004 as a national investment company focusing on investment, construction and operation of projects for urban water supply, sewage treatment and desalination.

Xinjiang Changyuan Water Resources Industry Group Co Ltd (XCWR), a 60% owned subsidiary of CWIIIC, acquired a 60% interest in Kuerle Huitong Yinquan Water Co Ltd, a water utility company, from Xinjiang Huitong Co Ltd, for CNY78million in 2007. Kuerle Huitong Yinquan Water is engaged in the urban water supply for Korla, Xinjiang Uygur Autonomous Region. Korla has a population of 380,000, up from 40,000 in 1982. Xinjiang Huitong's water revenues were CNY23.1million in 2005 and CNY27.6million in 2006, with part year revenues of CNY12.3million in 2007.

### Contact Details

Name: China Water Affairs Group  
 Address: Suite 6408, 64/F Central Plaza, 18 Harbour Road, Wan Chai, Hong Kong  
 Web: [www.chinawatergroup.com](http://www.chinawatergroup.com)

Duan Chuan Liang (Chairman)  
 Du Lin Dong (CEO)  
 Li Ji Sheng (Director)

**CHINA WATER INDUSTRY GROUP**

The Sky Hawk Computer Group was listed on the Hong Kong Stock Exchange in 2002. Its computer and watch activities were consistently loss making. In 2006 the company moved into the water sector and was renamed the China Water Industry Group. The computer peripherals and TechnoMarine watch activities were either sold or wound up during 2007 in order to concentrate on its water activities. The water activities generated an operating profit of HKD7.9million in 2007.

100% of the Anhui Dang Shan Water Industry Company (serving Danzhou City of Hainan Province) was acquired in 2006 along with 70% of Jining City Haiyuan Water Treatment Company Limited (Hedong District in Shandong Province). In December 2006, CWIG acquired Anhui Dang Shan Water Industry Co Ltd in Anhui Province.

In March 2007, 51% of Yichun Water Industry Company Limited was acquired for CNY30million. The company Provides water and sewerage services in Yichun County, Jiangxi Province. In April 2007, Linyi Fenghuang Water Industry Company Limited, a joint venture between CWIG and Linyi City Hedong District Water Supply Company Limited was established. CWIG acquired 60% of the JV for CNY18million. The JV provides water to Linyi City, Hedong District, Shandong Province. In July 2007, CWIG acquired 51% of the Shangqiu Zhengyuan Water Industry Co. Limited and Linyi Ganghua Water Industry Company Limited for CNY67.5million. That month, CWIG also subscribed CNY21million into the share capital of Jinan Hong Quan Water Company Limited's Jining City Haiyuan Water Treatment Company Limited.

By the end of 2007, the China Water Industry Group (CWIG) had acquired 7 urban water supply enterprises and 4 sewage treatment enterprises in China, with an aggregate water supply capacity of 2.3million m<sup>3</sup> per day and an aggregate sewage treatment capacity of 100,000m<sup>3</sup> per day, providing water supply and sewage treatment services to a population of 4.81million in Shandong, Jiangxi, Henan, Anhui and Hainan provinces.

Letters of intent for joint ventures announced in 2007

2007	Company/project	Water (m <sup>3</sup> /day)	Sewage
April	Shang Qiu City, Henan Province	1,000,000	0
August	Du Yun City, Guizhou Province	100,000	0
August	Suzhou EDZ, Anhui Province	100,000	120,000
October	Linyi City, Shandong Province	1,500,000	600,000

The October letter of intent concerns a 51%-49% joint venture for water supply and sewage treatment plants in Lan Shan District, Luo Zhuang District and the subordinated regions including Tan Cheng County, Cang Shan County, Ju Nan County, Yi Shui County, Meng Yin County, Ping Yi County, Fei County, Yi Nan County and Lin Shu County in Linyi City in Shandong Province.

During 2008, a series of more substantial acquisitions and JVs were made. The June and July JVs are at the letter of intent stage, while the August acquisition is a formal undertaking. In June a joint venture was announced with Shenyang Water Development Limited, covering six water supply projects in Shenyang City. Also in June an 80%-20% JV with the Stated-owned Assets Supervisory Committee of Geermu Municipal Government (also known as Golmud, Qinghai Province) was established. In July, a joint venture was agreed with the Yunfu City Deyu Environmental Protection Company regarding three entities in Guangdong Province. In August, eight projects held by Shenzhen South China were acquired for HKD700million. These have a total water treatment capacity of 180,000m<sup>3</sup> per day and 480,000m<sup>3</sup> per day of wastewater treatment and generated revenues of HKD41million and post-tax profits of 30million in 2007.

The company aims to have a water supply volume of 5-10million m<sup>3</sup> per day and a sewage treatment capacity of 2million m<sup>3</sup> per day by 2010-11. Letters of intent covering 3.02million m<sup>3</sup> per day of water supply and 820,000m<sup>3</sup> per day of sewage treatment capacity have been signed, along with the acquisition already announced in 2008.

Letters of intent and acquisitions announced in 2008

2008	Company/project	Water (m <sup>3</sup> /day)	Sewage
June	Geermu, Qinghai Province	100,000	0

2008	Company/project	Water (m <sup>3</sup> /day)	Sewage
June	Shenyang City	120,000	0
July	Yunan County, Duyuan, Guangdong	0	20,000
July	Yunan County, Yiyuan, Guangdong	0	20,000
July	Yunfu City, Guangdong	100,000	60,000
August	Sihui South China, Shenzhen, 20 year BOT	0	50,000
August	Baoji, Shenzhen, 25 year BOT	0	100,000
August	Sihui Urban, Shenzhen, 30 year BOT	0	30,000
August	Boluo, Shenzhen, 20 year BOT	0	30,000
August	Huidong, Shenzhen, 22 year BOT	0	40,000
August	Huizhou No 4, Shenzhen, 25 year BOT	0	30,000
August	Huizhou No 6, Shenzhen, 22 year BOT	0	30,000
August	Tangshan, Shenzhen	180,000	0

#### China Water Industry Group, profit and loss account

FY 31/12 (HKDmillion)	2005	2006	2007	2008	2009
Water provision	0.0	0.0	24.4	169.8	202.1
Water construction & installation	0.0	0.0	28.4	-	-
Sewage treatment	0.0	0.0	6.8	-	-
Turnover	61.2	39.5	124.4	194.9	211.0
Operating profit	-42.3	-25.2	-4.3	65.7	-334.2
Net profit	-44.2	-25.3	-19.1	43.9	-354.2

2008 & 2009 water provision figures are for all water activities.

#### Contact Details

Name: China Water Industry Group  
Address: Room 1207, 12th Floor, West Tower, Shun Tak Centre  
168-200 Connaught Road Central, Sheung Wan, Hong Kong  
Tel (852) 2547 6382  
Fax (852) 2547 6629  
Web: www.chinawaterind.com

Li Yu Gui (Chairman)  
Yang Bin (CEO)  
Liu Bai Yue (COO)

**CHONGQING WATER GROUP**

The Chongqing Water Group was founded in 2001 and granted a 30 year concession to serve the Chongqing urban area. The company had its IPO in March 2010 placing 12% of its shares on the market, raising CNY3.49billion (USD511million). The company serves water to approximately 15million of the municipality's 30million people and is responsible for nearly all the area's sewerage services. Suez Environnement acquired 15% of the company's equity as part of their cooperation agreement in August 2008 for EUR140million. As of April 2010, the municipality's Chongqing Water Assets Operation Corporation held 75% of Chongqing Water Group, Suez Environnement 13% and Chinese investors, 12%.

For individual contracts with Suez, see company entry.

**Chongqing Water Group, profit and loss account**

<b>FY 31/12 (CNYmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water provision	607.9	539.0	652.4	745.7
Sewage treatment	374.0	1,176.7	1,524.1	1,733.1
Engineering Construction	205.8	168.5	140.9	221.1
Other water facilities	36.5	97.4	52.0	39.5
Turnover	1,183.6	1,959.8	2,357.6	2,713.6
Operating profit	148.0	828.4	991.0	1,073.3
Net profit	98.1	911.6	736.2	1,014.1
Earnings per share	0.02	0.21	0.17	0.24

Funds raised by the IPO and a CNY1.7billion bond issue are to be invested in six water treatment plants with a total 400,000m<sup>3</sup> per day capacity and nine wastewater treatment works with a total capacity of 250,000m<sup>3</sup> per day.

**Contact Details**

Name: Chongqing Water Group  
Address: 1 Long Jia Wan, Yu Zhong District  
Chongqing, Sichuan  
Tel (86) 23 6386 0827  
Fax (86) 23 6386 0827  
Web: www.chinawaterind.com

Wu Xiufeng (Chairman)  
Liu Manglan (President)



**CITIC PACIFIC LTD**

CITIC Pacific is the Hong Kong arm of CITIC, China's leading investment company. It was floated on the Hong Kong Stock Exchange in 1996. 50.5% of the equity is held by private and institutional investors, 29% by CITIC's CITIC Hong Kong and 20.5% by the management.

**CITIC Pacific, profit and loss account**

YE 31/12 (HKDmillion)	2005	2006	2007	2008	2009
Turnover	26,564	47,049	38,534	46,420	46,409
Operating profits	2,838	6,925	8,790	-10,008	5,890
Net profits	3,989	8,272	10,843	-12,687	5,950
Earnings Per Share (HKD)	1.82	3.76	4.90	-5.70	1.63

CITIC sought five water and waste management projects in Shanghai, Hangzhou, Guangzhou and Jiangsu in 2004-05.

**Zunyi**

2004	Zunyi	35 year concession	Water treatment
------	-------	--------------------	-----------------

CITIC Pacific holds 75% of the asset and 25% of the operational companies (CGE (Zunyi) Water Treatment Co., Ltd), with CGDE (Veolia) holding the remaining 25% and 75% respectively. Zunyi is in Guizhou Province. The contract involves acquiring the extant facilities for CNY152million and has a total cost of CNY200million. These consist of the Nanjiao and Beijiao water treatment works, each having a capacity of 100,000m<sup>3</sup> per day. The asset company is to pay the operational company a set of fees up to an annual cap of CNY51million. Citic anticipates a 15% return on its investment in the project.

**Changzhou**

2005	Changzhou	30 year concession	Water treatment
------	-----------	--------------------	-----------------

CITIC holds 24% of Changzhou CGE Water Co., Ltd, which is responsible for treating and distributing water to Changzhou in Jiangsu Province. The four WTWs have a combined capacity of 710,000m<sup>3</sup> per day. It is anticipated that the Jiangsu project will involve a total investment of HKD1billion.

**Kunming**

2006	Kunming	30 year concession	Water treatment
------	---------	--------------------	-----------------

CITIC holds 12.5% of Kunming CGE Water Supply Co., Ltd, which is responsible for treating and distributing water to Kunming, Yunnan Province. The seven WTWs have a combined capacity of 1,115,000m<sup>3</sup> per day.

**Contact Details**

Name: Citic Pacific Limited  
 Address: Citic Tower, 1 Tim Mei Avenue,  
 Central, Hong Kong  
 Tel: 852 2820 2111  
 Fax: 852 2877 2771  
 Web: www.citicpacific.com

Zhenming Chang (Chairman)  
 Jijing Zhang (Managing Director)  
 Vernon Moore (Finance Director)

**EASEN INTERNATIONAL**

Easen International is a Shanghai based environmental management company, which entered the BOT/TOT sector in China in 2007. The company has a number of offices in China and the USA and has specialised in developing strategic alliances with international companies and the regional development institutions.

2007	Yongshun County, Hunan	30 years, BOT	150,000, WWTW
2007	Zhaoan, Fujian	30 years, BOT	300,000, WWTW
2008	Nanjing County, Fujian Province	30 years, BOT	50,000, WWTW

In 2007 and 2008, three wastewater treatment BOT contracts were gained, serving a total of 500,000 people. The contracts were jointly awarded with Spain's Grupo Tradebe. No projects have subsequently been gained.

**Contact Details**

Name: Easen International  
 Address: 3502/4 88 Huichuan Road,  
 Shanghai, PR China 200050  
 Tel: (86-21) 5273 8396  
 Fax: (86-21) 5272 5792  
 Web: [www.easen-group.com](http://www.easen-group.com)

Dr Ping Zhuang (Managing Director)

**GALAXY WATER INC**

The company was previously called Qindao Galaxy, founded in 1988 and was renamed in 2006. It is part of the Galaxy Group, which also has real estate operations. In 2005-2006 a series of wastewater contracts were gained with a total treatment capacity of 320,000 m<sup>3</sup> per day and calling for RMB420million in investments.

Galaxy Water, projects to 2008

City	Population	Activity	Capacity (m <sup>3</sup> / day)	Project
Qingdao, Shandong	133,000	Wastewater	N/A	BOT, 2002
Pingdu Nancun	62,000	Wastewater	20,000	BOT, 2003
Shanxiang, Heze, Shandong	N/A	Industrial WW	40,000	BOT, 2005
Changle	N/A	Industrial WW	50,000	BOT, 2006
Caoxian, Shandong	N/A	Industrial WW	30,000	BOT, 2005
Zucheng, Shandong	220,000	Wastewater	66,000	BOT, 2004
Changde, Hunan	N/A	Industrial WW	150,000	BOT, 2008
Tengzhou, Shandong	150,000	Municipal & Ind WW	60,000	BOT, 2006
Jining Jiada	45,000	Municipal & Ind WW	40,000	BOT, 2004
Jining Hi Tech	N/A	Industrial WW	N/A	BOT, 2006
<b>Group total</b>			<b>937,500</b>	

**Contact details:**

Name: Interchina Holdings Ltd.  
Address: Galaxy Building,  
29 Shandong Road, Qingdao, 266071, China  
Tel: 86 - 532 8584 5376  
Web: [www.galaxywater.cn](http://www.galaxywater.cn)

Shing Lam Cheung (Chairman & CEO)  
Yongjun Zhu (Deputy Chairman)  
Chen Zhang (Director, Finance)

**GLOBAL GREEN TECH GROUP**

Global Green Tech Group (GGTG) is a Hong Kong listed company specialising in a range of cosmetic and surfactant products for domestic and industrial use. Golden Idea is a private biotechnology company in China engaged in the research and development of wastewater treatment systems as well as the design, development, sales and installation of environmental protection equipments other than wastewater treatment. Global Success Properties Ltd, a unit of GGTG, currently owns 8.0% of Golden Idea.

In September 2002, GGTG signed a letter of intent with Golden Idea Bio-technology Engineering Group Ltd and Guangxi Liuzhou City Investment and Construction Development Co., Ltd for a joint investment in two sewage treatment plants. GGTG and Golden Idea are to acquire from Guangxi Liuzhou City Investment the rights for the development and operation of two sewage treatment plants at Liuzhou in China. The development and operation rights will last not less than 25 years, with a proposed investment of USD61.35million. HKD100million was earmarked for expanding the plant in 2002. The total project will cost HKD480million.

The two plants will serve over 800,000 commercial and residential users in the city of Liuzhou. The technology development and construction of these two plants are expected to take two years and the plants are scheduled for the commencement of operations by the end of 2004, although no subsequent announcements have been identified.

**Global Green Tech Group, profit and loss account**

<b>FY 31/12 (HKD million)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	902	847	1,072	1,340	397
Operating profit	278	315	433	149	-271
Net profit	223	197	312	8	-270
Earnings per share (HKDc)	23.2	18.9	26.7	0.6	-13.8

**Contact Details**

Name: Global Green Tech Group  
 Address: Rm 3402-08, 34/F Office Tower Convention Plaza,  
 1 Harbour Road, Wan Chai, Hong Kong  
 Tel: +852 2522-2811  
 Fax: +852 2973-0033  
 Web: [www.globalgreentech.com](http://www.globalgreentech.com)

Chung Wai Yip (CEO)  
 Hiu Tung Wong (CFO)

## GOLDEN STATE

The Golden State Holding Group Corporation was founded in California, USA and entered the Chinese municipal market in 1988. Originally the company exported water hardware to China, before becoming an engineering and consulting company and then an operations company. The company has been involved in over 100 water and wastewater projects in China. The Golden State Environmental Corporation was established in 2004 to develop privately operated facilities including operating 20 water and wastewater treatment plants and waste facilities. Golden State is now established and owned in China. Golden State serves approximately 7.5million people in China, 2.0million with Beijing Enterprises Water, 2.45million via the Agbar joint venture and 1.0million on its own projects.

### Joint ventures in Beijing

In August 2007, Beijing Anling Water Technology Company Limited (50% BEWG, 50% Golden State) acquired the right to finance, invest, design, construct, manage and operate the Beijing No. 10 Water Treatment Plant in Dingfuzhuang, Chaoyang District, Beijing for 23 years. This facility had previously been awarded to AWG (UK) in 2000, but had never reached financial closure. The Plant A plans to have total purified water output capacity of 500,000 m<sup>3</sup> per day. Subject to the government's final approval, the preliminary estimation of the total investment in the Plant A is approximately CNY1.5billion (approximately HKD1.5213billion).

### Joint venture with Agbar

The Agbar Group is operating a series of water supply and wastewater treatment projects in the province of Jiangsu, through a joint venture with Golden State. Fund raising in 2006 and 2007 involved USD190million of financing from four financiers including Agbar and Merrill Lynch. In December 2008, Agbar increased its holding in the Jiangsu Water Group from 49% to 72%.

The joint venture will be responsible for four 30-year concessions: the management of a waste water treatment plant (with capacity of 300,000m<sup>3</sup>/day) in Nanjing; the construction and management of three potable water treatment plants (350,000m<sup>3</sup>/day in total) in Taizhou, raw water provision (200,000m<sup>3</sup>/day) in Taixing and the management of another potable water treatment plant (50,000m<sup>3</sup>/day) and the related distribution network in Xuyi. These facilities serve 1.25million people for water and 1.20million for wastewater.

Golden State acquired AWG's (UK) interest in the 2002 Jiangsu Taizhou project in 2006 for GBP6million. This has a capacity of 200,000 m<sup>3</sup> per day. According to AWG, the facility was designed to serve 630,000 people. The original contract signed with Tiazhou Municipal Water Company in Jiangsu Province in May 2002. Investment will total GBP4.4million in equity and GBP11.2million in local debt. The contract is for bulk water provision under a take or pay agreement, whereby a guaranteed volume of water is to be purchased, generating a turnover of GBP70million for the life of the contract.

### Other projects

Year	Project	Contract	Size (m <sup>3</sup> per day)
2000	Beijing Development Area	BOT	50,000 wastewater
2002	Taicang East City, Jiangsu	BOT	40,000 wastewater
2004	Jiangsu Kunshan North Area	TOT	87,500 wastewater
2005	Qingdao Export Zone, Shandong	BOT	5,000 industrial wastewater
2006	Beijing Daxing Yufa	BOT	5,000 industrial wastewater
2006	Beijing Daxing Yufa	BOT	10,000 industrial water
2008	Jintan No 1	TOT	30,000 municipal wastewater
2008	Jintan No 2	TOT	20,000 industrial wastewater

**Contact Details**

Name: Golden State Holding Group Corporation  
Address: Suite B347, Sunshine Plaza, 68 An Li Road,  
Chaoyang District, Beijing 100101  
Tel: +86 10 64976688  
Fax: +86 10 64929388  
Web: [www.goldenstate.com.cn](http://www.goldenstate.com.cn) / [www.gsegc.com](http://www.gsegc.com)

Peter C Jiang (President)

**GUANGDONG GOLDEN DRAGON DEVELOPMENT INC**

Guangdong Golden Dragon Development was founded in 1997 and is involved in the provision of drinking water and real estate development. During the year ended December 31, 2008, the Company obtained all of its revenue from its drinking water supply business. The Company operates its business mainly in southern China. It is listed on the Shenzhen stock exchange.

**Guangdong Golden Dragon Development, profit and loss account**

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water revenues	N/A	N/A	63	84	82
Revenues	413	250	256	87	155
Operating profits	51	13	-5	7	29
Net profits	3	7	86	21	190
EPS (CNY)	N/A	0.10	0.28	0.07	0.66

**Contact Details**

Name: Guangdong Golden Dragon Development  
Address: No. 1 Jin Long Building, Fangzheng Second Street  
Qing Yuan, GNG 511518, China  
Tel: +86-763-3369393  
Fax: +86-763-3362693  
Web: www.jlhf.com

Zhimao Yang (Chairman)  
Haimei Zhang (CFO)  
Dandan Zhang (Deputy General Manager, Secretary)

**GUANGDONG INVESTMENT LTD**

Guangdong Investment Ltd (GDI) is a property and investment company controlled by the municipality of Guangdong's GDH Limited (58%) and Guangdong Trust (11%). Following heavy losses in 1998 and 1999, the company has been restructured to concentrate on utilities, infrastructure and property. The traditional utility activities were in power generation. In December 2000, GDI acquired 81% of GH Water Supply (Holdings) for HKD3.96billion as part of a refinancing exercise. GH Holdings owns 99% of WaterCo, a company that operates the assets for the transfer of treated bulk water to Hong Kong. WaterCo was corporatised in April 2000 and supplies water to parts of Shenzhen and Dongguan in Guangdong Province along with supplying 75% of Hong Kong's drinking water under a 30 year non-exclusive contract (from August 2000.) This is equivalent to serving 5million people. The latter contract accounts for 90% of WaterCo's revenues. A water piping project (Phase IV renovation project) increased the system's capacity from 1,743million m<sup>3</sup> pa to 2,423million m<sup>3</sup> in 2003 at a cost of CNY4.7billion. GDI's stake in GH has been increased to 89.08% by 2009.

**Guangdong Investment Ltd, profit and loss account**

Y/E 31/12 (HKDmillion)	2005	2006	2007	2008	2009
Turnover from water supply	3,193	3,226	3,193	3,444	3,868
Group turnover	5,249	6,056	6,689	5,913	5,916
Pre-tax profit	1,728	2,048	2,404	2,437	2,959
Pre-tax profits from water supply	719	1,061	1,296	2,511	2,223
Net income	1,304	1,507	1,697	1,877	2,044
Earnings per share (HKD)	0.227	0.250	0.278	0.305	0.330

Under the original agreement, the agreed supply for 1995 was 690million m<sup>3</sup>, increasing by 30million m<sup>3</sup> per annum to the designed maximum capacity of 1,100million m<sup>3</sup> pa by 2008. In return for an interest free loan granted by Hong Kong to Guangdong Province in 1998, the agreed increase in water supply was cut from 30million m<sup>3</sup> per annum to 10million m<sup>3</sup> per annum from 1998.

Year, million m <sup>3</sup> pa	2005	2006	2007	2008	2009
Water to Guangdong	1,225	1,243	1,374	1,366	1,268
Water to Hong Kong	830	517	715	653	725
<b>Total Water Sales</b>	<b>2,045</b>	<b>1,860</b>	<b>2,089</b>	<b>2,019</b>	<b>1,993</b>

**Water to Guangdong, 2008-09**

Million m <sup>3</sup> pa	2008	2009
Water to Dongguan	408	357
Water to Shenzhen	958	911
<b>Total Water Sales</b>	<b>1,366</b>	<b>1,268</b>
Revenues, HKDmillion	2008	2009
Water to Dongguan	131	124
Water to Shenzhen	818	744
<b>Total Water Sales</b>	<b>949</b>	<b>868</b>

In Hong Kong, despite the lowered rate of growth in water deliveries since 1998, demand has continued to be significantly lower than the agreed volume. The Hong Kong Water Supply Agreement for 2006 to 2008 was concluded between the Government of Hong Kong Special Administrative Region and the Guangdong Provincial Government in 2005.

**Contact Details**

Name: Guangdong Investment Ltd  
Address: 28-29/F Guangdong Investment Tower,  
148 Connaught Road, Central District, Hong Kong SAR, China  
Tel: +852 2860 4368  
Fax: +852 2528 4386  
Web: [www.gdi.com.hk](http://www.gdi.com.hk)

Wenyue Li (Chairman)  
Hui Zhang (MD)  
Hon Nam Tsang (CFO)



**GUOZHEN ENVIRONMENTAL PROTECTION**

Guo Zhen Environmental Protection (GZEP, formerly called the Anhui Guozhen Environmental Protection Energy-Saving Technology Company) is owned by the Anhui Guozhen Group Ltd. Co. This is a privately held company based in Anhui Province that has net assets of CNY400million. GZEP has been the lead builder for some 30 wastewater treatment plants and has been involved in the construction of over 200 other wastewater treatment plants.

A total of 10 BOT and TOT contract awards have been identified, the first five of which were generating revenues of approximately USD13million pa in 2005. These contracts serve approximately 6.0million people.

2000: BOT for the Bozhou City Wastewater Treatment Plant with a capacity of 80,000 tonnes/day.

2001: 15 year operating contract for two wastewater treatment plants in Shenzhen City (total city population of 1.285million in 2005).

2001: BOT project in Guangdong Province, the Xinhui East Wastewater Treatment Plant. The wastewater treatment plant serving the Xinhui District of Jiangmen (Guangdong Province) opened in October 2003. The district invested CNY36million (EUR4million) for the land and a supporting network of sewage pipelines. Guozhen is responsible for the WWTW's CNY42million investment and operation. The city has to pay CNY0.67 (EUR0.07) for each tonne of sewage treated, compared with CNY1.2 (EUR0.13) it would have spent if it had conducted its own investing and management. The municipality had estimated that the 80,000m<sup>3</sup> per day WWTW would have cost CNY280million to develop and finance. Xinhui had a population of 735,500 in 2005.

2003: First BOT project in Anhui Province, the Zhuzhuanjing Wastewater Treatment Plant.

2003: 30 year TOT for Xu Zhou wastewater treatment plant with capacity 165,000 tonnes/day (city population of 1.662million in 2005).

2004: 20 year TOT for the Changsha Second Wastewater Treatment Plant with a capacity of 140,000 tonnes/day (city population of 2.051million in 2005).

2005: The management of the Shenzhen Caopu Sewage Treatment Plant was taken over in April. The treatment capacity of Shenzhen Buji Caopu Sewage Treatment Plant is 150,000m<sup>3</sup> per day.

2007: BOT for Lankao County (25,000m<sup>3</sup> per day), Suqian City Yanghe (10,000m<sup>3</sup> per day) and Wuhu City Tranmenshan (Phase1, 60,000m<sup>3</sup> per day).

**Contact Details**

Name: GuoZhen Environmental Protection  
Address: 699 Changjing West Road  
Hefei, Anhui, China  
Tel: 0551-531 9529  
Fax: 0551-532 2901  
Web: www.gzep.com.cn

Jian Xingchao (Chief Engineer)  
Wu Hao (Vice President)  
Ms Duan Zhuan Jian (Chairman)

**HEILONGJIANG INTERCHINA WATER TREATMENT**

The company was founded in 1998 and is principally engaged in water supplying and drainage business, as well as sewage treatment business. The Company operates its businesses primarily in Shaanxi province and Qinghai province, China.

During the year ended December 31, 2009, the Company supplied 31.01million m<sup>3</sup> of water, and treated approximately 13.92million m<sup>3</sup> of sewage. As of December 31, 2009, the Company had four subsidiaries, all of which were involved in potable water supply and sewage treatment.

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover - Water	N/A	N/A	N/A	65	62
Turnover - Sewage	N/A	N/A	N/A	10	9
Turnover	0	5	1	87	85
Operating Profit	-354	10	535	-137	0
Net Profit	-357	8	559	38	20
EPS (CNY)	-1.09	0.02	1.71	0.12	0.06

The company is 70% held by the Black Dragon Group, which is in turn wholly controlled by Interchina Holdings (see company entry).

**Contact details:**

Name: Heilongjiang Interchina Water Treatment Co., Ltd.  
Address: No. 27 Changqing Road, Longsha District  
Qiqihaer, Heilongjiang 161005, China  
Tel: (452) 598-2130  
Web: [www.equitynet.com.hk/interchina](http://www.equitynet.com.hk/interchina)

Yongjun Zhu (Chairman)  
Yukang Xie (CFO)  
Dayong Shi (Deputy General Manager)

**INTERCHINA HOLDINGS**

The company was founded in 1998 and is principally engaged in water supplying and sewage treatment activities. Its principal operating subsidiary is Heilongjiang Interchina Water Treatment which provided 25% of 2009 group revenues and 46% of 2010 group revenues. The company had ten projects six at the operating stage and four under construction. In mid 2010 the company anticipated operational and contracted capacity to rise to 1.3million tonnes per day during 2010-11 and to 10million tonnes per day by 2014-16.

Y/E 31/03 (HKD million)	2006	2007	2008	2009	2010
Turnover – Water & WW contract operation	N/A	N/A	N/A	81.5	139.9
Turnover – Water & WW construction	N/A	N/A	N/A	0.0	72.0
Turnover	146.6	132.0	103.0	116.2	234.8
Operating Profit	-83.7	-7.7	7.1	-365.9	126.3
Net Profit	-92.8	-16.8	-40.7	-764.2	-60.4
EPS (HK cents)	NA	NA	NA	-37.91	2.84

## Projects – In operation

City and province	Stakeholding	Activity	Capacity (tonnes / day)	Project
Qinhuangdao, Hebei	100%	Wastewater	120,000	20 yr TOT, 2002
Maanshan, Anhui	100%	Wastewater	60,000	22 yr BOT, 2006
Changli, Hebei	100%	Wastewater	40,000	30 yr BOT, 2005
Hanzhong Xingyuan, Shannxi	100%	Water	110,000	30 yr TOT, 2008
Yanliang, Shannxi	99%	Water	120,000	20 yr TOT, 2008
Xiongyue, Qinghai	95%	Wastewater	42,500	25 yr TOT, 2005
<b>Sub-total</b>			<b>492,500</b>	

## Projects – Under construction

City and province	Stakeholding	Activity	Capacity (tonnes / day)	Project
Hanzhong Xingyuan, Shannxi	80%	Water	100,000	Mid 2011
Ordos, Inner Mongolia	100%	Water & WW	35,000	3Q 2010
Dongying, Shandong	55.4%	Water & WW	150,000	4Q 2010
Taiyuan Haofeng, Shanxi	80%	Wastewater	160,000	4Q 2010
<b>Sub-total</b>			<b>455,000</b>	
<b>Group total</b>			<b>937,500</b>	

**Contact details:**

Name: Interchina Holdings Ltd.  
Address: Room 7091, 7/F., Aon China Building  
29 Queen's Road, Central, Hong Kong  
Tel: (452) 598-2130  
Web: [www.equitynet.com.hk/interchina](http://www.equitynet.com.hk/interchina)  
www.interchina.com.hk

Shing Lam Cheung (Chairman & CEO)  
Yongjun Zhu (Deputy Chairman)  
Chen Zhang (Director, Finance)

**HONG KONG & CHINA GAS AND LIGHT**

Hong Kong & China Gas and Light (Towngas) is a Hong Kong based power utility which has recently embarked on an investment programme in China resulting in 25 joint venture projects to date. Towngas' Han Yan Water gained three water contracts in China in 2005 these contracts cover 700,000 customers, some 1.8million people in total. These are for Tianjin, Wujiang (Jiangsu province) and in Wuhu (Anhui province) along with managing an integrated water supply and wastewater joint venture in Suzhou Industrial Park, Suzhou, Jiangsu province. Water revenues were HKD209.6million in 2006 and HKD313.1million in 2009.

In July 2005, Towngas agreed to pay CNY776million for an 80% stake in Wujiang Water Investment Company in Jiangsu province. This involves a total investment of CNY950million for a 30 year concession for supplying water to the Wujiang administrative zone. The first phase of the project with Towngas, expected to be completed this year, will involve CNY600million, with a treatment capacity of 330,000m<sup>3</sup> per day, with the capacity rising to 530,000m<sup>3</sup> per day. Water is currently supplied to 180,000 households in Wujiang, a city with a population of 780,000. Water consumption in 2005 was forecast at 115million m<sup>3</sup>, while demand for water in Wujiang has grown at 20% per annum since 2001.

In June 2005 Towngas gained a 75% stake in a water supplier in Anhui province for CNY225million. The 30 year CNY700million concession is for part of the city of Wuhu, which has a total population of 2.25million, with the utility supplying 85million m<sup>3</sup> of water in 2005.

The Suzhou Industrial Park (50% held by Towngas) wastewater treatment plant entered service in 2009 with a capacity of 150,000m<sup>3</sup> per day which will rise to 300,000m<sup>3</sup> per day when fully operational. Total investment will be CNY3,685million.

Towngas, profit & loss account

<b>Y/E 31/12 (HKDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Group turnover	9,351	13,465	14,225	12,352	12,351
Pre-tax profits	5,922	5,890	10,308	4,957	6,056
Net profits	5,281	5,862	9,270	4,303	5,175
Earnings per share (HKD)	0.95	0.88	1.39	0.65	0.79

**Contact Details**

Name: Hong Kong & China Gas Company Ltd  
 Address: 23rd Floor, 363 Java Road, North Point,  
 Hong Kong  
 Tel: (852) 2963 3483  
 Fax: (852) 2516 7368  
 Web: www.towngas.com

Lee Shau Kee (Chairman)  
 Alfred Chan Wing Kin (CEO)  
 John Hon-Ming Ho (CFO)  
 James Kwan Yuk Choi (COO)

**JIANGXI HONGCHENG WATERWORKS CO**

The Jiangxi Hongcheng Waterworks Co was founded in 2001 and partly floated on the Shanghai Stock Exchange in June 2004. The IPO raised CNY264million, CNY256million of which was used to three projects designed to expand the water supply network capacity from 900,000m<sup>3</sup> per day to 1.2million m<sup>3</sup> per day by 2007. Electricity accounted for 38% of its production costs in 2003. Water is charged at CNY0.553 per m<sup>3</sup> and has been fixed at this level for some years, with limited scope for further increases. The company is responsible for 85% of Nanchang's water supplies.

During 2005, the company supplied approximately 279.56million m<sup>3</sup> of water from its Qingshan, Changyang, Xiazheng Street, Niuhang and Changling water plants. In 2007, 304.3million m<sup>3</sup> of water was supplied and 21.0million m<sup>3</sup> of sewage was treated. In 2009, 293.2million m<sup>3</sup> of water was supplied and 54.9million m<sup>3</sup> of sewage was treated.

In 2005, the Company acquired a 51% stake in an environmental protection company that has an exclusive right to operate a Jiujiang-based company engaged in the treatment of waste water. By 2009, operations had expanded to Pingxiang in Jiangxi and Wenzhou in Zhejiang province.

**Jiangxi Hongcheng Waterworks Co, profit and loss account**

<b>Y/E 31/12/(CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – water	152.6	168.0	170.5	163.9	164.2
Turnover – sewage	0.0	2.5	12.1	26.4	38.2
Turnover	152.5	170.5	182.7	190.2	203.4
Operating Profit	43.2	43.3	45.7	30.2	29.9
Net Profit	27.3	28.9	29.4	20.7	21.0
EPS (CNY)	0.20	0.21	0.21	0.15	0.15

**Contact Details**

Name: Jiangxi Hongcheng Waterworks Co  
Address: 98 Guanyin Road  
Nanchang, Jiangxi, 330001 China  
Tel: 86 791 521 0336  
Fax: 86 791 522 6672  
Web: [www.jxhcsy.com](http://www.jxhcsy.com)

Mao Mujin (Chairman)  
Liu Zhong (President)  
Li Xuelang (Deputy General Manager, Director)

**MING HING WATERWORKS HOLDINGS LIMITED**

Ming Hing Waterworks is the first Hong Kong based company that integrates waterworks, technology, engineering and investment management. It was founded in 1967 and is listed on the Hong Kong Stock Exchange. Ming Hing Waterworks is principally engaged in the provision of maintenance and construction works on civil engineering contracts and is currently accountable for maintaining the water supply system for over 55% of the Hong Kong population under a series of short to medium term contracts. Since 2007, the company has been developing its presence in China.

Ming Hing Waterworks, profit and loss account

Y/E 31/12 (HKDmillion)	2005	2006	2007	2008	2009
Waterworks engineering	N/A	N/A	520	641	631
Water supply	N/A	N/A	0	8	30
Revenues	207	264	520	648	661
Operating profits	44	48	46	37	15
Net profits	36	39	34	25	6

In August 2007, the company acquired Hunan Province Ningxiang County Water Supply Company, in Changsha, Hunan which serves the population over 210,000. This project was sold to China Water in December 2008.

Ming Hing established in January 2008 a strategic alliance with China Water Affairs and formed a 60% Ming Hing/ 40% China Water joint venture which will initially manage both parties' water assets in the PRC including over 30 water treatment and sewage plants, covering over 20 cities with a distribution network of over 9,000km of pipes for more than 10,000,000 people. The joint venture will also participate in the building of sewage plants, pipeline extension projects.

In May 2008, the company purchased 83.33% of the equity of a Joint Venture providing drinking water services via a water treatment plant and 40 Km distribution network in the Jiangkou Administration Area, Feilaxia Town, and Qingyuan City, Guangdong. This serves 80,000 people and population in the area. After a CNY13million capital injection, the facility's treatment capacity has been upgraded from 10,000m<sup>3</sup> per day to 30,000m<sup>3</sup> per day.

**Contact Details**

Name: Ming Hing Waterworks  
 Address: Units 1809-1812 Telford House 16  
 Wang Hoi Road,  
 Kowloon Bay, Hong Kong  
 Tel: +852 2380 8265  
 Fax: +852 2397 5975  
 Web: www.minghing.com.hk

Chow Ming Yuen (Chairman)  
 Chi Man Cheung (CFO)  
 Wai Keung Yuen (CEO)

**NANHAI DEVELOPMENT COMPANY LIMITED**

Nanhai Development Company Limited (NDC) was founded in 1992 and supplies drinking water and designs and installs water supply systems in Nanhai and surrounding areas in Guangdong Province. NDC also has a 60% interest in a water provision company based in Jiujiang, Jiangxi Province. The company was listed on the Shanghai Stock Exchange in December 2000. 36.5% of its equity is held by the Nanhai Water Supply Group. The municipality of Nanhai has 1.10million people. The company seeks to raise water supply to 1.32million m<sup>3</sup> per day. In 2009, the Company supplied a total of 338.66million m<sup>3</sup> of water against 274.13million m<sup>3</sup> in 2005, along with treating 42.32million m<sup>3</sup> of wastewater.

**Nanhai Development Company Limited, profit and loss account**

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Water supply	308.6	327.0	356.8	359.7	377.3
Turnover – Sewerage	N/A	N/A	27.8	33.1	47.9
Total turnover	318.9	367.6	411.9	423.9	465.2
Operating profit	129.1	142.0	151.0	129.3	117.1
Net profit	77.5	86.3	92.9	95.8	103.6
EPS (CNY)	0.29	0.32	0.34	0.35	0.38
DPS (CNY)	0.19	0.15	0.14	0.14	0.15

In 2007, the company invested CNY59million in upgrading the Pinzhou Sewage Treatment Project, which it will operate for 24 years. Capacity will rise from 42,500m<sup>3</sup> per day at the outset to 50,000m<sup>3</sup> per day from 2010.

**Contact Details**

Name: Nanhai Development Company Limited  
Address: 21<sup>st</sup> Floor Jianhang Building,  
Guicheng Nanhai Avenue,  
Nanhai District, Foshan, Guangdong, 52820 China  
Tel: +86-757-8628-0996  
Fax: +86-757-8623-8565  
Web: [www.nhd.net.cn](http://www.nhd.net.cn)

He Xiangming (Chairman)  
Feng Chenggui (President)  
Chen Huixia (Finance Director)

**NINGBO FUDA COMPANY LIMITED**

Ningbo Fuda Company Limited (Fuda) was founded in 1993 and is a consumer electronics company, which is also involved in water distribution. In 2005, Fuda supplied 155million m<sup>3</sup> of drinking water, which rose to 164million m<sup>3</sup> in 2007.

<b>Y/E 31/12/(CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover - Water	119.3	122.7	123.8	115.3	24.6
Turnover	1,080	1,453	1,417	2,083	1,503
Operating Profit	41	90	80	275	358
Net Profit	23	41	42	171	229
EPS (RMB)	0.05	0.01	0.10	0.12	0.16

**Contact Details**

Name: Ningbo Fuda Company Limited  
 Address: No.355 Yangming West Road  
 Yuyao, Zhejiang 315400 China  
 Tel: +86-574-628-14275  
 Web: www.fuda.com

Hongxiang Wang (Chairman)  
 Zhongxin Lu (President)  
 Guohua Zhou (Finance Director)



**NWS HOLDINGS LTD**

NWS Holdings Ltd (NWS) is the Hong Kong Stock Exchange listed services arm of the New World Development Company. The company was listed on the HKSE in 1997. NWS has been involved in the water sector in China since 1993 through Sino French Holdings (Hong Kong), its 50-50 joint venture with Suez Ondeo. Total water and wastewater treatment capacity at the start of 2004 was 3.95million m<sup>3</sup> per day, rising to 5.72million m<sup>3</sup> per day by the end of 2007 with 21 water projects, and 23 projects with a capacity of 6.80million m<sup>3</sup> per day in 2009. Operating profit of NWS's water activities were HKD80.6million for 2005, rising to HKD87.4million in 2006 and HKD102.2million in 2007. In April 2008, NWS & Suez Environnement paid EUR140million for 15% of Chongqing Water Group. CWG owns and operates 32 water treatment works and 35 sewage treatment works in Chongqing and aims to expand its services into neighbouring areas.

**NWS Holdings Ltd, profit and loss account**

<b>YE 31/06 (HKDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	10,286	12,544	15,047	18,890	17,251
Operating profits	1,954	650	818	1,331	1,251
Net profits	2,886	1,657	2,005	3,837	2,529
Earnings Per Share (HKD)	1.60	0.89	1.01	1.89	1.23

**NWS Holdings' attributable interest (%)**

<b>Project</b>	<b>Capacity (m3 per day)</b>	<b>NW stake</b>	<b>Contract expiry</b>	<b>Region</b>
Macau Water Plant	330,000	42.5	2030	Macau
Zhongshan Tanzhou Water Plant	60,000 (Phase I) 90,000 (Phase II)	29	2027	Guangdong
Zhongshan Dafeng Water Plant	200,000 (Phase I) 300,000 (Phase II)	33.06	2020	Guangdong
Zhongshan Quanlu Water Plant	500,000	33.06	2020	Guangdong
Dongguan Microfiltration Equipment Plant	N/A	25	2014	Guangdong
Nanchang Water Plant	50,000 (Phase I) 50,000 (Phase II)	25	2023	Jiangxi
Baoding Water Plant	260,000	27.5	2020	Hebei
Siping Water Plant	118,000	25	2030	Jilin
Zhengzhou Water Plant	360,000	25	2031	Henan
Xinchang Water Plant	100,000	25	2032	Zhejiang
Changtu Water Plant	50,000	35	2029	Liaoning
Panjin Water Plant	110,000	30	2032	Liaoning
Shanghai Spark Water Plant	100,000	25	2031	Shanghai
Shanghai SCIP Water Plants	Wastewater - 50,000 Industrial Water - 200,000 Demineralised Water - 4,800	25	2052	Shanghai
Qingdao Water Plant	543,000 (Phase I) 183,000 (Phase II)	25	2027	Shandong
Chongqing Water Plant	380,000 (Phase I) 160,000 (Phase II)	30	2052	Chongqing
Sanya Water Plant	235,000	25	2033	Hainan
Tanggu Water Plant	310,000	25	2039	Tianjin
Changshu Water Plant	675,000 200,000 (Phase II)	24.5	2036	Jiangsu
Chongqing Tangjiatuo Waste Water Plant	300,000	50	2036	Chongqing
Chongqing Yue Lai Water Plant	200,000	24	2038	Chongqing
Qinhuangdao Changli Water Plant	72,000	40	2029	Hebei

Project	Capacity (m3 per day)	NW stake	Contract expiry	Region
Chongqing Changsou Chemical Ind Park	Water – 240,000 Wastewater – 40,000	26%	2050	Chongqing

**Contact Details**

Name: NWS Holdings Ltd  
Address: New World Tower 2, 18 Queen's Road,  
Central, Hong Kong  
Tel: 852 2131 0600  
Fax: 852 2131 0611  
Web: [www.nwsh.com.hk](http://www.nwsh.com.hk)  
[www.sinofrench.com](http://www.sinofrench.com)

Henry Cheng Kar Shun (Chairman)  
Tak Wing Chow (CFO)

**QIANJIANG WATER RESOURCES**

Qianjiang Water Resources Development Co (QWRD) is a municipally based company founded in 1998 providing water supply to Qianjiang City in Zhejiang Province (1999 population 313,000). QWRD had its IPO on the Shanghai Stock Exchange in October 2000. Water sales in 2005 were 96.09million m<sup>3</sup>.

<b>Y/E 31/12/ (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
	110	135	179	237.6	302.6
Turnover	245	385	387	388	623
Operating Profit	32	64	54	68	86
Net Profit	22	18	34	52	54
EPS (CNY)	0.08	0.06	0.12	0.18	0.19

In July 2008, the company acquired 70% of Lishui Water Supply and Drainage Company, from the Assets Supervision and Administration Commission of the city for CNY94.421million. Lishui City has a population of 2.5million at the prefecture level.

**Contact Details**

Name: Qianjiang Water Resources  
 Address: 3 Santai Shan Road, Hangzhou,  
 Zhejiang, China  
 Tel: +86-571-8797-3466  
 Fax: +86-571-8797-4400  
 Web: www.qjwater.com.cn

He Zhonghui (Chairman)  
 Zhang Disheng (Vice Chairman, President)  
 Wang Zhaohui (CFO)

**SHANGHAI INDUSTRIAL HOLDINGS**

Shanghai Industrial Holdings Limited (SIHL) is a broadly based infrastructure, logistics and technology company, which is 58% held by the Shanghai municipal government. The company was partly floated on the Hong Kong Stock Exchange in 1996. In 2003, the company decided to enter the Chinese water and sewage treatment BOT market. The company originally planned to invest a total of CNY10billion by 2006 in operating water supply, sewage treatment and sewerage networks, with the objective of becoming one of the top three water services companies in the Chinese market. By the end of 2007, the company had HKD5.2billion in water and wastewater assets.

**Shanghai Industrial Holdings, profit and loss account**

<b>YE 31/12 (HKDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Total turnover	6,025	6,851	8,342	7,542	6,918
Operating profits	1,246	1,639	2,140	2,528	3,178
Net income	1,028	1,258	1,963	2,102	2,860
Earnings per share (HKD)	1.07	1.30	1.94	1.96	2.65

In August 2003, SIHL formed a CNY500million 50:50 joint venture with the state-held China Energy Conservation Investment Corporation (CECIC), now called General Water of China Co. The joint venture's China Water and Sewage Treatment Company and Zhong Huan Water Treatment Construction Limited Corporation started operations in November 2003. China Water and Sewage Treatment subsequently signed heads of agreements with Xiamen Water Services Group and Zhenjiang New Area Administrative Commission in Jiangsu province for water services investment projects. Total investment in the two projects will exceed CNY1billion.

By the end of 2007, General Water of China had 14 project companies in nine provinces with a total daily capacity of 4,543,000m<sup>3</sup> per day with total assets of HKD5,200million in 2007. By the end of 2009, the capacity had fallen to 4,283,000m<sup>3</sup> per day after the sale of their activities in Chongqing for CNY260million in 2009 (280,000m<sup>3</sup> per day) and the gaining of a second contract in Suifenhe (20,000m<sup>3</sup> per day) in 2009.

The Xiamen GWC Sewage and Wenzhou GWC Zhengyuan have been completed and are in operation, while the projects held by General Water of China (Chongqing) Co. Ltd. and General Water of China (Huzhou) Co. Ltd. were put into trial operation in the second half of 2007. Revenues of Xiamen GWC Sewage and Wenzhou GWC Zhengyuan were HKD233million and HKD41.78million respectively in 2007. The projects held by General Water of China (Wenzhou) Co. Ltd. and General Water of China (Shenzhen) Co. Ltd. entered service in 2008. Preliminary works for the City Water supply project in Suifenhe, commenced in the first half of 2007 and completion and commencement of production are expected in 2010.

<b>Projects</b>	<b>Stake</b>	<b>Investment (CNYmillion)</b>	<b>Capacity (m<sup>3</sup>/day)</b>	<b>Operation period</b>
Xiamen GWC Water Supply Ltd, Fujian	45%	105	1,200,000	30 years, 2006
Xiamen GWC Sewage Treatment Ltd	55%	356	818,000	30 years, 2006
Bengbu Water Supply Company, Anhui province	60%	155	430,000	30 years
Xiangtan Water Supply Company, Hunan province: Water Sewage treatment	70% 100%	140	425,000 100,000	30 years
Eastern Huzhou Water Sewage Treatment, Zhejiang province (BOT)	100%	90	50,000	22 years
Changshou Chemical Industrial Zone, Chongqing (BOO), Water Sewage treatment	100%	589	240,000 40,000	50 years
Yinshi Guo Wei Water Supply Co, Xianyang, Shaanxi province	50%	85	180,000	30 years, 2007
Xianyang Water Supply Project (re-routing of water distribution, BOT)	100%	568	300,000	30 years, 2010
Longhua Sewage Treatment, Shenzhen province (BOT)	90%	160	150,000	22 years, 2006
Huzhou Water Supply Project (BOT), Zhejiang province	100%	824	200,000	34 years, 2010

Projects	Stake	Investment (CNYmillion)	Capacity (m <sup>3</sup> /day)	Operation period
Eastern Wenzhou Sewage Treatment, Zhejiang province	100%	203	100,000	27 years, 2007
Central Wenzhou Sewage Treatment, Zhejiang province	70%	N/A	200,000	N/A
Suifenhe water supply, Wuhua Mountain, Heilongjiang province	100%	N/A	110,000	N/A
Xiangtan, sewage treatment, Hunan	100%	N/A	100,000	N/A

China Water and Sewage Treatment have in turn set up a joint venture with the Xiamen Water Services Group to operate the principal water supply and sewage treatment facilities in Xiamen. The city is one of China's five Special Economic Zones and contract covers a water supply capacity of 1.0million m<sup>3</sup> per day and a sewage treatment capacity of 514,000m<sup>3</sup> per day. Capacity for these two projects were increased to 1,200,000m<sup>3</sup> per day and 559,000m<sup>3</sup> per day respectively during 2007.

A second joint venture has been formed with the Zhangjiang New Area Administrative Commission in Jiangsu Province for the exclusive right to operate water supply and sewage treatment facilities in Zhenjiang New Area. China Water and Sewage Treatment sought to invest by 2006 a total of CNY250million in a 100,000m<sup>3</sup> per day waterworks BOT project, a 60,000m<sup>3</sup> per day sewage treatment plant TOT (Transfer-Operate-Transfer) and BOT project, and a sewerage network project for water supply and sewage collection in the Zhanjiang New Area.

#### Contact Details

Name: Shanghai Industrial Holdings Ltd.  
Address: Harcourt House, 39 Gloucester Road,  
Hong Kong, HK  
Tel: 00852 2529 5652  
Fax: 00852 2529 5067  
Web: [www.sihl.com.hk](http://www.sihl.com.hk)  
Web: [www.cecic.com.cn](http://www.cecic.com.cn)

Yi Long Teng (Chairman)  
Cai Yu Tian (CEO)

**SHANGHAI CHENGTUO HOLDING CO LTD**

Shanghai Chengtou, formerly the Shanghai Municipal Raw Water Co., Ltd. (SMRW) was founded in 1992 and abstracts water from the Yangtze and Huangpu rivers for treatment at the Shanghai municipality's water treatment stations. The company builds and operates the pumping stations, canals and reservoirs necessary for the bulk water provision to the city. 52% of SMRW's shares are held by the Shanghai State Assets Management Bureau. The Company had six subsidiaries and major associates. The company is also involved in waste collection, treatment and landfilling and waste-to-energy projects.

During 2005, SMRW supplied approximately 1.7billion m<sup>3</sup> of water and treated a further 0.6billion m<sup>3</sup> of wastewater. In addition, SMRW supplies bulk water to Veolia Water's 2002 Shanghai Pudong contract. During 2007, the company supplied 1.258billion m<sup>3</sup> of raw water and 0.177billion m<sup>3</sup> of treated water and treated approximately 0.621billion m<sup>3</sup> of wastewater. Sales of water and wastewater accounted for 44% and 23% of total 2007 revenues respectively.

Water price rises granted in June 2009 to its Shanghai Waterworks Minhang increased revenues by CNY7million in 2009 and an anticipated CNY15million in 2010.

**Shanghai Chengtou, profit and loss account**

<b>YE 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water treatment turnover	N/A	N/A	1,202.9	1,174.2	1,264.5
Total turnover	1,010.6	1,198.1	2,488.1	3,214.9	3,358.7
Operating profits	618.4	428.2	535.2	661.4	726.8
Net income	391.1	597.9	773.0	1,270.9	761.1
Earnings per share (CNY)	0.20	0.32	0.34	0.55	0.33

**Contact Details**

Name: Shanghai Chengtou Holding Co. Ltd.

Address: 10/F, 389 Jiangsu Road,  
Shanghai, 200050, China.

Tel: +86 21 5239 7000

Fax: +86 21 6211 7400

Web: [www.sh600649.com](http://www.sh600649.com)

Qingwei King (Chairman)

Hongjun An (President)

Shanggan Wan (CFO)

**SHANGHAI URBAN CONSTRUCTION GROUP**

China's largest wastewater treatment BOT project, Shanghai Zhuyuan No.1 WWTP, with a capacity of 1.7million m<sup>3</sup> per day was originally awarded to Shanghai Youlian Development Company (45%), Huajin Information Investment (40%) and Shanghai Urban Construction Group (15%) in 2002. This group in turn gained the tender for Zhuyuan No.2 WWTP project in 2004. Shanghai Youlian subsequently withdrew from the two WWTP projects due to the changed financing policies in China. In 2005 Shanghai Urban Construction Group won Zhuyuan No.2 tender and was awarded a twenty-five year concession. At the end of the concession, the facility will be handed over to the Shanghai Chengtou Corporation.

The Zhuyuan No.2 Sewage Treatment Plant will cost CNY600million and has a design capacity of 500,000m<sup>3</sup> per day and will mainly deal with sewage from the northern part of the city, such as Yangpu District. Construction started in late 2005 and was continuing in 4Q 2007. Treated sewage from the facility will reach Level 2 of the state sewage discharge standard, above that of most local facilities. The project is to be supported in part through a World Bank loan of USD200million for various urban environmental projects in the city. The original bid by Shanghai Youlian Group was the lowest with a price of CNY0.299 per tonne.

**Contact Details**

Name: Shanghai Urban Construction Group  
Address: 654 Mengzi Road,  
Shanghai, 200085, China.  
Tel: +86 21 630 17388 0086  
Fax: +86 21 630 18245  
Web: [www.sucgcn.com](http://www.sucgcn.com)

Zhu Jiexiang (Chairman)  
Zhu Renwei Jiang Xianfu (Vice Chairman)  
Chen Jinzhang (Chief Financial Supervisor)

**SHANGHAI YOUNG SUN INVESTMENT CO LTD**

Shanghai Young Sun Investment Co., Ltd. was founded in 1995. It owns and operates three sewage treatment plants in Shanghai, with an aggregated daily treatment capacity of 145,000m<sup>3</sup> per day. These activities effectively account for the company's revenues. It also has two subsidiaries and one affiliate, of which one is in Shanghai, providing consulting services of urban infrastructure investment, operation and management, and two based in Shanghai and Chengdu, Sichuan Province, engaged in water treatment business.

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	50.8	109.2	185.9	188.9	N/A
Operating Profit	23.6	40.8	17.3	13.3	N/A
Net Profit	32.7	36.9	12.3	9.4	N/A
EPS (CNY)	0.13	0.15	0.05	0.04	N/A

**Contact Details**

Name: Shanghai Young Sun Investment Co., Ltd.

Address: Block C, Building 10 555 Xu Jiahui Road,  
Shanghai, 200023, China.

Tel: +86 21 639 01001

Fax: +86 21 639 01001

Xu Fei (Chairman)

Liu Zhengqi (CFO)

Zhang Chunming (General Manager)



**SHENZHEN KONDARL (GROUP) CO LTD**

Shenzhen Kondarl (Group) Co., Ltd. was established in 1979. Its chief activity is in food production. In 2005 and 2007, 17% of its million revenues came from water distribution, compared with 19% in 2006.

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover - water	136.4	142.3	150.4	158.4	160.2
Turnover	862.3	751.1	858.6	945.7	1,435.6
Operating Profit	0.8	-51.5	31.8	10.4	100.1
Net Profit	-112.6	-126.7	24.3	36.1	45.8
EPS (CNY)	-0.29	-0.32	0.06	0.09	0.12

**Contact Details**

Name: Shenzhen Kondarl (Group) Co., Ltd.

Address: Level 2, Ji Hao Building No. 1086 Shen Nan East Road  
Luo Hu District, Shenzhen, SHZ 518003

Tel: +86-0755-254-25020

Fax: +86-0755-254-20155

Web: [www.kondarl.com](http://www.kondarl.com)

Luo Aihua (Chairman and President)

Zhu Wenxue (CFO)

**SICHUAN GUANGAN AAA PUBLIC CO LTD.**

Sichuan Guangan AAA Public Co., Ltd. (SG AAA) was established in 1999. The company operates hydroelectric generation and distribution services and distributes water in part of Sichuan Province, including Guang'an City and Nanchong City in Sichuan and Yuechi County and Huaying in Yunnan. In 2005, the company sold 10.7million m<sup>3</sup> of water, rising to 23.9million m<sup>3</sup> in 2009.

<b>Y/E 31/12/ (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover - Water	N/A	N/A	33.6	38.2	45.4
Turnover	260.2	392.2	461.2	569.9	615.2
Operating Profit	72.5	71.5	56.6	92.3	103.2
Net Profit	30.4	29.5	15.5	36.1	48.2
EPS (CNY)	0.15	0.15	0.08	0.15	0.20

In November 2007, the company announced that it was acquiring Sichuan Linshui Aizhong Water Co Ltd, a water utility company, from Chinese state-owned Sichuan AAA Investment Holding Group Co Ltd (SA). Previous to this, SG AAA held 10% of SLAW's equity. Along with acquiring Sichuan Wusheng Aizhong Water Co Ltd and two gas companies, the transactions are worth CNY89million.

**Contact Details**

Name: Sichuan Guangan AAA Public Co., Ltd  
Address: 86 North Qujiang Road  
Guangan District, Guangan, Sichuan 638001  
Tel: +86-826-298-3059  
Fax: +86-826-298-3358  
Web: www.sc-aaa.com

Luo Qinghong (Chairman)  
He Tulin (CFO)  
Chen Yunhai (President)  
Li Mingping (Party Secretary)

**SOUND GLOBAL LTD**

Sound Global (also called Sound Environmental Resources) is based in Singapore and was previously called Eguard Resources Development having been established in 1993 as the Beijing Sound Group. It is chiefly involved in developing and operating solid waste management projects, along with some urban water supply and wastewater treatment services in Hubei. It was partly listed on the Shenzhen It stock exchange and remains majority held by Sound Group. The majority of projects are operated under Epure International, the company's Singapore listed subsidiary (see company entry for details).

**Eguard - Sound Environmental Resources**

<b>YE 31/12 (CNYmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Water	4.1	7.4	11.8	65.2
Turnover – Sewerage	11.2	11.5	79.5	135.0
Turnover	226.1	344.4	515.3	676.2
Operating profits	59.6	116.4	165.3	210.2
Net profits	47.4	86.6	111.3	145.7
Earnings Per Share (CNY)	0.16	0.31	0.28	0.35

CNY606million of 2009 revenues were in Central China, CNY44million in Beijing and CNY26million in Jiangzhe.

Eight of Sound's wastewater projects and four drinking water projects are included under Eguard. These serve approximately 3.76million people, 1.46million for water and 3.30million for wastewater.

N/A	Nanchang	N/A	450,000, wastewater
-----	----------	-----	---------------------

The CNY185million Jiangxi Nanchang Xiang Lake Wastewater Treatment Plant has a treatment capacity of 200,000m<sup>3</sup> per day which can be doubled in the rainy season.

N/A	Shuyang	N/A	200,000, water
-----	---------	-----	----------------

The Jiangsu Shuyang Shuyuan Tap-Water Supply Plant will treat 100,000m<sup>3</sup> per day as designed, 50,000m<sup>3</sup> per day in the first phase.

N/A	Yichang	N/A	1million, water
-----	---------	-----	-----------------

The Hubei Yichang urban area water supply plant provides 440,000m<sup>3</sup> of water per day. A second project in the province, the Hubei Jiayu tap water project treats 80,000m<sup>3</sup> of water per day, serving 160,000 people.

N/A	Tonglu	N/A	100,000, water
-----	--------	-----	----------------

The Zhejiang Tonglu Hengcun Tap-Water Supply Plant treated 20,000m<sup>3</sup> per day in the first phase and has been expanded to 50,000m<sup>3</sup> per day.

2005	Jingmen	N/A	250,000, wastewater
------	---------	-----	---------------------

The Hubei Jingmen Xiajiawan Wastewater Treatment Plant has a capacity of 100,000m<sup>3</sup> per day.

There are six other wastewater treatment plants in Hubei:

<b>Plant</b>	<b>Capacity</b>	<b>Wastewater – people served</b>
Hubei Xiangfan Guanying	100,000m <sup>3</sup> per day	250,000 people
Hubei Jingzhou	80,000m <sup>3</sup> per day	200,000 people
Hubei Zhijiang	60,000m <sup>3</sup> per day	200,000 people
Hubei Daye	60,000m <sup>3</sup> per day	150,000 people
Hubei Xianning	60,000m <sup>3</sup> per day	150,000 people
Hubei Jiayu	40,000m <sup>3</sup> per day	100,000 people

N/A	Baotou	BOT	550,000, wastewater
-----	--------	-----	---------------------

The Inner Mongolia Baotou Lucheng Wastewater Treatment Plant is a CNY320million project treating 200,000m<sup>3</sup> per day as designed, 100,000m<sup>3</sup> per day in the first phase and providing 55,000m<sup>3</sup> per day of re-usable water.

**Contact details**

Name: Sound Environment  
Address: 77 Lv Luo Road, Xiling District  
Yichang, Hubei 443000  
Tel: +86-717-644 2936  
Web: [www.eguard-rd.com](http://www.eguard-rd.com)

Wen Yibo (Chairman)  
Zhang Jingzhi (President)  
Choo Ben Lor (CFO)  
Li Li (CEO)

**SUZHOU NEW DISTRICT HI-TECH INDUSTRIAL CO LTD**

Suzhou New District Hi-Tech Industrial Co., Ltd. (SNDHT) is responsible for the development and operation of water, road, gas and power services for Suzhou's Hi-Tech Industrial Development Zone. The company was founded in 1994 and 24.5% of its shares were floated in August 1996, and is currently 48.6% held by Suzhou New District Economic Development Group.

There are 400 industrial facilities and 100,000 residents in the area. Demand for water is currently in excess of 300,000m<sup>3</sup> per day, provided by the city. The dedicated Suzhou Xinning Water Works was opened in 2000, providing 150,000m<sup>3</sup> per day, which can be doubled at a later date.

**Suzhou New District Hi-Tech Industrial Co. Ltd., profit and loss account**

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Public Service	29.2	29.5	66.7	75.9	69.9
Turnover	1,518.6	1,981.0	2,632.8	3,056.8	3,117.3
Operating profits	276.8	227.5	332.3	345.2	318.4
Net income	143.0	155.4	222.3	205.3	209.9
Earnings per share (CNY)	0.174	0.189	0.266	0.23	0.24

In December 2002, SNDHT acquired a 25% stake in Suzhou New District Xinning Running Water Development Co Ltd, a water utility company, from Suzhou New District Economic Development Group Corp, a unit of Chinese state-owned Suzhou government, for CNY17.2million.

**Contact Details**

Name: Suzhou New District Hi-Tech Industrial Co., Ltd.  
Address: 25/F Jinhe Building, 35 Sishan Road,  
New District, Suzhou, Jiangsu Province 215011, China  
Tel: +86 512 680 72581  
Fax: +86 512 809 9281  
Web: www.sndht.com

Ji Xiangqun (Chairman)  
Gao Jianping (Vice Chairman)  
Xu Ming (President)  
Pan Cuiying (Finance Director)

**TIANJIN CAPITAL ENVIRONMENTAL PROTECTION**

Tianjin Capital Environmental Protection Company Limited (TCEP) is involved in sewage treatment and other municipal services and operates in Tianjin and Guizhou Province. During 2005 it operated nine subsidiaries and had a total sewage treatment capacity in the Tianjin region of 1.49million m<sup>3</sup> per day and processed 131million m<sup>3</sup> of sewage. At the start of 2006, TCEP's services covered the South-western regions, Yangtze River, and Jiangsu and Zhejiang provinces. TCEP's sewage treatment plants capacity outside Tianjin also increased to 1.02million m<sup>3</sup> per day. In 2007, the company's sewage treatment plants had a capacity of 2.485million m<sup>3</sup> per day, compared with 2.365million m<sup>3</sup> per day in 2006. Potable water sale volumes rose from 31.6million m<sup>3</sup> in 2006 to 349.7million m<sup>3</sup> in 2009 and recovered water sales rose from 1.8million m<sup>3</sup> in 2006 to 34.6million m<sup>3</sup> in 2009. 7,635.4million m<sup>3</sup> of sewage was treated in 2009.

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Sewage	505	652	853	N/A	1,066
Turnover – Potable water	N/A	31	28	N/A	37
Turnover – Water recycling	13	23	29	N/A	57
Turnover	612	812	1,002	1,159	1,257
Operating profits	266	229	311	308	343
Net income	176	159	209	231	243
Earnings per share (CNY)	0.13	0.12	0.15	0.16	0.18

The company is currently expounding its activities into other provinces. 63% of the company's equity is indirectly held by the Tianjin Urban Construction Bureau.

2001	Tianjin	26 year BOT	7,500,000 sewage treatment
------	---------	-------------	----------------------------

TCEP's main contract is with the Tianjin Sewage Company. TCEP acquired a series of sewage treatment works serving the city that was either in development or not complying with the appropriate standards. The Company processed 131million m<sup>3</sup> of sewage during 2005 against 227million m<sup>3</sup> in 2004, with revenues of CNY253million. This reflects the works being carried out during 2005. The Dongjiao sewage water treatment plant treated 123million m<sup>3</sup> of sewage during the year, against 132m<sup>3</sup> in 2004. The original Jizhuangzi sewage treatment plant (260,000m<sup>3</sup> per day) was rehabilitated during 2005 and is undergoing trials with a second plant (280,000m<sup>3</sup> per day). The other treatment plants, at Jizhuangzi (540,000m<sup>3</sup> per day), Xianyanglu and Beicang are being replaced or upgraded to meet contemporary standards. TCEP's sewage treatment plant capacity in the Tianjin region has reached 1,490,000m<sup>3</sup> per day.

2005	Baoying	26 year BOT	250,000 sewage treatment
------	---------	-------------	--------------------------

TCEP set up a joint venture in June 2005, for the Baoying Sewage Water Treatment Project. Baoying Capital Water Co., Ltd. has a registered capital of CNY38million, 70% held by TCEP. Baoying Capital Water Co., Ltd. will build and operate a sewage water treatment plant with a capacity of 25,000m<sup>3</sup> per day, which can be expanded to 50,000m<sup>3</sup> per day. The total investment for the first phase of the joint venture was CNY93.4million.

2005	Hangzhou	26 year TOT	2,000,000 sewage treatment
------	----------	-------------	----------------------------

The Hangzhou Qige Sewage Treatment Plant joint venture was signed in June 2005 for a 26 year Transfer-Operation-Transfer (TOT) Project. The Hangzhou Tianjin Capital Water Company Limited has a registered capital of CNY257.5million, 70% held by TCEP. Phase I of Hangzhou Qige Sewage Water Treatment Plant has commenced operation, with a capacity of 400,000m<sup>3</sup> per day, with phase II (200,000m<sup>3</sup> per day) still under construction. The total investment is estimated at CNY881million.

2005	Fuyang	30 year licence	500,000 sewage treatment
------	--------	-----------------	--------------------------

In August 2005, TCEP's 98% held Fuyang Capital Water Co., Ltd. gained the contract for the Anhui Fuyang Sewage Water Treatment Project. The sewage plant's treatment capacity is 100,000m<sup>3</sup> per day, and has commenced operation. The project is under licensed operation, the transfer price was approximately CNY102million, with a term of 30 years.

2005	Honghu	TOT	350,000 water & sewage treatment
------	--------	-----	----------------------------------

The Hubei Honghu Sewage and Water Supply Project started in December 2005, with TCEP holding 98% of Hubei Honghu Capital Water Co., Ltd., which has acquired three facilities under a TOT contract; the sewage water treatment plant of Honghu city (70,000m<sup>3</sup> per day) and two water treatment plants with designed capacity of 80,000m<sup>3</sup> and 30,000m<sup>3</sup> per day. The total investment amount of the sewage treatment portion was CNY50million.

2005	Qijing	26 year BOT	750,000 water & sewage treatment
------	--------	-------------	----------------------------------

A cooperation agreement was signed in June, 2005, for recycled water supply and sewage treatment in the central urban area of Qijing in Yunan. A joint venture is being established with the Qijing City Recycled Water Supply and Sewage Water Treatment Corporation, to acquire the sewage treatment plant and the water supply plant through a 30 year TOT project. The Qijing Sewage Treatment Plant has a daily treatment capacity of 80,000m<sup>3</sup> (to be expanded to 160,000m<sup>3</sup> per day) and the No. 1, No. 2 and No. 3 Water Supply Plants have daily production capacities of 80,000m<sup>3</sup>, 60,000m<sup>3</sup> and 60,000m<sup>3</sup> respectively. The acquisition price of the assets will be approximately CNY290million. Qijing Capital Water Co., Ltd. is 90% held by TCEP.

2008	Xian	25 year TOT	1,000,000 sewage treatment
------	------	-------------	----------------------------

In March 2008, TCEP acquired sewage treatment works of the Xian Capital Water Company Limited along with a 25 year operations contract after a tender process for CNY643million. The plants were held by the Xian Sewage Water Treatment Plants and Xian Infrastructure Investment and Construction Company (XICC). Sewage processing volumes are contracted to be 102,000m<sup>3</sup> per day for the first year of the contract and 114,000m<sup>3</sup> per day for the rest of the contract at the Xian Sewage Water Treatment Plant and 127,500m<sup>3</sup> per day for the first year and 142,500m<sup>3</sup> per day for the rest of the contract at the XICC Purification Centre. The two plants have a total maximum capacity of 310,000m<sup>3</sup> per day.

TCEP also has three industrial effluent treatment contracts serving: [1] the Tianjin Port Bonded Area, one of the functional areas of the Tianjin Binhai New District; [2] the Tianjin Binhai Mass Transit Development Co. Ltd.; and [3] the Huaxi sewage treatment plant and the Erqiao sewage treatment plant with a design capacity of 40,000m<sup>3</sup> per day in Guiyang City.

#### Contact Details

Name: Tianjin Capital Environmental Protection Company  
 Address: Chuangye Huanbao Building 76 Weijin South Road  
 Nankai District, Tianjin, 300381  
 Tel: +86-22-2393-0128  
 Web: [www.tjcep.com](http://www.tjcep.com)

Zhang Wenhui (Chairman)  
 Fu Yana (Deputy General Manager)  
 Shi Zhenjuan (CAO)

**WUHAN SANZHEN INDUSTRY HOLDING CO LTD**

Wuhan Sanzhen Industry Holding Co., Ltd. (WSI) was founded in 1998 and is responsible for the abstraction, treatment and distribution of drinking water to the city of Wuhan and the surrounding area. 25% of the company's shares were floated in April 1998, 71% being held by the Wuhan Water Business Group Co. Ltd.

305.5million m<sup>3</sup> of water was supplied in 2009, equivalent to serving 2million people.

**Wuhan Sanzhen Industry Holding Co., Ltd., profit and loss account**

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water supply	158.8	153.1	153.2	158.6	158.5
Sewage treatment	11.0	10.7	11.9	11.8	36.5
Turnover	170.9	290.1	238.7	230.7	304.1
Operating profits	19.3	85.0	51.9	40.7	-113.2
Net income	45.5	50.9	58.6	56.9	72.4
Earnings per share (CNY)	0.10	0.12	0.13	0.13	0.16

WSI's Zongguan and Baihezui waterworks supply water to 97% of the Hankou area. WSI is also involved in sewage treatment through the Wuhan Water Purification Plant, a 2-class sewage treatment plant.

**Contact Details**

Name: Wuhan Sanzhen Industry Holding Co., Ltd.  
 Address: 68 Tian Men Dun Road Jiang Han District  
 Wuhan 430015, Hubei, China  
 Tel: +86 27 8572 5739  
 Fax: +86 27 5872 5739  
 Web: www.600168.com.cn

Lqian Chen (Chairman)  
 Tu Lijun (President)  
 Li Sun (Finance Director)



**XINJIANG URBAN CONSTRUCTION CO LTD**

Xinjiang Urban Construction (Group) Co., Ltd. is principally engaged in real estate operation, municipal infrastructure construction, the supply of source water and new construction materials. During 2007, the Company obtained approximately 51% and 35% of its total revenue from its real estate operation and municipal construction, respectively.

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover - Water	61.3	59.6	53.5	60.8	64.8
Turnover	453.3	563.8	1,026.9	975.3	1,610.9
Operating Profit	47.3	49.1	77.8	66.0	213.1
Net Profit	24.6	31.0	44.7	43.3	155.3
EPS (CNY)	0.04	0.07	0.05	0.08	0.25

In 2004 Xinjiang Urban Construction acquired the operational assets of water supply works in Shidunzishan from Urumqi Municipal Water Supply Company. These had an asset value of CNY216million at the time.

**Contact Details**

Name: Xinjiang Urban Construction Co. Ltd.  
Address: Chengjian Building, No. 133 Nanhu South Road  
Urumqi, XNJ 830063, China  
Tel: +86 991 488 9803  
Fax: +86 991 488 9813  
Web: [www.xjci.com](http://www.xjci.com)

Liu Jun (Chairman)  
Ji Wei (President)  
Li Li (CAO)

**ZHONGSHAN PUBLIC UTILITIES GROUP CO., LTD.**

The company is mainly involved in water and sewerage services in Zhongshan, Guangdong Province. It is majority held by the municipality and was founded in 1992. In 2009, it gained its first contract outside the province, in Jiling, Shandong Province. The city has a population of 2.49million.

<b>Y/E 31/12 (CNYmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Water	-	345.9	440.9	646.2
Turnover – Sewage	-	51.7	78.5	80.4
Turnover	56.3	517.5	629.8	731.3
Operating Profit	15.5	80.4	112.9	111.7
Net Profit	22.0	1,150.3	549.7	817.0
EPS (CNY)	0.01	2.16	0.95	1.36

Tan Qingzhong, the previous Chairman and Zheng Xueling, the General Manager announced in June 2010 that they were resigning as a result of Government investigations relating to the company's 2007 corporate restructuring.

**Contact details**

Name: Zhongshan Public Utilities Group Co., Ltd.  
Address: 3/F Caixing Building  
No.18 Xingzhong Road  
Zhongshang, Guangdong 528403  
China  
Tel: +86-760-8380018  
Web: <http://www.zpug.net/>

Zheng Zhongqiang (Acting Chairman and Acting General Manager)  
Li Liao (CFO)

## INDONESIA

### ACUATICO

Acuatico Pte Ltd is a joint venture between PT Recapital Advisors (private equity, part of Renaissance Capital Asia) and PT Glendale Partners (infrastructure project management). It is an investment holding company for water infrastructure assets and is based in Singapore. In 2006, they acquired 95% of the equity of PT Thames PAM Jaya from Thames Water and the concession company was subsequently renamed PT Aetra Air Jakarta.

In August 2008, PT Acuatico gained a 25 year water provision concession for the city of Tangerang. The venture PT Aerta Air Tangerang (75% Acuatico/25% PT Capitalinc Investment Tbk) will start in 2009 and will require a total investment of IDR520.7billion, 30% from the venture and 70% from banks. The minimum target for customers towards the end of the concession period is 72,000. In August 2008 Ayser-Technische Corporation Pte Ltd (a subsidiary of Singapore's Meinhardt (Singapore) Pte Ltd) and Acuatico signed a Memorandum of Understanding seeking water infrastructure projects in Indonesia over the next three years with a combined value of USD200million.

1997	East Jakarta	25 year BOT	2.85million water
------	--------------	-------------	-------------------

The project is being funded 30% by equity and 70% by debt. Revenues for PT Aetra Air Jakarta are being driven upwards as more customers are connected. Some 2.85million people are currently served, up from 2.5million in 1998. 20,580 new connections were made during 2002, equivalent to 200,000 people. There were some 395,253 customers in 2009, with a 66% service coverage. The East Zone's population is forecast to rise from 4.6million to 5.8million by 2020. Non revenue water was 48.6% in 2004 and 49.7% in 2005 after a rebasing exercise. The concession aims to reduce this to 45% in 2006 (against an original target of 33% by 2008) and to 23% by 2017. Thames had invested USD106million between 1998 and 2008 in the project.

#### Contact Details

Name: Recapital  
 Address: Recapital Building, 10-11<sup>th</sup> Floor  
 Jl. Adityawarman Kav. 55, Jakarta  
 12160, Indonesia  
 Tel: +62 21 2702277  
 Fax: +62 21 7246881

#### Contact Details

Name: Glendale Partners  
 Address: Recapital Building 5th Floor, Jl.  
 Adityawarman No. 55, Kebayoran  
 Baru Jakarta 12160 Indonesia  
 Tel: +62 21 72787335  
 Fax: +62 21 72787334  
 Web: [www.glendalepartners.com](http://www.glendalepartners.com)

**INDIA****BHEL**

Bharat Heavy Electricals Limited (BHEL) is the largest related energy and infrastructure sector-engineering and manufacturing enterprise in India. It is 67.7% held by the Indian Government. Activities include manufacturing water testing systems and desalination plants. BHEL's Industrial Systems Group (ISG) has been seeking to develop private sector operations in water and wastewater treatment projects, which has been identified by the company as one of the principal areas for growth between 2002 and 2007. As part of this, the company has developed its ability to provide systems and services for water management systems including potable water pumping stations, desalination plants, water treatment plants and sewage and effluent treatment plants.

In 2003, BHEL commissioned three potable water pumping stations in the vicinity of Bangalore, providing 0.27million m<sup>3</sup> of water per day. The fully automated project has been set up by ISG for the Bangalore Water Supply and Sewerage Board, under the Cauvery Water Supply Scheme Stage IV. This project has entered a three year O&M period.

In September 2003, BHEL gained a wastewater treatment construction and operations contract in Chennai. The INR364million (USD7.9million) contract was awarded by the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB). The order envisages design, engineering, supply, installation and commissioning of mechanical and electrical equipment, besides automation and complete civil works of a 40,000m<sup>3</sup> per day sewage treatment plant at Nalsapakkam, Chennai serving approximately 300,000 people. The facility entered service in 2005, when BHEL will take over the plant's O&M for ten years. The sewage treatment plant will have its own power plant which will be run by biogas, generated within the facility, making it self-sufficient and lowering operating costs.

**BHEL, profit and loss account**

<b>Y/E 31/03 (INRmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Revenues	143,070	182,423	215,767	271,440	338,707
Pre-tax profit	26,544	37,361	44,304	48,380	66,209
Net profit	16,792	24,147	28,593	31,152	43,269
EPS (INR)	68.8	98.7	58.41	63.64	88.39

**Contact Details**

Name: BHEL  
 Address: BHEL House, Siri Fort,  
 New Delhi - 110049, India.  
 Tel: +91 11 26001046  
 Fax: +91 11 26001102  
 Web: [www.bhel.com](http://www.bhel.com)

Shri B Rao (Chairman and Managing Director)  
 Shri C S Verma (Finance Director)

**IVRCL CONSTRUCTION AND PROJECTS LTD**

IVRCL Constructions & Projects Ltd (IVRCL) has developed a policy of moving its construction activities from civil engineering to lump sum turnkey projects, to design and execution projects and in three cases BO/BOT concessions: The Alandur WWTW; the Tirupur MSW facility and the athletes' village for the December 2002 National Games in Hyderabad.

**IVRCL Constructions & Projects Ltd, profit and loss account**

<b>FY 31/03 (INRmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Net sales	10,629	16,945	25,059	38,673	49,854
Operating profit	612	1,233	2,376	4,685	3,119
Net profit	571	1,078	1,631	2,834	2,250
EPS (INR)	3.35	5.00	6.82	10.64	8.43

The company's regional structure was changed into a divisional structure in 2001. Currently water systems and pipelines account for 65% of orders as of May 2009 against 30% in 1998. The total order backlog at the time was INR122billion, of which INR76billion related to water and waste management projects. 48-53% of revenues in 2005-09 were from water and waste management projects.

The company gained the first BOT for wastewater treatment in India: A 14 year operating contract started in March 2003 for First STP Private Ltd (95%): JV with VA Tech Wabag Ltd (India, see company entry). A 12 Ml/day (4.4million m<sup>3</sup> pa) WWTW at Perungudi for Alandur Municipality, where IVRCL has installed the underground sewerage system. 25,162 households have been connected to the system, equivalent to 100,000 people. The facility was subsequently expanded to 24Ml/day (8.8million m<sup>3</sup> pa).

In 2005, the company's Chennai Water Desalination Ltd was awarded India's first desalination contract, a 25 year DBOOT worth INR4.901billion for a 100,000m<sup>3</sup> per day facility at Minjure, Chennai in Tamil Nadu. This is a joint venture with Spain's Befesa: 75% IVRCL, 25% Befesa. Work started in June 2008 and the project entered service in October 2009.

IVRCL also has a 114km bulk water provision construction project for supplying water from the Ongur River to Chennai, which contains a five year O&M component.

**Contact Details**

Name: IVRCL Constructions & Projects Ltd  
 Address: M-22/3RT, Vijayanagar Colony ,  
 Hyderabad, Andhra Pradesh 500 057 India  
 Tel: 040 2334 8467  
 Fax: 040 2334 5004  
 Web: [www.ivrcl.com](http://www.ivrcl.com)

E. Sudhir Reddy (Chairman and Managing Director)  
 R. Balarami Reddy (Finance Director)

**JINDAL AQUASOURCE**

Jindal Aquasource (also called Jindal Waterways Infrastructure Limited) is a subsidiary of the O. P. Jindal Group, an Indian company specialising in steel production and engineering (including pipe manufacturing), power and industrial gasses. The company was incorporated in 2006 Jindal Aquasource is developing a number of BOT/BOOT projects in India and has an alliance with Biwater (UK, see company entry) and Manila Water (Philippines, see company entry).

2008 was the first full operating year for the company, with revenues of INR1.92billion and a INR5.50billion order book in September 2009. Initial contracts have been for developing projects for its parent company, starting with a INR3.15billion engineer, procure and construct (EPC) contract for Raj West Power Ltd. BOT/BOOT projects under development will serve 600,000-800,000 people.

Projects identified to date:

**Angul**

A INR2.4billion EPC Raw Water Intake House & Cross country Pipeline and Transmission line from Samal Barrage (River Brahmani) to Jindal Steel & Power Integrated Steel/Power Plant at Angul, Orissa which is due to be opened by the end of 2010.

**Naya Raipur Development Authority project at Naya Raipur, Chhattisgarh**

A BOT contract worth INR2.4billion.

**Barmer Raw Water Conveyance Project, Rajasthan**

An EPC project worth INR3.1billion.

**Sitarganj Common Effluent Treatment Plant (BOOT) Project, Uttarakhand**

JECL (Jindal ES IPL (Sitarganj) Ltd) is 51% held by Jindal Water and 49% by Eldeco Sidcul Industrial Park Ltd. It holds a 30 year BOOT concession awarded in 2007 for a 8,000m<sup>3</sup> per day wastewater treatment plant serving the Industrial Park being developed in Sitarganj, District Udham Singh Nagar, in the state of Uttaranchal.

**Lodhika (GIDC) Industrial Association Integrated Water Supply System Project, Rajkot, Gujarat**

A MoU between Jindal water and the Rajkot Municipal Corporation was signed in 2009 for a INR3.0billion project. In February 2010, a 30 year BOOT contract worth INR1.05billion to develop a 45,000m<sup>3</sup> per day wastewater treatment works for Rajkot Municipal Corporation was signed. Construction will take until 2012 and it is forecast that the facility will have a 60 year operating life.

**Bhavnagar**

A 30 year BOOT contract worth INR1.0billion to develop a 45,000m<sup>3</sup> per day wastewater treatment works for Bhavnagar Municipal Corporation. Construction was underway in October 2009 and Jindal has exclusive rights to the recycled sewage water for the first 15 years, with a profit sharing agreement being implemented for the rest of the contract.

**Contact Details**

Name: Jindal Water Infrastructure Ltd

Address: 28 Shivaji Marg  
New Delhi, 110 015, India

Tel: +91-11-4502-1983

Fax: +91-11-4502-1982

Web: [www.jindalaquasource.com](http://www.jindalaquasource.com)

Prithvi Jindal (Vice Chairman)  
Sminu Jindal (Managing Director)  
Indresh Batra (Managing Director)

**JUSCO**

Jamshedpur Utilities and Services Company Limited (JUSCO) is 100% held by Tata Steel. It was formed in August 2004 and incorporated in April 2004 for improving the management of utility operations in the Tata Steel developed town of Jamshedpur and for leveraging this experience into other Indian markets. As Tata Steel's Town Division, JUSCO has managed municipal services in Jamshedpur since Tata Steel's foundation in 1907 and currently serves an area of 94km with a population of 700,000, with a continuous water supply for 500,000 people. Since 2007, JUSCO has gained a series of O&M and concession contracts in India as well as a series of design and build and management contracts in Madhya Pradesh.

**JUSCO, profit and loss account**

Y/E 31/03 (INRmillion)	2007	2008
Water services	N/A	1,214.2
Total revenues	2,198.9	2,722.7
Operating profit	191.9	302.4
Pre-tax profit	185.0	284.5
Post-tax profit	111.1	177.4

**JUSCO, service delivery in Jamshedpur**

Y/E 31/03	2004	2005	2006	2007	2008
Network coverage	66.0%	67.0%	72.1%	73.8%	78.0%
Partnership connections	0	613	4,181	5,789	9,585
Bacteriological compliance	N/A	93.0%	96.0%	98.5%	100.0%
Non-revenue water	N/A	33.0%	16.8%	13.9%	11.5%
Failures in water system	N/A	44	34	14	3
Energy consumption (Kwh per MI)	N/A	332	319	309	283

**JUSCO, concessions and O&M contracts**

2009	Mysore	6 year Management	800,000 water & wastewater
------	--------	-------------------	----------------------------

A INR1.62billion management contract involving rehabilitating and operating the city's water service, designed to provide a continuous water supply to the city. The project intends to extend household water supplies to poorer households.

2008	Haldia	25 year BOT	250,000 water
------	--------	-------------	---------------

The West Bengal city's 113,500m<sup>3</sup> per day water treatment works are to be managed for 25 years, along with the construction and subsequent management for 25 years of a new 113,500m<sup>3</sup> per day water treatment works. Other work includes billing and bill collection and management of the distribution system. The contract has been awarded to JUSCO, with Ranhill (Malaysia) and IDFC (India). The facility will cost INR10billion to construct and concession fees of INR12.2billion will be payable to the Haldia Development Authority.

2007	Jamshedpur	4 year O&M	50,000 water
------	------------	------------	--------------

An O&M contract covering the Tata Motor's township's 22,700m<sup>3</sup> per day water treatment works, and the distribution system, which serves 8,000 domestic connections.

2007	Kolkata	30 year BOT	30,000 water & wastewater
------	---------	-------------	---------------------------

A BOT for a 13,600m<sup>3</sup> per day water distribution network and an 8,300m<sup>3</sup> per day sewage treatment work are being developed by JUSCO and Voltas (India) for the Naba Diganta Industrial Township, Sector V, Salt Lake in Kolkata.

**Contact Details**

Name: Jamshedpur Utilities & Services Company Limited (JUSCO)  
Address: Sakchi Boulevard Road, Northern Town,  
Bistupur, Jamshedpur - 831001  
Tel: 91 657 2431914  
Fax: 91 657 2424219  
Web: [www.juscoltd.com](http://www.juscoltd.com)

Bushen Lal Raina (Chairman)  
Manish Sharma (Managing Director)  
GS Basu (General Manager, Water Management)



**LARSEN & TOUBRO**

Larsen & Toubro (L&T) specialises in construction and heavy engineering projects. The Power and Transmission division has been involved in water and wastewater construction projects for some years. A typical project being water treatment works for the Hubli-Dharwar Urban Water Supply Scheme in Karnataka. Contracts gained during 2004-05 included: Providing and laying of pipeline from Modhera to Dharoi as part of a lift irrigation project at Mehsana, Gujarat for Gujarat Water Resources Development Corporation Limited (INR2,530million) and providing water supply system to Bangalore under the Greater Bangalore Water Supply Project for Bangalore Water Supply and Sewerage Board (INR1,658million).

The first BOT contract gained by L&T is in Andhra Pradesh; the Visakhapatnam Industrial Water Supply Project. This is a 55.5km pipeline from the River Godavari to augment the 153km Yeleru Left Bank Canal. Some 15% of the output is going to domestic consumers. L&T has a 32 year concession for operating the pipeline, which started in December 2004, with equity financing from the municipality (Andhra Pradesh Industrial Infrastructure Corporation) and from the private sector; L&T Holdings and PSL Holdings, with a permitted return of 15% over the concession.

**L&T, profit and loss account**

Y/E 31/03 (INRmillion)	2006	2007	2008	2009	2010
Revenues	169,574	211,217	298,820	410,867	447,294
Operating profit	16,683	30,050	34,186	43,603	73,454
Net profit	13,172	22,401	23,254	30,170	53,150
EPS (INR)	23.22	38.68	38.95	63.90	90.17

**Contact Details**

Name: Larsen & Toubro  
 Address: L&T House, Ballard Estate, Mumbai 400 011, India  
 Tel: +91 22 2268 5656  
 Fax: +91 22 2268 5858  
 Web: [www.larsentoubro.com](http://www.larsentoubro.com)

A M Naik (Chairman and Managing Director)  
 Y M Deosthalee (Finance Director)  
 K Venkataramanan (President, Engineering & Construction Projects)

**VA TECH WABAG**

VA TECH WABAG Limited is part of the WABAG Group, which is principally based in India and Austria. VA TECH WABAG India Ltd was founded in 1996 and sold to ICICI Ventures of India in 2005 and in 2007, the shares of VA TECH WABAG GmbH were sold by Siemens AG to VA TECH WABAG Limited. An IPO of the company's Indian arm has been under consideration since 2009. In 2008-09, the group had revenues of EUR174million and orders received of EUR192million. The group has seven principal operating subsidiaries (one in India, four in Europe and two in North Africa) and is involved in a broad range of water and wastewater engineering work. Since 2002, this has involved a number of operating projects as well.

2006	Chennai	10 years DBO	400,000 Sewage treatment
------	---------	--------------	--------------------------

The wastewater treatment works serves Perungudi in Chennai, for the Chennai Metropolitan Water Supply & Sewerage Board, Tamil Nadu. The 110,000m<sup>3</sup> per day facility has a peak capacity of 275,000m<sup>3</sup> per day.

2006	Chennai	10 years DBO	200,000 Sewage treatment
------	---------	--------------	--------------------------

The wastewater treatment works serves Perungudi in Chennai, for the Chennai Metropolitan Water Supply & Sewerage Board, Tamil Nadu. The 54,000m<sup>3</sup> per day facility has a peak capacity of 135,000m<sup>3</sup> per day.

Since 2000, a number of contracts in India have included one to three year post completion O&M elements. Other relevant contracts include:

**Alandur, India:** Wastewater treatment with IVRCL (India, see company entry)

**Windhoek, Namibia:** One of the project partners with BWB (Germany, see RWE company entry) for the water reclamation project.

**Vadakuthu, India:** Upgrading of a 180,000m<sup>3</sup> per day water treatment works serving the Chennai Metropolitan Water Supply & Sewerage Board, Tamil Nadu. The facility entered service in 2005 and the contract included a five year O&M component.

**Contact Details**

Name: VA TECH WABAG India Limited  
 Address: 11, Murray's Gate, Alwarpet, Chennai 600 018, India  
 Tel: +91 44 42232323  
 Fax: +91 44 42232324  
 Web: [www.wabag.com](http://www.wabag.com)

Rajiv D Mittal (CEO)  
 Subramanian Varadarajan (Finance Director)

**JAPAN****MITSUBISHI**

Mitsubishi Corporation is Japan's largest Soga Sosha (general trading company) with an international presence in some 200 countries around the world. In 1998, the company acquired a 7% stake in Manila Water (see company entry). Mitsubishi is one of the leading Japanese O&M water service operators through its 50% ownership of Japan Water Corporation, which manages short term, renewable operation and maintenance contracts serving 14 municipalities and managing 250 water facilities. Mitsubishi has been involved in water treatment and desalination projects in Singapore, Pakistan, Colombia and Saudi Arabia. In February 2010 the company established a partnership with Japan's JGC Corporation and Ebara Corporation (the Ebara Partnership).

**Mitsubishi, profit and loss account**

Y/E 31/03 (JPYbillion)	2006	2007	2008	2009	2010
Revenues	19,069	20,527	23,103	22,389	17,099
Operating profit	352	410	355	589	181
Net profit	357	419	471	570	273
EPS (JPY)	210	247	283	166	222

In May 2010 Mitsubishi, Innovation Network Corporation of Japan (INCJ), JGC Corporation and Manila Water acquired United Utilities Australia Pty Limited (UUA) from United Utilities for AUD225million, AUD176million in cash and AUD49million in assumed debt. Since its inception in 1991, UUA has gained 14 long term contracts, serving a total of three million people.

2009	Adelaide	20 years, O&M	Desalination
------	----------	---------------	--------------

A joint venture with Acconia Agua (Acconia, Spain), with United Utilities' involvement due to start when the AUD1.83billion facility enters service in December 2010. The facility will have an average capacity of 150,000m<sup>3</sup> per day, with a peak capacity of 300,000m<sup>3</sup> per day. The joint venture seeks to gain similar desalination contracts in Australia.

2009	Berri Barmera	25 years DBO	4,000 water reuse
------	---------------	--------------	-------------------

The AUD14million project involves four wastewater treatment plants and the provision of treated wastewater for four irrigation sites in the Riverland area.

2009	Waikerie	15 years DBO	2,400 wastewater
------	----------	--------------	------------------

A AUD4million project for Loxton Waikerie District Council, including water recycling.

2008	North Queensland	20 years DBO	180,000 water
------	------------------	--------------	---------------

A AUD140million contract for two 40,000m<sup>3</sup> per day water treatment works and an upgrade of the existing facility in Townsville. UUA is already involved in an industrial water project with BHP Billiton in the area. The population of Townsville has been rising by approximately 5,000 a year.

2008	Bustard Bay	10 + 5 + 15 years O&M	1,300 water & wastewater
------	-------------	-----------------------	--------------------------

The communities of Seventeen Seventy township and Agnes Water in Miriam Vale Shire in Queensland. A RO desalination plant and a wastewater treatment and recovery facility form the centre of a AUD40million plan to lower water usage in the area. UUA has a ten year contract with five and fifteen year renewal clauses.

2008	SE Queensland	5 years O&M	Bulk water
------	---------------	-------------	------------

LinkWater, the authority responsible for the bulk transfer of potable water in SE Queensland signed a AUD50million five year O&M agreement with UUA and Transfield in April 2008. UUA and Transfield Services will assist LinkWater to operate and maintain new water grid pipeline assets currently under construction, along with more than 200km of existing mains and associated works such as pumping stations and potable water reserves. The contract was re-negotiated in March 2010.

2004	Fleurieu Peninsula	20 year BOT	5,000 wastewater
------	--------------------	-------------	------------------

A AUD32million wastewater treatment plant for Victor Harbour in South Australia, designed to handle an average flow of 5Ml/day. The facility entered service in mid 2005. Victor Harbour is a tourist resort on the Fleurieu Peninsula, with a resident population of 5,000 and an average population of 20,000.

2003	Onkaparinga	25 year DBO	10,000 wastewater
------	-------------	-------------	-------------------

The 1,300m<sup>3</sup> per day facility treats wastewater from the city's sewerage and septic tanks from the city with the reused water irrigating vineyards in the McLaren Vale and Willunga regions.

2003	Coliban	10 + 5 year O&M	130,000 water & wastewater
------	---------	-----------------	----------------------------

Campaspe Asset Management is responsible for O&M for a number of municipalities in northern and central Victoria. This includes 19 water and 13 wastewater treatment plants.

1993	Melbourne	25 year BOOT	70,000 water
------	-----------	--------------	--------------

This was the first BOOT project in the Australian Water industry, involving the renovation of Yan Yean reservoir, the oldest in Victoria, particularly during summer months when demand is high. A new direct filtration plant has replaced existing basic treatment facilities and now has a capacity of 155,000 m<sup>3</sup>/day. It can reach a population of over 300,000 and supply 100,000 of these people at any one time. After AUD25million in spending, the refurbished facility entered service in 1994.

1995	Sydney	25 year BOOT	230,000 water
------	--------	--------------	---------------

The Build, Own, Operate, and Transfer (BOOT) contract was awarded to UUA and Transfield in 1992 and the facility entered service in 1995. It involved the construction of a new water treatment works costing AUD123million. The plant provides a population of 230,000 people with up to 265Ml/day of water. After 25 years, Sydney Water can either buy the facility or renegotiate another operations contract.

1996	Adelaide	25 year BOOT	154,000 water
------	----------	--------------	---------------

UU won the Adelaide BOOT contract for water treatment in South Australia's Riverland region in 1996. The AUD115million BOOT for 10 water treatment plants serves over 150,000 people in 90 communities. The consortium is made up of UU (50%) and AMP (Australia, 50%). Construction was from 1997-99, and the facility entered into service in September 1999.

In May 2000, UU Australia signed a AUD23million DBO contract with Queensland Nickel for a wastewater treatment plant designed to recover nickel from process water. The contract was re-negotiated in 2005 and has a new ten year term. In September 2000, UU announced that it is seeking to develop an underground lake discovered by Anaconda Nickel Ltd of Perth in the Western Desert. The lake is estimated to hold 2,000billion L of water. It is located in the Officer Basin, 400km from the mining area of Kalgoorlie. The water is suitable as industrial water or could be treated for human consumption.

#### Contact Details

Name: Mitsubishi Corporation  
 Address: 3-1 Marunouchi 2-chome, Chiyoda-ku, Tokyo 100-8086 Japan  
 Tel: 81-3-3210-2121  
 Web: [www.mitsubishicorp.com](http://www.mitsubishicorp.com)

Mikio Sasaki (Chairman)  
 Yorihiro Kojima (President and CEO)  
 Ryoichi Ueda (CFO)

**mitsui**

In March 2006, Mitsui acquired 26% in Thai Tap in Thailand, along with 25% of Pathum Thani (Thai Tap, see Company entry). The company subsequently acquired 85% of Earth Tech's Mexican activities from Aecom in 2008.

**Mitsui, profit & loss account**

Y/E 31/03 (JPYbillion)	2006	2007	2008	2009	2010
Revenues	4,115	4,794	5,739	5,505	4,096
Operating profit	233	235	312	209	77
Net profit	202	302	410	178	150
EPS (JPY)	118	165	225	97	82

In June 2001, Earth Tech acquired Atlatec S.A. de C.V. (Atlatec), the Environmental Division of Cydsa. S.A. de C.V. Atlatec specialises in the provision of water and wastewater treatment services to the refinery industry and is moving into the water distribution market. Concessions include wastewater treatment facilities for Pemex refineries located in Cd. Madero, Tula, Cadereyta and Minatitlán.

2004	Chihuahua	20 year DBFO	250,000 wastewater
------	-----------	--------------	--------------------

The original project was awarded to Atlatec in 1994. It serves the northern region the city and treats 5million gallons of wastewater per day. Earth Tech has operated the plant since 1995. The client is the Junta Municipal de Agua y Saneamiento de Chihuahua.

2004	Chihuahua	10 year DBFO	500,000 wastewater
------	-----------	--------------	--------------------

The second facility has been located in the southern region of the city and it treats more than 50million gallons of wastewater per day having entered service in 2006. The two facilities will account for the entire city's wastewater.

2002	Orizaba	20 year DBFO	117,000 water & sewerage
------	---------	--------------	--------------------------

In September 2002, the company gained a USD15.5million DBO for a wastewater treatment plant in Orizaba by Fideicomiso del Sistema de Aguas Residuales del Alto Rio Blanco (FIRIOB), a local industrial grouping. The system will treat 80,000m<sup>3</sup> of wastewater daily with a biochemical oxygen demand of 109.9tonnes per day. The facility will treat wastewater from Orizaba, as well as wastewater from a brewery, a paper mill and 12 other industries. Work was completed in August 2004. 70% of the finance comes from FIRIOB and 30% from municipal sources.

2003	Xalapa	20 year DBFO	400,000 water & sewerage
------	--------	--------------	--------------------------

A USD55million DBFO water and wastewater contract for the town of Xalapa was awarded to ET's Aguas Tratadas de Xalapa, including increasing the connection rate to these services from 50% to 100%. Works will include a 65,000m<sup>3</sup> per day water treatment plant due to enter service in 2005. Base revenues from 2005 will be USD7.0million pa.

**Contact Details**

Name: Mitsui & Co Ltd  
 Address: 2-1 Ohtemachi 1-chome, Chiyoda-ku, Tokyo 100-0004 Japan  
 Tel: 81-3-3285-1111  
 Fax: 81-3-3285-9819  
 Web: [www.mitsui.co.jp](http://www.mitsui.co.jp)

Shoei Utsuda (Chairman)  
 Masami Iijima (President and CEO)

**MALAYSIA****GOLDIS**

Goldis is a holding company for a group of private equity projects ranging from property development to organic fish farming. The company was founded in 2000 as a merger of two holding companies and floated on the KLSE in May 2002. Crest Spring (Shanghai) Co Ltd is a subsidiary of Gold China Sdn Bhd, which is a subsidiary of Goldis Berhad and is the holding company for its Chinese water and wastewater treatment operations. The company believed that it could gain six or seven water contracts by early 2007 and aims to serve 4million households in China To date, five contracts are under development, two of which have entered into service. Goldis is also seeking contracts in Thailand, Indonesia and Abu Dhabi. The water activities made a maiden operating profit of MYR3.9million in 2010.

**Goldis Bhd, profit & loss account**

Y/E 31/01 (MYRmillion)	2006	2007	2008	2009	2010
Turnover – Water	N/A	3.0	2.7	4.9	6.3
Group turnover	183.0	215.3	174.7	212.7	198.4
Pre-tax profits	27.4	64.7	32.2	46.3	40.1
Net profits	34.5	65.4	31.9	42.8	40.9
Earnings per share (MYR)	0.10	0.21	0.10	0.09	0.08

Contracts in operation or development to date cover approximately 500,000 people. In June 2005, Goldwater gained a contract with Tie Ling City (Liaoning Province) for a 100,000m<sup>3</sup> per day sewage treatment plant and a linked 50,000m<sup>3</sup> per day water treatment and recovery plant. The construction work will cost MYR75million, with the cost of the concession contract being MYR125million.

In March 2006, Goldis via its 81% held subsidiary Jiangsu Gold Water Co. Ltd acquired 77.5% of Ganyu Xin Cheng Sewage Treatment Co Ltd for MYR7.75 million (MYR3.62million). This covers two contracts:

[1] a 20 year operating concession for a 20,000m<sup>3</sup> per day sewage treatment plant in DaJiJia, Western District of Yantai Economic and Technical Development Zone, Yantai, Shandong Province;

[2] a 20 year concession for a 20,000m<sup>3</sup> per day sewage treatment plant in Ganyu County, Lianyungang City, Jiangsu Province. Construction is anticipated to take 2-3 years.

The Ganyu (Jiangsu Province) BOT entered service in 2007 and the Dajijia (Shandong Province) BOT entered service in 2008.

In 2009, the company gained a 25 year BOT contract for a sewage treatment plant serving Zhou Chang Industrial Park, Shandong.

**Contact Details**

Name: Goldis Bhd  
 Address: Suite 28-03, Level 28, GTower  
 199 Jalan Tun Razak  
 50400 Kuala Lumpur, Malaysia  
 Tel: 603-2168 1888  
 Fax: 603-2163 7020  
 Web: [www.goldis.com.my](http://www.goldis.com.my)

Tan Lei Cheng (Chairman and CEO, Goldis)  
 Mickey Ng Koon Yee (Chairman, Gold Water)  
 Gary How Kim Kong (CFO, Gold Water)

**INTAN UTILITIES BERHAD**

Intan Utilities Berhad's (IU) 46.19% held associate company Jauhari Harapan Sdn Bhd (JHSB) owns Metropolitan Utilities Sdn Bhd (MUC) and Air Utara Indah Sdn Bhd (AUI). In 1989, MUC gained a 20 year concession for bulk water provision, treatment and supply to Lembaga Air Perak, the state government of Perak's water authority. Under the concession, MU supplies water to Ipoh, the state capital, and the regions of Ulu Kinta, Sungai Tarap and Tanjung Talang. In 1996, the concession was extended to 2024. IU was founded in 1995 and floated on the Kuala Lumpur Stock Exchange in July 1997. In June 1998, Veolia Water Asia Pacific Pte Ltd (VWAP) acquired 26% of IUB to become its largest individual shareholder. This share was subsequently increased to 30%. In January 2003, IUB sold 30% of the share capital of MUC to VWAP for MYR36million, with VWAP selling back its 30% stake to IUB and its other major shareholders.

Vista Meranti Sdn Bhd, a wholly-owned unit of HQZ Credit Sdn Bhd, raised its interest in Intan Utilities from 57.7% to 98.70% in January 2007 and delisted the company.

**Intan Utilities, profit and loss account**

Y/E 31/12 (MYRmillion)	2003	2004	2005
Water provision	48.0	48.2	8.1
Group turnover	78.7	100.2	829.0
Operating profit	12.0	20.1	25.0
Net income	6.4	11.8	18.2
Earnings per share (MYR)	0.17	0.12	0.19

The concession serves 600,000 people. Profits for the water activities in 2002 were MYR25.2million, falling to MYR16.4million in 2003. The fall in revenues and profits reflects the end of the construction contract for a new pipeline serving the state. During 2004, revenues and margins have stabilised. Following VWAP's stake acquisitions, VWAP's CGE Utilities has taken over the operation of the concession, while IUB continues to own the concession itself.

The company announced that in 2006 it is seeking to divest its water interests to concentrate on developing its retail activities. These have been deconsolidated in 2005 as an associate company. JHSB generated revenues of MYR112.2million in 2005 and a pre-tax profit of MYR18.4million.

**Contact Details**

Name: Intan Utilities Berhad  
 Address: Level 13 (East Wing), Berjaya Times Square, No 1 Jalan Imbi,  
 55100 Kuala Lumpur, Malaysia  
 Tel: +60-3-2935-8888  
 Fax: +60-3-2935-8043  
 Web: [www.intan.com.my](http://www.intan.com.my) (currently 'under construction')

Freddie Pang Hock Cheng (Chairman)  
 Low Ah Ha (Director)  
 Su Swee Hong (Corporate Secretary)  
 Wong Pooi Cheong (Corporate Secretary)

**Contact Details**

Name: HQZ Credit Sdn. Berhad  
 Address: Level 12 (East Wing), Berjaya Times Square, No 1 Jalan Imbi,  
 55100 Kuala Lumpur, Malaysia  
 Tel: +60-3-2148-1009

**KUMPULAN PERANGSANG SELANGOR BERHAD**

Kumpulan Perangsang Selangor Berhad (KPS) was incorporated in 1975 as part of the state of Selangor's Kumpulan Darul Ehsan Berhad (KDEB). KDEB is designed to encourage private sector investment and participation in developing the state's infrastructure and services. After a partial divestment from KDEB, KPS was listed on the Kuala Lumpur Stock Exchange on 22 July 2003 and remains 60.1% held by KDEB. In recent years, the company has concentrated upon property development, highways and water concessions.

Principal water service company holdings, 2010

Perangsang Water Management Sdn Bhd	40%
Konsortium ABASS Sdn Bhd	55%
Syarikat Pengeluar Air Selangor Holdings Bhd, (SPLASH)	30%
Taliworks Corporation Berhad (see Company entry)	20%

SYBAS started in January 2005, distributing water to 6million people and industrial and commercial clients in the Klang Valley. Puncak Niaga holds the other 70% (see Company Entry). A controlling 55% stake in ABASS was acquired in April 2006.

In July 2003, Selangor awarded KPS a MYR2.5billion water treatment project under the Langat Two Water Scheme. This involves the transfer and treatment of water from Pahang state to Selangor in four equal stages of 545,000m<sup>3</sup> per day, pending ratification from the Federal Government. It is anticipated that Puncak Niaga (see separate entry) will take a significant stake in the project.

Current structure of water activities in Selangor

Concessionaire	Syarikat Pengeluar Air Selangor Holdings Bhd, (SPLASH)
Activity	Water treatment (2,000,000m <sup>3</sup> per day)
Shareholders	KPS (30%), Gamuda (40%), TSWA (30%)
Concessionaire	Konsortium ABASS Sdn Bhd
Activity	Water treatment (545,000m <sup>3</sup> per day)
Shareholders	KPS (55%), OM (45%)
Concessionaire	Puncak Niaga
Activity	Water treatment (1,905,000m <sup>3</sup> per day)
Shareholders	Puncak Niaga Holdings Bhd (see company entry)
Concessionaire	SYBASS
Activity	Water distribution
Shareholders	KSP (15%), KDEB (15%), Puncak Niaga Holdings (70%)

**Selangor's proposed consolidation**

The Selangor Government is seeking to consolidate the various concessions under KDEB from 2009. This is in part due to a 37% tariff increase in 2009 by SYABAS under its concession agreement. This will involve KDEB buying out the various stakes in these concessions that it does not currently hold at a cost in the region of MYR12billion.

<b>FY 31/12 (MYRmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Sales - Water	N/A	62.1	134.1	136.1	139.6
Net sales	308.9	378.6	425.6	305.8	300.7
Operating income	-137.3	71.3	135.6	45.3	153.4
Pre-tax profit	-123.8	28.3	61.3	-4.2	115.7
Net income	-48.8	18.8	32.0	-3.2	75.2
Earnings per share (Sen)	-11	4	7	-0.1	16



**Indonesia**

In August 2003, KDEB signed a memorandum of understanding with Indonesia's PT Pengembangan Investasi Riau in Sumatra. KDEB and Malaysia's Putera Capital Bhd entered an understanding with PT Pengembangan Investasi Riau to provide a water supply from the Rokan River to Dumai village in a project worth MYR280million.

**Contact Details**

Name: Kumpulan Perangsang Selangor Berhad  
Address: 16th Floor, Plaza Perangsang,  
Persiaran Perbandaran, 40000 Shah Alam  
Tel: 603-5510 3999  
Fax: 603-5510 9977  
Web: [www.kps.com.my](http://www.kps.com.my)

YBhg Dato' Haji Abd, Karim bin Munisar (Executive Chairman)  
Arthur Wong (CFO and Acting CEO)  
Abdul Karim Endut (General Manager, Water Management)

**PBA HOLDINGS BHD**

Perbadanan Bekalan Air Pulau Pinang Sdn Bhd (PBA), a subsidiary of PBA Holdings BHD, is a water supply company operating in raw water abstraction, water treatment and supply. In 1999 the Penang Water Authority was corporatised as PBA. PBA operates a 30 year water concession in Northern Penang, Malaysia. The company was floated on the Kuala Lumpur Stock Exchange in April 2002, when 45% of PBA's equity was sold by the state Government, raising MYR194million (USD51million).

The state has six dams with a total water storage capacity of 46.0million m<sup>3</sup>. Currently, PBA has a total design capacity to supply about 1.27million m<sup>3</sup> of treated water per day from its 10 treatment plants to meet the average supply demand of 0.913million m<sup>3</sup> and consumption of 0.739million m<sup>3</sup>. The network is in relatively good order, with non revenue water falling from 19.4% in 2003 to 16.9% in 2007 but rising to 19.1% in 2009, compared with the national average of 37.5% in 2007. Water revenues rose from MYR153.7million in 2005 to MYR162.6million in 2006. Water consumption grew from 195.8million m<sup>3</sup> in 1999 to 262.5million m<sup>3</sup> in 2007. A tariff review has been under consideration since 2005, as operating costs rose by 39% between 2000 and 2005 and have not been increased since 2001. There were 493,324 customers at the end of 2009, 432,422 domestic and 60,812 trade customers, serving a population of 1.58million. There were 338,523 customers in 1999.

**Perbadanan Bekalan Air Pulau Pinang Sdn Bhd, profit and loss account**

Y/E 31/12 (MYRmillion)	2005	2006	2007	2008	2009
Sales – Water	153.7	162.6	N/A	175.1	174.8
Sales – Bulk water	N/A	N/A	N/A	12.2	8.2
Sales	162.3	171.8	181.2	187.9	184.7
Profit before tax	42.5	43.8	51.6	27.8	15.8
Net income	37.5	32.9	42.6	31.3	14.8
Earnings per share (Sen)	9.9	9.7	12.9	9.1	4.5

**China**

2003	Yi Chun City	30 year BOT	1,100,000 water
------	--------------	-------------	-----------------

The BOT was awarded to PBA's Pinang Water Ltd. PWL is 26% held by PBA, along with the Ranhill Utilities (37%) and YLI Holdings Bhd (37%). Yi Chun is in Jiangxi Province, near Shanghai. The project involves the construction of a 100,000m<sup>3</sup> per day water treatment plant in two equal phases, the first entering service delivering an initial 50,000m<sup>3</sup> per day in 2006 and the second phase during 2010. The project is forecast to generate revenues of CNY243million with an initial investment of CNY12million. A 5.5% tariff increase was secured in 2009.

**Contact Details:**

Name: Perbadanan Bekalan Air Pulau Pinang Sdn Bhd  
 Address: 32/F Komtar, 10000 Penang, Malaysia.  
 Tel: +60-4-263-4200  
 Fax: +60-4-261-3581  
 Web: [www.pba.com.my](http://www.pba.com.my)

Y.A.B. Lim Guan Eng (Chairman)  
 Ir. Jaseni bin Maidinsa (CEO)  
 Puan Joyce Lee Suan Imm (CFO)

**PPB GROUP BERHAD**

PPB Group Berhad was founded in 1968. It is a conglomerate active in sugar refining, flour and feed milling, edible oils processing, oil palm cultivation, film exhibition and distribution, property development, shipping and waste management. Utilities and environmental engineering activities are undertaken by its 55% held subsidiary Chemquest Sdn Bhd. Chemical Waste Management Sdn Bhd (CWM) is owned held by Chemquest. CWM has been developed for design and build water and wastewater treatment projects in Malaysia, with six such projects worth MYR259million being carried out between 2005 and 2006. Flood mitigation projects and water and sewage treatment works engineering projects in Malaysia generated revenues of MYR258million in 2007.

In October 2005, Chemical Waste Management Sdn Bhd sold its 25% equity interest in Konsortium Abass Sdn Bhd for a total cash consideration of MYR132.0million. Konsortium Abass has a 30-year concession with the Selangor State Government to undertake the operation and maintenance of the existing facilities of the Sungai Semenyih Water Supply Scheme. See Company Entry on KPS.

**PPB Group Berhad, profit and loss account**

<b>FY 31/12 (MYRmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Sales – Environmental Eng	70.9	102.2	95.3	427.8	255.1
Net sales	10,688	11,520	6,154	3,462	3,412
Operating income	517	584	407	411	436
Net income	395	5601	6,973	1,287	1,616
Earnings per share (Sen)	33.3	47.3	588.2	108.5	136.3

**China**

Through the Beijing Kerry Veolia Waste Water Treatment Co (51% held by Chemquest) PPB is leading a consortium to run the CNY201million Lugouqiao Sewage Treatment Plant (Phase I) project in Fengtai District, Beijing. The contract was awarded in July 2003. KUL holds 51% of Beijing Kerry Veolia Waste Water Treatment Company (BKV) with Veolia Environnement. Kerry Utilities subscribed CNY21.4million to BKV, which funded the construction of the sewage treatment plant with a treatment capacity of 100,000m<sup>3</sup> per day for the 2008 Beijing Olympiad. The consortium raised CNY85million for the project while the BWDG funded the CNY116million balance with loans from the World Bank. A 20 year operating concession started in July 2004 and will generate total revenue in excess of CNY1billion over the concession period. This is the first international WWTW BOT in Beijing.

PPB is also involved with Veolia's Hohhot 30 year 520,000m<sup>3</sup> per day water treatment contract in Inner Mongolia.

**Contact Details**

Name: PPB Group Berhad  
 Address: Wisma Jerneh, 38 Jalan Sultan Ismail,  
 50250 Kuala Lumpur, Malaysia  
 Tel: 603 2117 0888  
 Fax: 603 2117 0999  
 Web: [www.ppbgroup.com](http://www.ppbgroup.com)  
[www.chemquest.com](http://www.chemquest.com)

Datuk Oh Nam Siew (Chairman)  
 Dato' Lim Chee Wah (Deputy Chairman)  
 Tan Gee Sooi (Managing Director)  
 Leong Chy Ying (CFO)

## PUNCAK NIAGA BERHAD

Puncak Niaga (PN) was incorporated in January 1997 and listed on the Kuala Lumpur Stock Exchange in July 1997. PN is the holding company for Puncak Niaga Sdn Bhd (PNSB), which was incorporated in 1989 and gained the water treatment operation and management contract for facilities responsible for 70% of water supplied to the state of Selangor and the Federal Territory of Kuala Lumpur in 1994. A second contract, for expanding the state's water treatment capacity was awarded in 1997. The population of Selangor and Kuala Lumpur grew from 5.37million in 2000 to 7.3million in 2009. Demand rose from 3,088Ml/day in 2000 to 3,924Ml/day in 2009.

### Water treatment

The first concession agreement was signed in September 1994 for the operation of 26 WTPs. The second concession, signed in March 1995, is for a construction come operation agreement for the 950Ml/day Sungai Selangor Water Supply Phase 2 Project (SSP2) treatment plant. Two further agreements cover two additional water treatment plans. In 2007, total treatment capacity was 1,930 Ml per day. The concessions are due to expire at the end of 2020. 33.9% of PN's equity is held by Central Plus Sdn Bhd and 2.9% by Corporate Line Sdn Bhd, the original investors in PNSB. In 2005, PN took over from Veolia as the operator of the water treatment works.

The main project has been the development of the SSP2 water treatment plant. Stage 1 was completed in 2000 with a capacity of 475million L per day. Stage 2, costing MYR533.9million, entered service in 2001 and supplies a number of towns and parts of Kuala Lumpur. It also has a daily production capacity of 475million L. Delivery in 2009 was 963.0million L per day. PNSB is involved in the financing, design, construction, operations, maintenance and management of SSP2. PNSB now produces 1,930million L of water per day. It is likely that a third construction phase will be required by 2010.

It is understood that PN is looking at ways of managing Indah Water Konsortium, the renationalised national sewerage and sewage treatment company. The State of Selangor is considering acquiring all water assets in the state. Bids of USD1.8-3.7billion were mentioned in the press during 2008.

### Puncak Niaga, profit and loss account

Y/E 31/12 (MYRmillion)	2005	2006	2007	2008	2009
Turnover - Water	1,071.1	1,265.9	1,333.1	1,394.9	1,435.8
Water tariff compensation	0.0	0.0	0.0	0.0	434.2
Turnover	1,144.9	1,428.1	1,389.8	1,415.3	1,887.0
Pre-tax profit	196.8	367.3	115.4	54.9	312.6
Net income	99.3	331.6	97.6	21.6	142.3
Earnings per share (MYR)	0.31	1.45	0.24	0.05	0.35

### Water distribution

In December 2004 PN's 70% held subsidiary Syarikat Bekalan Air Selangor Sdn Bhd (SYABAS) was awarded a 30 year concession for operating the water supply services in the state of Selangor and the Federal Territories of Kuala Lumpur and Putrajaya by the Federal Government. It is understood that MYR2billion will be needed to replace 6,000km of supply pipes. The concession started in January 2005 and covers 7.1million people via 1.48million customer connections, rising to 7.3million people and 1.664million domestic and business connections in 2009.

Non revenue water was 33.0% in 2007, down from 42.8% in 1994, but still short of the 15% target for 2015. Financial constraints due to no tariff rises meant that NRW was 32.3% in 2009. After the replacement of 202,420meters in 2007, no water meters are more than seven years old. During 2007, PN spent MYR400million replacing 500km of water pipes. The company had previously replaced 336km of its 5,600km network.

SYBAS plans a total spending of MYR110billion during the 30-year water concession period in Kuala Lumpur, Selangor and Putrajaya. This will include MYR10.7billion for capital expenditure, including

development and upgrading of its distribution system (MYR4.8billion); asset management and replacement (MYR2.1billion); non-revenue water (NRW) reduction programme including pipe replacement (MYR2.7billion); and provision for land matters (MYR1.1billion).

### International developments

PN has opened affiliated offices in Brunei, Philippines, Indonesia and Cambodia with the longer term aim of entering these markets on a JV basis. In November 2002, PN gained a MYR234million contract to lay a 1,124km water pipeline to Chennai in India which entered service in 2004 and involves a five year management contract from 2005-10.

In May 2008, Sino Water, a joint venture between PN (80%) and Environmental Holding (20%) of Singapore was formed. Subsequently, Sino Water acquired 83% of Luwei (Pingdingshan) Water based in Lushan, Henan Province in August 2008 and 100% of Xinnuo Water (Binzhou) Limited, a company based in Laodian Village, Binzhou County, Shandong Province in July 2008, along with Luancheng Dayu Water Supply Co (water distribution in Luancheng County, Hebei) and Hebei Sino Panlong Industrial Water Supply Co (industrial water provision in Yuanshi County, Hebei) in 2009.

2008	Lushan	BOT	21,000 water treatment
2008	Binzhou	BOT	30,000 m <sup>3</sup> /day industrial wastewater
2009	Luancheng	BOT	120,000 water
2009	Yuanshi	30 year BOT	10,000 m <sup>3</sup> /day industrial water

### Contact Details

Name: Puncak Niaga Berhad  
 Address: 10<sup>th</sup> floor, Wisma Rozali,  
 No 4, Persiaran Sukan,  
 40100 Shah Ehsan, Selangor, Malaysia.  
 Tel: +(60) 3 5522 8589  
 Fax: +(60) 3 5512 0220  
 Web: [www.puncakniaga.com.my](http://www.puncakniaga.com.my)

Y Bhg Dato Rozali bin Ismail (Chairman)  
 Y Bhg Dato Hashim Mahfar (Managing Director)  
 Ng Wah Tar (Finance Director)

**RANHILL BHD**

Ranhill Bhd bought back its Ranhill Utilities Bhd subsidiary in October 2004. SAJ Holding Sdn Bhd (SAJH), the state of Johor Water Company was set up to operate the state's water supply services in 1994. In 2000, SAJH was awarded a 30 year concession to operate these services. SAJH was then reversed into Ranhill Holdings, which was in turn 60% held by Ranhill. After the reconsolidation, Ranhill Water Services was incorporated in March 2005 to cover Ranhill's water operations. In 2007, 2% of revenues came from the water activities in Thailand and China. This had been expected to rise to 25% by 2010, but the company is now adopting a more cautious expansion policy.

**Ranhill Bhd, profit and loss account**

<b>FY 31/06 (MYRmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water sales	359.9	732.4	533.3	623.3	643.0
Net sales	1,492.3	1,419.8	1,470.4	1,909.9	2,196.5
Operating profit	171.2	214.9	442.5	-306.2	328.9
Net income	33.1	-12.9	116.8	-736.6	210.7
Earnings per share (Sen)	6.3	-2.1	19.6	-123.3	35.3

The reporting year for water was changed from December to June in 2006 and there was an 18 month reporting period for the water activities in 2006.

SAJH has 43 water treatment plants and a 9,000km distribution network. Water provided meets WHO and Ministry of Health standards, and distribution losses are planned to fall to 20% as part of a 2000-2003 infrastructure investment plan costing MYR680million. The MYR650million Semangar water supply scheme is to be operational in 2003. Long term plans include expanding water consumption from 1,163Ml/day in 2000 to 1,764Ml/day by 2010. SAJH serves 3.4million people in 2005 and had 902,375 domestic, industrial and institutional customers at the end of 2007 compared with 787,894 in 2005. Non-revenue water was 32.5% in 2006 and 31.5% in 2007 rising to 32.2% in 2009, with the aim of reducing this to 20% by 2010.

**SAJH, operating data**

<b>FY 31/12 (MYRmillion)</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Water consumption (m m <sup>3</sup> )	297	309	318	334
Domestic customers	681,011	702,781	723,286	746,952
Non domestic customers	92,245	95,637	98,579	103,774

**China**

Operations in China and Thailand are carried out through Ranhill's 70% owned Ranhill KWI. In July 2003, RKWI gained a 30 year BOT to build and operate a 100,000 m<sup>3</sup> per day water treatment plant for Yichun City in Xiangji Province, China in two equal phases. RKWI holds 26% of the operating company, which will invest MYR37million into the project. Ranhill KWI gained two 30,000m<sup>3</sup>/day wastewater treatment BOT contracts in 2007; one serving the Hefei Chemical Industry Park and the other serving Xiao Lan. The Yinkou project is for the Yinkou Industrial Park in Liaoning.

2006	Yichun City	29 year BOT	125,000 water treatment
2007	Xiao Lan	29 year BOT	30,000m <sup>3</sup> /day wastewater
2007	Hefei	25 year BOT	30,000m <sup>3</sup> /day wastewater
2009	Yinkou	28 year BOT	30,000m <sup>3</sup> /day wastewater

PN acquired Global Environmental Solutions' Xinnuo Water (Binzhou) Ltd which was transferred to Sino Water (80% held by PN) in July 2008. The company is based in Yangxin County, Shandong and specialises in waste water treatment. Sino Water is planning to spend MYR250million on seven projects in China (including in Jiaxing, Da Shi Qiao, Tai Zhou Development Zone and Nanyang City) and a proposed TOOT for a 300,000m<sup>3</sup>/day wastewater treatment plant serving Jiaxing Province, all of which by 2013 will generate revenues of MYR100million pa.

**Thailand**

2000	Amata City	15 year O&M	9,600m <sup>3</sup> /day wastewater
2000	Amata City	15 year O&M	10,500m <sup>3</sup> /day water
2000	Amata Nakom	15 year O&M	36,000m <sup>3</sup> /day water
2005	Amata Nakom	20 year BOT	10,600m <sup>3</sup> /day wastewater
2005	Amata Nakom	20 year BOT	20,000m <sup>3</sup> /day water
2006	Amata Nakom	20 year BOT	Recycled water

In Thailand, Ranhill KWI has been operating three wastewater and potable water treatment plants since 2000, serving Amata City Industrial Estate, through a 20 year BOT. Ranhill KWI received a Letter of Award in May 2005 for a second 20 year BOT for a 10.6Ml/day water and a 9.6M/day wastewater and water recycling plant in Amata Industrial Estate (Phase 6). This will include a reverse osmosis facility and will be run by Anorak Water Treatment Facilities Co Ltd (AnuRAK), a special purpose vehicle. These contracts generated MYR2.5million of revenues in 2007.

In India, the company has a joint venture with JUSCO serving Haldia (see company entry).

**Contact Details**

Name: Ranhill Utilities Bhd

Address: 36<sup>th</sup> Floor, Vista Tower, 182 Jalan Tun Razak, 50400  
Kuala Lumpur, Malaysia.

Tel: +60-3-2171-2020

Fax: +60-3-2164-2235

Web: [www.ranhill.com.my](http://www.ranhill.com.my)

Web: [www.saj.com.my](http://www.saj.com.my)

Tan Sri Dato' Paduka (Dr) Sallehuddin Jaafar bin Mohamed (Chairman)

Hamdan Bin Mohamed (President and CEO)

Amran Awaluddin (COO)

**SALCON ENGINEERING BERHAD**

Salcon Engineering Berhad (SEB) was set up as a subsidiary of Kumpulan Emas Berhad (KEB) in 2002, building upon KEB's experience in the palm oil industry and engineering services for processing palm oil and treating process effluents and for providing water for these facilities. KEB has been involved in 450 water and wastewater engineering projects in Malaysia, Thailand, Vietnam and China since 1974. SEB was Listed on the KLSE in August 2003 via a reverse takeover of Seng Hup Corporation Bhd.

SEB concentrates on water and wastewater plant design, engineering, installing and O&M, along with related projects for the palm oil, timber and agricultural sectors. The Water & Environmental Division accounts for more than 50% of the company's turnover and profits. SEB was part of the consortium that gained the MYR308million Greater Ipoh Water Supply II BOT in Perak. In October 2002, SEB gained a 10 year O&M contract for the Sungai Terip water treatment plant in Negeri Sembilan, including five supply dams and a raw water pumping station. The contract is worth MYR200million. A non revenue water reduction contract in Sandakan was completed in 2005 and has entered a second phase from February 2006.

<b>YE 31/07 (MYRmillion)</b>	<b>2005 [1]</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water & environment turnover	109.2	73.8	87.2	210.4	N/A
Wastewater turnover	42.4	38.9	36.4	29.1	N/A
Construction turnover	N/A	N/A	N/A	N/A	274.0
Concessions turnover	N/A	N/A	N/A	N/A	88.9
Turnover	162.4	121.3	134.6	252.5	369.9
Water & environment profit	-29.8	-4.4	-10.9	14.0	N/A
Wastewater profit	1.7	2.2	3.3	3.4	N/A
Constructions profit	N/A	N/A	N/A	N/A	10.7
Concession profit	N/A	N/A	N/A	N/A	22.0
Group operating profit	-27.7	-1.2	1.0	18.3	33.6
Net profit	-27.8	4.3	-7.8	11.9	26.1
EPS (MYR)	-0.10	0.02	-0.02	0.02	0.05

In 2009 reporting was changed from water and wastewater divisions to construction and concessions. 2005 is for the 17 month period ended 31 December 2005

SEB has projects serving 2.8million people in Vietnam and China.

**Vietnam**

1999	Ho Chi Minh City	20 year O&M	400,000 water
------	------------------	-------------	---------------

In Vietnam, SEB was part of the Malaysian consortium involved in the USD35.8million 100,000m<sup>3</sup> per day Binh An Water Supply Scheme for the Thuan An District of Hi Chi Minh City. The O&M element runs for 20 years from 1999.

**China**

Contract work and awards in 2009 increased the total water delivery capacity from 380,000m<sup>3</sup> per day to 900,000m<sup>3</sup> per day. In April 2008, SEB signed a two year cooperation agreement with Shenzhen Hanyang Investment Holding Co to develop water, wastewater and waste management projects in China. Shenzhen Hanyang has operations in twelve cities across the PRC.

2009	Yizheng	30 year BOT	100,000 water
------	---------	-------------	---------------

Yizheng City is in Jiangsu Province. The Jiangsu Salcon Water & Environmental Development Co joint venture water treatment facility will deliver 50,000m<sup>3</sup> of water per day.



2005	Chenggong Country	30 year BOT	120,000 water
------	-------------------	-------------	---------------

Salcon Yunnan (HK), a 100% held subsidiary of holds 60% of a concession to construct and operate a 20,000m<sup>3</sup> per day expandable to 60,000m<sup>3</sup> per day water treatment plant and managing the distribution services for the district of Chenggong, Kunming City. Chenggong is to house the new Kunming Municipal Government administrative buildings, at least 11 universities and a logistics centre for flowers and vegetable exports.

2006	Haining	30 year BOT	600,000 water
------	---------	-------------	---------------

Salcon Zhejiang (HK) holds 60% of a joint venture to build and operate a 300,000m<sup>3</sup> per day water treatment plant in two 150,000m<sup>3</sup> per day phases, the first was completed in November 2007 and the second will enter service in 2010.

2008	Nan An City	30 year BOT	1,000,000 raw water
------	-------------	-------------	---------------------

Salcon Fujian (HK) holds 65% of a consortium for a BOT project to supply raw water to Guan Qiao, Shui Tou and Shi Jing three towns in Nan An City in Fujian. The two phases will build a 48km pipeline to provide 345,000m<sup>3</sup> of raw water per day at a total cost of MYR368million. The first phase (170,000m<sup>3</sup> per day) was completed in 2009.

2004	Changle County	50 year BOT	250,000 water
------	----------------	-------------	---------------

The Shandong Salcon Changle Water Supply Company holds 75% of the equity of the Shandong Changle Salcon Water Supply Company, which has a 50 year water provision services concession for Changle County in Shandong. The stake was acquired for USD1.44million. The contract started in April 2005, involving managing a 20,000m<sup>3</sup> per day water treatment plant and building a second one with a similar capacity. In 2008, the contract was extended to involve the construction of a new 100,000m<sup>3</sup> water treatment plant, which was completed in 2009.

2006	Changle County	Acquisition	200,000 wastewater
------	----------------	-------------	--------------------

Shandong Salcon Changle Water Supply Company acquired the Shandong sewage treatment plant in April 2005. A 20,000m<sup>3</sup> per day wastewater works (subsequently upgraded to 40,000m<sup>3</sup> per day) is being taken over.

2008	Changle County	30 year BOT	Raw water
------	----------------	-------------	-----------

Shandong Salcon Changle Water Supply Company will invest MYR109million in a BOT project to supply raw water from Gaoya Reservoir 38km to a new 100,000m<sup>3</sup> of water treatment works which was built by Salcon in 2009.

2005	Linyi	30 year BOT	350,000 water
------	-------	-------------	---------------

In November 2005, a Strategic Partnership Agreement for the development of a 0.15million m<sup>3</sup> per day water supply project in Linyi City, Shandong Province was signed. Salcon's other shareholders and the Linyi Municipality Industrial Product Jin Yin Real Property Development Company Ltd, China and the Linyi Municipality Water Supply Company. This is a 30-year concession to design, construct, operate, maintain, distribute potable water, with an estimated project cost of MYR600million. The JV company will have an initial registered capital of MYR200million.

**Contact Details**

Name: Salcon Engineering Berhad  
Address: 15<sup>th</sup> Floor, Periaran Summit,  
Persiaran Kewajipan, USJ 1,  
47600 UEP, Subang Jaya, Selangor, Malaysia  
Tel: 6(03) 8024 8822  
Web: [www.salcon.com.my](http://www.salcon.com.my)

Dato Seri Goh Eng Toon (Chairman)  
How See Hock (CEO)  
Dr Teoh Seng Foo (President)

**SYNERGY HEIGHTS SHSB**

EMS Energy sold Eco Water to Synergy Heights SHSB in November 2009 for USD1. Eco Water (EW) provides sewage and effluent treatment systems and services for municipal and industrial customers, with all of 2005 revenues being accounted for by these services. The company was founded in 1995 to provide wastewater treatment services to the Malaysian rubber industry. Almost all activities continue to be in Malaysia, which accounted for 98% of turnover in 2005. Currently activities are mainly based in southern Malaysia. China has been identified as the principal target market. Revenues (mainly water related) from Eco Water Technologies in Malaysia fell from USD11.6million in 2005 to USD5.3million in 2007. The Eco Water activities were renamed Sewage Treatment Services (STS) and Industrial Wastewater Treatment Services (IWTS).

**Eco Water – Revenues**

<b>FY 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
STS (Sewage treatment systems)	10.14	8.55	4.12	N/A	N/A
IWTS (Industrial effluent systems)	1.69	6.73	2.54	N/A	N/A
Water treatment systems	0.00	0.00	0.00	N/A	N/A
<b>Total</b>	<b>10.83</b>	<b>15.28</b>	<b>6.66</b>	<b>3.14</b>	<b>1.43</b>

2007 and subsequent results are partial due to the segment being discontinued.

Industrial customers vary year by year due to the relatively short term nature of contracts. The main customer is the Ramatex Berhad Group, which accounted for 13.5% of 2000 turnover and 3.3% in 2002 including EW's activities in Namibia. In all, 17 industrial customers have accounted for 5% or more of group turnover in any one year between 2000 and 2002.

In June 2004, Eco Water entered into a joint venture with China Yunnan Lanping TL Hydraulic Power Co., Ltd to incorporate a joint venture company in Yunnan (Yunnan Tian Long Eco Water Hydro Investment Co., Ltd) to seek business in water & wastewater treatment and environmental related projects and energy such as hydro power. Eco Water is initially subscribing CNY6million to the JV, which will have a registered capital of CNY86million, mainly accounted for by debt finance. Currently, the project is awaiting local approval before construction can commence.

**Contact Details**

Name: Synergy Heights SHSB  
Address: Suite 6.1A, Level 6,  
Menara Pelangi, Jalan Kuning,  
Taman Pelangi, 80400 Johor Bahru, Malaysia

**TALIWORKS CORPORATION**

Taliworks Corporation (TC) has been involved in the management, operation and maintenance of water treatment plants and the supply of treated water since Malaysia's first privatisation in 1987. It supplies 1,039.5million m<sup>3</sup> per day of water to the state of Selangor, the federal territory, and Langkawi Island, serving 2million people through the operation of six water treatment plants.

TC's Malaysian water companies are as follows:

[1] Sungai Harmoni (100% held): Sungai Selangor Phase 1. One WTW, 950million L/day capacity, expires 2030. Output in 2009 was 707million L/day, compared with 733million L/day in 2007 due to reduced customer demand.

[2] Taliworks Langkawi (100% held): Five WTWs in Langkawi Island & Perlis, 89.5million L/day capacity; granted in 1995 and expires 2020. This includes 20,650 customer accounts. Sales were 44million L/day in 2009 compared with 42million L/day in 2007.

**Taliworks Corporation, profit and loss account**

Y/E 31/12 (MYR)	2005	2006	2007	2008	2009
Water treatment	126.5	131.6	126.3	135.9	135.5
Total turnover	196.1	142.9	191.0	226.4	158.9
Pre-tax profit	57.4	50.3	46.7	59.4	51.0
Net profit	44.1	35.7	33.7	46.3	39.0
Earnings per share (Sen)	12.5	9.8	9.0	12.2	10.6

**China**

2003	Guanghan	30 year BOT	200,000 wastewater
------	----------	-------------	--------------------

Guanghan San Xin Dui is a 50,000m<sup>3</sup> per day wastewater treatment works in Sichuan Province, which is operated by Puresino (Guanghan) Water, a 56% held associate of Taliworks. The facility entered service in 2007 and ran at 61% of design capacity in 2009, a 13% increase on 2008.

In January 2010 the company acquired a 70% stake in Eco3 Technology and Engineering Pte Ltd, an industrial wastewater plant operator. In October 2009, Eco3 entered into a 30 year BOT agreement with Yinchuan City Ningdong Energy Chemical Industrial Zone Management Committee, for the construction and management of the Linhe integrated industrial park wastewater and recycled water treatment plant in Ningxia province. The proposed CNY70million plant has a wastewater treatment capacity of 50,000m<sup>3</sup> per day for Zone A and will start operations in 2011.

**Contact Details**

Name: Taliworks Corporation  
 Address: No. 28, Jalan Wan Kadir 1, Taman Tun Dr. Ismail  
 60000 Kuala Lumpur, Malaysia  
 Tel: +60-3-7725-7110  
 Fax: +60-3-7725-7099  
 Web: [www.taliworks.com.my](http://www.taliworks.com.my)  
 Web: [www.saj.com.my](http://www.saj.com.my)

Y Bhg Dato Haji Karim bin Munisar (Chairman)  
 Y Bng Dato Lim Chee Meng (Deputy Chairman)  
 Tuan Haji Abdul Rahman Bin Haji Siraj (CEO)  
 Lim Chee Meng (Director)

**YTL CORPORATION BHD**

YTL Corporation Bhd (YTL) has interests in power generation, construction contracting, cement manufacture, property development and hotels, and resorts and leisure. YTL Power International (61% held by YTL) is one of the largest independent power producers in South East Asia and has investments in regulated utilities in Australia.

**YTL Corporation Bhd, profit and loss account**

Y/E 06/12 (MYRmillion)	2005	2006	2007	2008	2009
Water & sewerage turnover	2,328	2,369	2,649	2,786	2,511
Total turnover	4,937	5,496	6,015	6,550	8,892
Pre-tax profit	1,257	1,470	1,556	1,830	2,288
Net profit	558	698	701	770	834
Earnings per share (Sen)	40	49	51	52	54

YTL acquired Wessex Water Plc (WW) for GBP1,240million in May 2002 when WW was sold by Enron. This is the first case of a company based in the developing economies acquiring a water and sewerage company from the developed world. In July 1998 Enron agreed terms with WW for a recommended cash offer for WW. The offer valued WW at GBP1.7billion: GBP1.36billion for WW's share capital and WW's net borrowings, which were GBP325million on March 31 1998.

It is understood that YTL has been examining the potential for developing projects in Asia.

**Wessex Water Services Ltd, profit and loss account for appointed businesses**

Y/E 31/03 (GBPmillion)	2006	2007	2008	2009	2010
Water turnover	N/A	123.8	138.4	N/A	N/A
Sewerage turnover	N/A	237.6	252.3	N/A	N/A
Turnover	340.5	361.4	390.7	420.6	438.2
Operating profit	152.5	165.0	191.9	203.4	216.7
Pre-tax profit	84.2	100.4	122.9	118.7	152.9

Wessex Water supplies water to 1.30million people and sewerage services to 2.60million people in south west England. Leakage was eased from 73million L/day since 2004-07 to 72million L/day in 2008 and 2009, which at 20% is seen as 2million L/day below the economic level. During 2005-10, the emphasis in terms of projects has shifted from sewage treatment towards drinking water quality and avoiding sewage flooding.

**Contact Details**

Name: Wessex Water Services Ltd,  
Address: Claverton Down Road, Bath BA2 7WW.  
Web: [www.wessexwater.co.uk](http://www.wessexwater.co.uk)

Colin Skellet (Chairman)

Name: YTL Corporation Bhd  
Address: 11<sup>th</sup> Floor, Tiong Lay Plaza,  
55 Jalan Bukit Bintang, 55100, Kuala Lumpur, Malaysia.  
Tel: +60-3-2142-6633  
Fax: +60-3-2141-2703  
Web: [www.ytl.com.my](http://www.ytl.com.my)

Y Bhg Tan Dato Seri (Dr) Yeoh Tiong Lay (Chairman)  
Tan Dato Seri (Dr) Francis Yeoh Sock Ping (MD)  
Bhg Dato Yeoh Seok Kian (Deputy MD)

**MEXICO****AQUASOL MORELIA**

Aquasol is a privately owned Mexican water engineering and operations company founded in 2000 to bid for municipal water treatment concessions in Mexico. In 2003-04, the company gained two concessions and was amongst the finalists for at least another two bids.

In December 2003, Aquasol secured a 20 year, USD30million BOT concession for a 1,200L per second (103,500m<sup>3</sup> per day) agricultural water plant in Michoacan state capital Morelia. The facility will enter into service by the end of 2004. In January 2004, Aquasol secured a USD25million, 20 year BOT concession in Hidalgo State's capital Pachuca. The 400L per second (34,500m<sup>3</sup> per day) Pachuca plant will provide two levels of water quality: one for agricultural use and another for industrial customers. Operations are expected to begin later in 2004. In each case, Aquasol is working in a 50-50 JV with Tecnologia Intercontinental (Ticsa, industrial wastewater treatment plant engineering) based in Mexico City, who have built some 200 municipal and industrial water and wastewater treatment plants.

Aquasol strategy is to bid for 20 year BOT concessions because of the federal government's commitment to provide up to 40% of project financing. Typically, private equity makes up another 25% of costs and loans account for the remaining 35%. The company aims to bid for other projects in Latin America when similar financial packages are made available.

**Contact Details**

Name: Aquasol SA de CV  
Address: Paseo del Carmen 30, Col.  
La Asuncion, 500000 Toluca, Mexico  
Tel: + 722 271 02 73

Alfredo Marin Pasos (Operations Director)  
Rigoberto Mena (Manager)

**PHILIPPINES****BENGUET CORPORATION**

Benguet Corporation was founded in 1903 and is the oldest mining company in the Philippines. Due to the long term decline of its copper and gold mining activities, the company has decided to enter the water concessions market in the Philippines.

**Benguet Corporation, profit and loss account**

<b>FY 31/12 (PHPmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Net sales	307	257	299	345	241
Operating income	-134	-172	435	372	338
Net loss	-270	-358	271	-483	-185
Earnings per share (PHP)	-2.37	-3.14	2.31	-3.20	-1.23

In 2003, Benguet gained a 136 month contract to manage the Kailangan, Bukidnon water system in Mindanao state in the Southern Philippines. Kailangan had a population of 27,000 in 1995, with 940,000 living in the province of Bukidnon. This was handed over at the end of 2005.

In 2005, Benguet also gained a similar contract serving Itogon and Baguio City, the capital of north Luzon and the nation's summer capital. The Baguio City water project is estimated to cost USD60million and will include the construction and development of a water reservoir and distribution network for the entire city, providing 50million litres of water a day. Baguio City had a population of 250,000 in 2000, with the population growing at 5% pa. Benguet has been seeking to provide additional water to the city since 1995, using the former Antamok open mine in the area as a reservoir with a potential capacity of 9million m<sup>3</sup> to provide 50,000m<sup>3</sup> of water per day. Delays in the project caused the cost to rise and it was annulled by the Baguio Water District in 2007, and this is currently pending in court (No update at time of publishing).

**Contact Details**

Name: Benguet Corporation  
 Address: 3F, Universal Re-Building, 106 Paseo de Roxas,  
 Makati City, 1226 Philippines  
 Tel: +63 632 812 1380  
 Fax: +63 632 752 0717  
 Web: [www.benguetcorp.com](http://www.benguetcorp.com)

Benjamin Philip G Romalodez (Chairman, President and CEO)  
 Salvador Pabalan (VP, Finance)

**MANILA WATER CO**

In 1997, Metro Manila gained the 25 year concession for operating Manila's East Zone, where 5.6million people live. 35% of the company's equity was sold when the company was Listed in 2005. United Utilities (UK) no longer has a shareholding in the company, and the main corporate shareholders are Ayala (Philippines, 32%), the World Bank's IFC (a 7% stake bought from United Utilities for USD15million in 2004) and Mitsubishi (7%, Japan, see company entry). The concession was extended from 2022 to 2037 in 2009.

**Manila Water Co, profit and loss account**

<b>Y/E 31/12 (PHPmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water – Manila	4,538.4	5,250.2	6,241.1	7,540.1	8,044.6
Water – Laguna and Boracay	0.0	0.0	0.0	0.0	20.0
Environmental Charges	464.9	532.1	637.3	889.9	980.2
Sewerage	279.8	308.1	348.7	384.8	396.8
Revenue from international contracts	0.0	0.0	0.0	16.5	23.7
Total revenues	5,763.1	6,784.7	7,331.9	8,913.6	9,532.6
Net profits	2,011.5	2,394.2	2,598.9	2,790.4	3,276.4
Earnings per share (PHP)	0.93	1.05	1.06	1.13	1.31
Billed water (MLD)	864	948	1,040	1,060	1,085
Non revenue water (%)	35.5%	30.3%	23.9%	19.5%	15.8%
People served (million)	5.2	N/A	5.6	N/A	6.0
Service connections (000)	458	N/A	589	684	736
Households connected (000)	600	892	986	1,032	1,086
Urban poor - connections (000)	141.0	170.2	214.0	N/A	N/A

A number of service quality targets have been set with mixed results. Near universal 24 hour water availability has been achieved since 2007, compared with 26% availability in 1996 and 58% availability in 1997. Household connected have increased from 325,000 in 1997 to 1,106,000 by 1Q 2010 an increase of 4million people being served. Under the Tubig Para Sa Barangay scheme, 644 projects have resulted in 1.6million people from 214,000 poor households (2007) have been connected to the water network since 1998, including 750,000 since 2005.

Capex in 2007 was PHP4.4billion, rising to PHP4.95billion in 2009. The World Bank funded USD85million Manila Third Sewerage project aims to boost sewerage coverage from 10% to 30% by 2010, connecting 3.3million people. A PHP187billion 2007-22 investment plan has been drawn up. The concession extension has been linked to PHP450billion in capital projects between 2010 and 2037. 49% of the company's loans are PHP denominated, the balance mainly being in JPY (36%) and USD(19%).

Sewerage and sewage treatment have made limited progress to date, and a Ps 50billion programme for service extension was implemented in 2009. 68,425 households were connected to the sewerage network by the end of 2009. Sewerage coverage has increased from 3% in 1997 to 12% by 2007. This is well behind original expectations. The current plan is to increase coverage to 30% by 2010 and 63% by 2022.

**New projects**

In 2009, two concessions outside the company's operating area have been gained: Laguna (Laguna Water, a 25 year concession 70% Manila Water, 2009 revenues of PHP63million, 17,721 connections and NRW at 54%) and Boracay (BIWC, 80% Manila Water, 25 years from 2010, with a 25 year extension option, 2009 revenues of PHP112million, 3,367 service collections and NRW at 40%). Boracay is a resort island and Laguna is a province near to Manila, the concession covering a 13,000Ha service area, with a 2010 population of 600,000, which is forecast to grow to 1million by 2014.



**India**

A joint venture has been developed with Jindal Water of India (Jindal Aquasource, see company entry) to develop projects in Rajasthan, Gujarat and Maharashtra. Manila Water has also established an office in Singapore for its future international activities.

2003	Tirupur	30 year BOT	1.6million water treatment
------	---------	-------------	----------------------------

This was the first large scale private sector water provision project in India. It was originally awarded to Mahindra Water Utilities Limited (UU Australia and Bombay's (Mumbai's) Mahindra and Mahindra Ltd), serving the capital of Tamil Nadu. This involves the construction of a 185Ml/day water treatment plant, pipeline, service reservoirs and a wastewater treatment plant and pumping stations at a total cost of USD220million. The WTP entered service in 2005 and provides water for the textile manufacturers and over 1.6million residents in the Tirupur municipal area and surrounding villages. UU has sold its stake in the project and Manila Water has been involved in the project since 2007.

**Vietnam**

2008	Saigon	5 year O&M	1.5million leakage reduction
------	--------	------------	------------------------------

This is a USD15million contract with the Saigon Water Corporation covering 25% of the city of six million. Manila Water is working with Mitsubishi (Japan) and REE Corporation to develop similar contracts in Vietnam, focussing on Ho Chi Minh City.

The company has rehabilitated the Magallanes wastewater treatment plant which processes up to 40million L/day of wastewater. It has built 30 sewage treatment plants across the area and two more are to be constructed as sewerage connections rise from 3% in 1997 and 12% in 2007 to 16% in 2008 and 30% by 2012.

**Contact Details**

Name: The Manila Water Company Inc  
 Address: 489 Katipunan Road,  
 Quezon City, 1105 Philippines  
 Tel: (632) 926 7999  
 Web: [www.manilawater.com](http://www.manilawater.com)

Antonio Aquino (President)  
 Fernando Zobel de Ayala (Chairman)  
 Luis Juan B Oreta (Finance Director)

## METRO PACIFIC INVESTMENTS

The Metro Pacific Investment Co (MPIC) is an investment holding company. In June 2008, MPIC acquired shares in Maynilad from First Pacific and Ashmore Funds for USD197million taking its interest to 51%. MPIC now holds 58% of Bidco (DMCI-MPIC Water Co), the company which gained the 84% stake in Maynilad Water from MMWSS in January 2007. D.M. Consunji holds the other 42%.

Maynilad Water Services, Inc. (MWSI) was awarded the western half of the Metro Manila water distribution concession in August 1997. MWSI has suffered from a mid concession-life crisis when MWSI took on 90% (USD800million) of MWSS' foreign debt, which between 1997 and 2000 doubled in Peso terms from PHP20billion to PHP40billion due to the Peso's weakness. Although MWSI gave notice to halt the concession in March 2003, continuing arbitration and associated legal processes have meant that it continues to run under its current structure. The November 2003 and April 2004 agreement would have resulted in a write-off of PHP3.8billion (PHP3.2billion in equity and PHP629million in debt) and the loss of control in MWSI. On April 29, 2005, MWSI and its bank creditors, along with the MWSS executed a Debt Capital and Restructuring Agreement. As part of this, MWSS acquired 83.97% of the shares of MWSI, with Ondeo holding the remaining shares. In return, the creditors released it from loan obligations worth a total of USD220million.

### MPIC, profit and loss account

Y/E 31/12 (PHPmillion)	2005	2006	2007	2008	2009
Maynilad – water	N/A	N/A	N/A	6,420	8,575
Maynilad – sewerage	N/A	N/A	N/A	1,387	1,624
Maynilad – total revenues	N/A	N/A	N/A	8,245	10,619
MPIC - total revenues	2,173	1,799	7,006	5,041	16,108
Maynilad – net profit	N/A	1,004	1,255	1,994	2,825
MPIC – net profit	209	-701	203	526	2,300
Earnings per share (PHP)	0.19	-0.74	0.06	0.10	0.19
Billed water (million m <sup>3</sup> )	N/A	262	286	315	350
Non revenue water (%)	69%	68%	66%	64%	60%
Service connections (000)	660,000	677,985	703,519	762,315	814,645
Sewage connections (000)	N/A	N/A	67,420	67,450	N/A

The West Zone concession area covers eleven cities in Metro Manila (Pasay, Caloocan, Las Piñas, Parañaque, Valenzuela, Muntinlupa, Manila except portions of San Andres and Sta. Ana, some parts of Makati and Quezon City, Malabon and Navotas) and one city (Cavite City) and five towns in Cavite province (Rosario, Imus, Noveleta, Bacoor and Kawit). There were 831,578 customers in March 2010, or 6.6million people (5.9million in 2007). In February 2008, Maynilad repaid its outstanding USD232million loan and the company was released from administration. In 2007, 72% of the zone's 7.52million people were covered. 24 hour coverage for the entire concession area is planned for 2012 (58% in 2008 and 60% in August 2009), along with lowering NRW to 40% (53% in 2Q 2010). A PHP44billion capex programme is underway from 2008 to 2012, with PHP8billion for 2008 against PHP5billion in 2007. In April 2010, the concession was extended by 15 years to 2037. This means that the capital spending planned to the end of the concession has been raised from PHP208billion to PHP564billion.

### Contact Details

Name: Metro Pacific Investments  
 Address: 10/F MGO Building, Legazpi cor. Dela Rossa Street,  
 Legazpi Village 0721 Makati City, Philippines  
 Tel: (632) 888 0888  
 Web: [www.mpic.com.ph](http://www.mpic.com.ph)

Manuel V Pangilian (Chairman)  
 Jose Ma K Lim (President and CEO)  
 Andrew G Shepherd (CFO)  
 Herbert Consunji (Interim President, Maynilad)

**SINGAPORE****ASIA ENVIRONMENT HOLDINGS LTD**

Asia Environment Holdings (AEH) was listed on the Singapore Stock Exchange in November 2003. AEH operates in China under the Penyao trade name and since its foundation in 1984 has progressively moved from water engineering to turnkey contracting to BOT contracts. More than 300 projects have been completed to date. Since 2001, 15 BOT and TOT contract awards in China have been identified, including water provision contracts for 1.65million people and wastewater treatment contracts covering 2.625million people as well as a series of industrial wastewater treatment contracts.

**AEH, profit and loss account**

<b>Y/E 31/12 (CNYmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water engineering turnover	41.3%	27.1%	20.1%	80.2	99.0
Turnkey projects turnover	57.6%	72.9%	79.1%	293.1	469.2
BOT turnover	1.1%	0.0%	0.8%	19.2	42.7
Group turnover	225.3	272.6	483.5	393.1	614.6
Net profits	43.2	64.4	81.8	53.4	30.3
Earnings per share (Fen)	15.03	22.28	25.36	13.56	7.98

In 2005-07, segmental figures were provided in percentage terms.

**Project status, 31-12-2009**

The following progress projects at the construction and commissioning stage are all expected to enter service during 2010.

<b>Contract</b>	<b>Status</b>	<b>Capacity (m<sup>3</sup>/day)</b>
Xining	Operating	85,000
Jingdezhen - XGZ	Operating	80,000
Fenhu	Operating	25,000
Lishui	Operating	20,000
Xiuning	Operating	20,000
Wangcheng	Operating	40,000
Nanchang	Operating	200,000
Jinshan	Commissioning	200,000
Nantong	Commissioning	25,000
Jiangning	Commissioning	40,000
Danyang	Construction	140,000
Yueyang – NJG	Construction	100,000
Yueyang – EC	Construction	70,000
Jingdezhen – HTI	Construction	40,000
Zhoukou	Construction	50,000

2009	Zhoukou	30 year BOT	250,000 water
------	---------	-------------	---------------

The contract involves operating the existing 50,000m<sup>3</sup>/day water treatment plant serving Zhoukou City in Henan Province and constructing an extension to the plant adding 70,000m<sup>3</sup>/day to its treatment capacity. The Zhiukou Penyao Water Supply Co is 100% held by AEH and has a registered capital of USD9.8million.

2009	Yueyang	25 year BOT	350,000 water & wastewater
------	---------	-------------	----------------------------

The contract involves operating the existing 100,000m<sup>3</sup>/day water treatment plant serving Yueyang City in Henan Province and constructing an extension to the plant adding 70,000m<sup>3</sup>/day to its treatment capacity. A 50,000m<sup>3</sup>/day wastewater treatment plant is to be constructed, serving an estimated 250,000 people. The Yueyang Penyao Water Supply Co is 100% held by AEH.

2009	Jingdezhen	30 year BOT	Industrial wastewater
------	------------	-------------	-----------------------

This involves developing an industrial wastewater treatment plant serving the Jingdezhen High-Tech Industrial Park in Jiangxi Province in two equal 40,000m<sup>3</sup>/day phases. It will be run by a wholly owned company, Jingdezhen Dapeng Water Treatment Pte Ltd.

2009	Xiuning	30 year BOT	100,000 wastewater
------	---------	-------------	--------------------

In 2009, AEH's Xiuning Water acquired 60% of the equity of Huangshan Xiuning Fuda Wastewater Treatment Pte Ltd, with Shanghai Fuda Lefumen Environmental Engineering holding the remaining 40%. Construction of a 20,000m<sup>3</sup>/day wastewater treatment plant serving Xiuning County, Huangshan City in Anhui was completed in 2009.

2008	Danyang	30 year BOT	500,000 water
------	---------	-------------	---------------

In July 2008, AEH entered into a Preliminary Agreement with Danyang Municipal Government regarding a BOT project involving a group of six wastewater treatment plants in Fangxian, Daoshu, Erling, Xinqiao, Houxiang and Shitu towns in Danyang City, Jiangsu Province. This involves the construction and operation of six wastewater treatment plants and the installation of connecting pipes of approximately 48km long. The total planned capacity of the wastewater treatment plants is 140,000m<sup>3</sup>/day, with a Phase 1 capacity of 55,000m<sup>3</sup>/day. The facility will enter service in 2010.

2008	Xining	30 year BOT	350,000 wastewater
------	--------	-------------	--------------------

In May 2008, AEH's Xining Penyao Wastewater Treatment gained a concession to acquire, expand and operate a wastewater treatment plant in Xining City, Qinghai Province. This involves an existing wastewater treatment plant with a capacity of 85,000m<sup>3</sup>/day in 2009 and expanding its treatment capacity to 135,000m<sup>3</sup>/day. The investment value of the project is approximately CNY238million.

2008	Anqing	30 year BOT	Industrial wastewater
------	--------	-------------	-----------------------

A contract for the Anqing Economic Development Zone for Anqing, Anhui province for a 30 year concession involving the construction of a 10,000m<sup>3</sup>/day wastewater treatment plant. In 2009, it was announced that the concession was to be terminated. Conditions have yet to be finalised.

2007	Lishui	28.5 year BOT	100,000 wastewater
------	--------	---------------	--------------------

In November 2007, AEH's 100% held Lishui Water Investment Ltd gained a concession to build and operate a wastewater treatment plant in Lishui county, Nanjing city, Jiangsu province for a wastewater treatment plant with total capacity of 40,000m<sup>3</sup>/day.

2007	Jingdezhen	20 year BOT	250,000 wastewater
------	------------	-------------	--------------------

Jingdezhen City is in Jiangxi Province. The project involves the construction of a wastewater treatment plant with a total capacity of 80,000m<sup>3</sup>/day. The total investment of the project is estimated at CNY78million and AEH holds 20% of the project company.

2007	Wangcheng County	27 year BOT	125,000 wastewater
------	------------------	-------------	--------------------

AEH's 100% held Jiangsu Penyao Environmental Engineering Contract Co. has entered into a BOT with Wangcheng County Government to build and operate a wastewater treatment plant in Wangcheng County, Hunan Province. A wastewater treatment plant with total capacity of 40,000m<sup>3</sup>/day entered service in 2009. The total investment of the project is CNY57million.

2007	Shanghai	26 year BOT	Industrial wastewater
------	----------	-------------	-----------------------

In April 2007 an AEH associate (20% held) gained a BOT with the Shanghai Jinshan Zone Industrial Park II to build and operate a wastewater treatment plant in the Jinshan Industrial Park II. This

involves the construction of a wastewater treatment plant with total capacity of 50,000m<sup>3</sup>/day, of which the Phase 1 capacity is 25,000 m<sup>3</sup>/day. The total investment for the first phase of the project is estimated at CNY100million.

2007	Suzhou	20 year BOT	Industrial wastewater
------	--------	-------------	-----------------------

A BOT for a wastewater treatment facility with a total capacity of 50,000m<sup>3</sup> per day and the laying of a wastewater piping network within the Fenu Economic Development Zone. The first phase, costing CNY95million involves a 25,000m<sup>3</sup> per day wastewater treatment plant and laying of the wastewater piping network, completed in 2009. AEH holds 16% of the contract company's equity.

2006	Harbin	20 year BOT	Industrial water & wastewater
------	--------	-------------	-------------------------------

In October 2006, a CNY185million contract for the Harbin Binxi Economic Development Zone was signed. When complete, the plant will have capacity to treat 60,000m<sup>3</sup> per day of water and to treat 50,000m<sup>3</sup> per day of wastewater discharged by the Harbin Binxi Economic Development Zone. Phase I of the project is estimated to be around CNY190million for half the capacity for both facilities.

2006	Zhangzhu	25 year TOT	100,000 wastewater
------	----------	-------------	--------------------

AEH's Yixing Penyao Water Company gained the TOT in September 2006 for Zhangzhu Town, Yixing City, Jiangsu Province, the People's Republic of China. This involves the acquisition of a wastewater treatment plant for CNY16million with a treatment capacity of 10,000m<sup>3</sup>/day and operating the plant for a 25 years concession period. The total revenue to be derived over the concession period amounts to CNY114.6million. AEH has the right to develop the 2nd and 3rd phase of the wastewater treatment plant, each phase expanding the treatment capacity by 10,000m<sup>3</sup>/day. The Company intends to fund the acquisition from its internal resources and bank borrowings.

2005	Pizhou	25 year BOT - suspended	250,000 water
------	--------	-------------------------	---------------

In September 2005, AEH gained a CNY82million 25 year BOT contract for building a 100,000m<sup>3</sup> per day water treatment works serving Pizhou City: in Jiangsu Province. There has been a dispute between the consortium and the municipality over construction costs, which went into an arbitration procedure in 2009. In November 2005, a joint venture was set up between AEH (25%), Dayen (50%, see Company Entry) and Lionguard (25%, Richfull Holdings of HK, an infrastructure investment company) for the project.

2004	Nanchang	25 year BOT	750,000 wastewater
------	----------	-------------	--------------------

The Nanchang wastewater treatment BOT was signed in 2004. It covers the construction of a 200,000m<sup>3</sup> per day wastewater treatment plant, with a 20 year operations contract. Construction was 62% complete by the end of 2005 and the facility is entering service during 2006 with a total investment of CNY171million. AEH holds 12.88% of the operating company. The 200,000m<sup>3</sup> per day facility entered service in November 2007. The contract will generate revenues of CNY625million. AEH's Nanchang Water Holdings Private Limited acquired the outstanding 49% of Nanchang Penyao Water Supply Co. in November 2007.

2004	Nantong	25 year BOT	550,000 water
------	---------	-------------	---------------

In July 2004, AEH signed a CNY398million deal to build a water treatment plant in Nantong City in Jiangsu province. The 25 year BOT project will treat and supply 200,000m<sup>3</sup> of water daily to the city via a 70km pipeline. AEH have an option to construct two more phases to provide extra capacity of 400,000m<sup>3</sup> of water per day. In 2009 Nantong Water, AEH's associate company has held 78% of Nantong Penyaoi, the contract company.

**Contact Details**

Name: Asia Environment Holdings Limited  
Address: 65 Chulia Street, 39-08 OCBC Centre,  
Singapore 049513, Singapore  
Tel: +65 6309 7488  
Fax: +65 6748 9487  
Web: [www.asiaenv.com](http://www.asiaenv.com)

Wang Chun Lin (Chairman)  
Wang Hong Chun (CEO)  
Soh Yeow Hwa (CFO)

**SINGAPORE****ASIA WATER TECHNOLOGY LTD**

Asia Water Technology (AWT) was listed on the Singapore Exchange in 2005. The company operates primarily in China through its Kaidi Water subsidiary, which it incorporated in 1996. In the wake of financial problems encountered by AWT, Shanghai Industrial Holdings (China, see company entry) made a significant investment in the company and gained 76.8% of its equity. This meant that AWT was discharged from receivership in 2010 and has resumed trading on the Singapore Stock Exchange.

**AWT, profit & loss account**

Y/E 31/12 (RMB million)	2006	2007	2008	2009
Water treatment projects	N/A	N/A	291.0	221.3
Wastewater treatment projects	N/A	N/A	67.2	83.0
Other activity	N/A	N/A	28.5	17.6
Group turnover	471.8	486.4	386.7	321.9
Net profits	76.8	53.3	-17.9	-180.5
Earnings per share (RMB cents)	N/A	N/A	-8.91	-91.14

2004	Bengbu Xinya	20 year TOO	200,000, water
------	--------------	-------------	----------------

A groundwater treatment plant costing RMB11million located in Bengbu, Huaiyuan District in Anhui province. The city has a total of 1.3million people and the facility has a capacity of 10,000 tonnes per day.

2004	Wuhan Xincheng	30 year BOT	Industrial wastewater
------	----------------	-------------	-----------------------

This is an industrial wastewater treatment project serving the Wuhan City Economic Zone in Hubei. The plant cost RMB73million and has an initial capacity of 60,000 tonnes per day, expandable to 120,000 tonnes per day.

2004	Tianmen Kaidi	25 year TOT	500,000, water
------	---------------	-------------	----------------

This is the sole provider for Tianmen, a city with 1.68million people in Hubei. The RMB 193million 100,000 t/day plant can be expanded to 200,000 tonnes per day.

2004	Tianmen Kaidi Xinnong	25 year TOT	130,000, water
------	-----------------------	-------------	----------------

The company's second facility in Tianmen in Hubei province, serving 130,000 people in 81 villages surrounding the city. It cost RMB29million to develop.

2004	Wuhan Hanxi	25 year BOT	1million, wastewater
------	-------------	-------------	----------------------

The Wuhan Hanxi Waste Water Treatment plant in Hubei has a 400,000 tonnes per day capacity at a cost of RMB460million . A second phase will double the project's capacity.

2004	Wuhan Dongxihu	30 year BOT	Wastewater management
------	----------------	-------------	-----------------------

A sewerage management project costing RMB300-330million for the Dongxihu District of Wuhan in Hubei. Wastewater collected is to be sent to the company's Wuhan Hanxi WWTW.

2008	Huangshi Kaidi	27 year BOT	1,000,000, wastewater
------	----------------	-------------	-----------------------

Upgrading a 125,000 tonnes per day WWTW in Huangshi City in Hubei to serve the entire population of the city at a cost of RMB153million.

2008	Wuhan Huang-Pi	30 year BOT	1,110,000, water
------	----------------	-------------	------------------

A RMB 645-840million project managing seven WTWs and 982million of piping for all connected residents in the city of 1.11million in Hubei.

2007	Lvliang Xinya	50 year BOO	Industrial water
------	---------------	-------------	------------------

This project is designed to provide water for two coal mining and other related projects in Shanxi. The treatment capacity will be 55,000 tonnes per day with a total investment of RMB 256million.

2005	Taizhou Kaidi	20 year BOT	Industrial wastewater
------	---------------	-------------	-----------------------

This project serves the Zhejiang Pharmaceutical Park in Linhai City in Zhejiang. It has a current treatment capacity of 12,500 tonnes per day and can be expanded at a total cost of RMB100million to 50,000 tonnes per day over four phases.

#### Contact Details

Name: Asia Water Technology Limited  
 Address: 36 Robinson Road, 14-06 City House,  
 Singapore 068877, Singapore  
 Tel: +65 6538 2598  
 Fax: +65 6538 2896  
 Web: [www.asiawatertech.com](http://www.asiawatertech.com)

Cai Yutian (Chairman)  
 Feng Jun (Director)  
 Liu Yujie (Director)  
 Huang Hanguang (President, Kaidi Water)



**BOUSTEAD SINGAPORE LTD**

Boustead Singapore is an investment company specialising in a range of engineering applications, information technology and investment services and dates back to 1828. Engineering activities include process control systems. Water engineering activities are carried out through Salcon Limited (not related to Salcon Bhd., see Malaysia company entry), of which Boustead acquired 63% in 2003, increasing this to 100% in 2006. Salcon Limited has to date completed 800 water and wastewater treatment projects in 57 countries, mainly in Asia and the Middle East.

The water engineering division made a loss of SGD8.4million on revenues of SGD26.8million in 2009.

<b>Y/E 31/03 (SGDmillion)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
Group turnover	289.3	343.9	438.3	516.6	438.4
Operating profits	54.4	44.2	66.4	50.7	60.2
Net profits	38.7	35.2	51.5	60.1	43.1
Earnings per share (Cents)	4.9	7.0	10.1	11.7	8.5

**Indonesia**

In July 2004 Boustead signed a Heads of Agreement with the Sultan of Yogyakarta, for the Government of Yogyakarta Province, Indonesia for a 25 year DBOT for the supply of treated water to the city of Yogyakarta and its sub districts of Sleman and Bantul with a total population of 2.2million people. Currently, just 19.8% of the Province is provided with potable water. With the completion of the whole project, it is expected that 60 to 70% of the population will be supplied.

The project is to be carried out in three phases. Phase 1 & 2 with a combined capacity of 300,000m<sup>3</sup> per day cost USD55million to develop and were completed at the end of 2009. Approval for Boustead's 51% investment in PT Citra Tirta Mataram was received in July 2005. The Engineering, Procurement and Construction (EPC) contract for the whole project will be carried out by Boustead's Water and Environmental Division, which includes Salcon Limited. The EPC portion of the contract is expected to generate material income for Boustead's Water and Environmental Division.

**China**

In July 2005, Boustead was awarded a CNY137million contract for the construction of a 40,000m<sup>3</sup> per day desalination facility serving Tianjin. The facility entered service in 2006, and Boustead is operating it for an unspecified period.

**Contact Details**

Name: Boustead Singapore Limited  
 Address: 63 Ubi Avenue 1, 06-01 Boustead House,  
 Singapore 408937, Singapore  
 Tel: +65 6747 0016  
 Fax: +65 6741 8689  
 Web: www.boustead.sg

Wong Fong Fui (Chairman and CEO)  
 Loh Kai Keong (CFO)  
 Saiman Ernawan (Deputy Chairman)

**DARCO WATER TECHNOLOGIES PTE**

Darco Water Technologies Pte (DWT) was listed on the Singapore Stock Exchange in July 2002 in order to improve corporate visibility when tendering for water contracts. The company was set up in 1999 by a group of individuals who had previously operated in the industrial water treatment sector. Target markets are Singapore, Malaysia, China, Taiwan, India, Indonesia and the Philippines.

**DWT, profit and loss account**

Y/E 31/12 (SGDmillion)	2005	2006	2007	2008	2009
Water engineering turnover	43.83	54.44	71.45	78.64	42.85
Water management turnover	9.25	11.71	14.45	18.02	15.63
Group turnover	55.25	68.91	87.56	97.37	58.83
Operating profits	8.35	5.05	7.15	-0.44	-2.91
Net profits	5.72	2.08	3.24	-2.31	-6.25
Earnings per share (Cents)	3.06	1.29	1.53	-1.08	-2.51

**China**

Revenues in China were SGD8.3million in 2008 and SGD17.2million in 2009.

2002	Deqing	25 year BOT	120,000 water
------	--------	-------------	---------------

DWT has expanded from developing water treatment systems into offering BOT contracts. The company gained a 22 year potable water treatment plant BOT contract in July 2002 for Deqing in Zhejiang Province, China. The contract was awarded to DWT's 75% held subsidiary Globe Environmental (70%) with two provinces holding the outstanding 30% of the Zhejiang Deqing Globe Water Treatment Co Ltd. This is for the provision of 60,000m<sup>3</sup> of water per day, serving 120,000 people. The SGD13.2million facility entered service in May 2006 after being held up by a dispute, which was mediated by the World Bank, and will generate revenues of SGD4-5million per annum.

2006	Deqing	25 year BOT	530,000 water
------	--------	-------------	---------------

In May 2006, two further 25 BOT projects serving the city were gained. [1] For the extension to the existing BOT project, with the second phase of the current BOT project being the same size as the first, 60,000m<sup>3</sup> of water per day. DWT plans to invest SGD9.6million in the project which will generate a total revenue of SGD60-75million over 25 years, or SGD4-5 million per year. [2] For a water treatment project with a capacity to produce 100,000m<sup>3</sup> a day. The estimated cost of investment for this project is SGD19.2million. The plant will supply water to residents and industries, with the major user of the water being a large brewery to be built in Deqing. The total revenue from the project is SGD82.5-105million over 25 years, or SGD3.5-4.2million per year. This project entered service in 2010. Further expansion is planned, bringing the eventual overall capacity to 320,000m<sup>3</sup> a day.

**Indonesia**

Revenues in Indonesia were SGD5.4million in 2008 and SGD4.9million in 2009.

2007	Bangka Island	20 year O&M	150,000 water
------	---------------	-------------	---------------

In October 2007, PT Darco Indonesia signed an agreement with Bangka Island for the Engineering Procurement & Construction (EPC), Operation & Maintenance (O&M) of a water treatment purification facility in Pangkalpinang City, Bangka Island, Indonesia, amounting to approximately IDR775billion (SGD130.8million). PT Darco shall receive IDR89.5billion (SGD15.1million) to upgrade the existing water treatment plant capacity from 12,000m<sup>3</sup>/day to a capacity of 36,000m<sup>3</sup>/day within 18 months, followed by a 20 year O&M contract, where PTDI shall receive 70% share of the revenue. The O&M contract sought to generate a total recurring revenue of approximately IDR980.5billion (SGD165.4million) for the partnership.

In May 2003, DWT paid USD3million to acquire a 10% stake in PT Air Bintan Biru (PTABB), with an option to increase this stake to 25%. PTABB was founded in September 2002 to develop water

resources and concessions in Riau province of Indonesia and seeks to supply water from the province to Singapore under a 25 year supply agreement. In early 2004 Darco Environmental (Philippines) Inc. secured a six year BOO contract for the supply of ultra-pure water to SunPower Philippines Manufacturing Ltd., a company engaged in the manufacture of solar cells.

### Taiwan

Revenues in Taiwan were SGD45.8million in 2008 and SGD15.9million in 2009.

2009	Taoyuan	35 year BOT	75,000, wastewater
------	---------	-------------	--------------------

A 15,000m<sup>3</sup> per day wastewater treatment for the Taoyuan County Government is to be developed in three phases: Phase 1 (7,500m<sup>3</sup> per day, 2009-11) and Phases 2 & 3 (3,750m<sup>3</sup> per day each, to 2016). Darco's 51% held company is to invest SGD79million in the project which is forecast to generate SGD298million in revenues.

2005	Hsin Chu	25 year BOT	150,000, wastewater
------	----------	-------------	---------------------

During 2005, DWT, in partnership with Taiwan's Leader Construction Co Ltd., gained the TWD1.66billion (SGD83.78million) turnkey contract awarded by the Interior Ministry of Taiwan for the engineering design, construction and commissioning of a 30,000m<sup>3</sup> per day wastewater treatment plant serving Hsin Chu City's Ker-Ya Municipal Water Resources Recovery Centre. DWT will run a five year operation and maintenance contract, worth SGD8.75million. The complete facility will have a 190,000m<sup>3</sup> per day cubic peak flow capacity. The O&M commenced in 2008.

### Contact Details

Name: Darco Water Technologies Pte  
 Address: 41 Loyang Drive, Singapore  
 508952, Singapore  
 Tel: +65 6545 3800  
 Fax: +65 6545 3770  
 Web: www.darcowater.com

Thye Kim Meng (Chairman, CEO and Managing Director)  
 Lee Sue Lin (Director, Process Engineering & Design)  
 Teh Swee Heng (Director, Business Development)  
 Lim Boon Kuan (CFO)

**HYFLUX LTD**

Hyflux Ltd designs, manufactures and operates water and wastewater treatment and conditioning systems. The company's membrane systems have been used on a variety of major desalination contracts. In recent years, the company has entered into a number of industrial water outsourcing contracts and BOT contracts. Its traditional customers have been the Singapore Public Utilities Board (PUB) and the Environment Ministry. The proportion of revenues in industrial projects shifted from 81% in 2004 to 44% in 2005 and to 11% in 2009 as various BOT projects entered their construction phase.

Between 2004 and 2008 Hyflux gained a series of water and wastewater treatment BOT contracts with a total treatment capacity of 870,000m<sup>3</sup> per day, which entered service between 2006 and 2010. Hyflux is developing approximately 45 water and wastewater treatment plant projects in China.

**Industrial outsourcing in Singapore**

In November 2002, Hyflux gained a construction and three year renewable operation contract for the provision of process water to ISK's Tuas titanium dioxide plant in Singapore. ISK is owned by Ishihara Sangyo Kaisha of Japan.

**Desalination contracts****Singapore**

2003	Singapore	20 year BOT	250,000 desalination
------	-----------	-------------	----------------------

In 2003, Hyflux gained a 20 year desalination BOT contract from the Singapore PUB. Construction of the Singspring facility will cost SGD250million. This contract supplies 136,380m<sup>3</sup> of water per day for the Government's Public Utilities Board since September 2005 and will run for 20 years, generating SGD30-50million pa. In June 2003, Hyflux acquired Suez's 30% stake in Singspring Pte Ltd for a "nominal consideration". The total equity investment in Singspring will be SGD50million with the other SGD200million coming from debt financing. Hyflux's share of the equity investment amounted to SGD35million with Suez's stake being sold to Singapore's Tamaesk Holdings.

**China**

2007	Tianjin	30 year BOT	300,000 desalination
------	---------	-------------	----------------------

The facility is in Bohai Bay in Dagang and will have a daily capacity of 100,000m<sup>3</sup>, expandable to 150,000m<sup>3</sup>. This will be the largest seawater desalination facility in China. In 2009, the facility entered service and it was announced that the expansion would go ahead.

**Algeria**

2008	Oran	25 year BOT	1,500,000 desalination
------	------	-------------	------------------------

Hyflux announced the financial close for the world's largest desalination project, at Oran in Western Algeria in 2009 with a capacity of 500,000m<sup>3</sup> per day. The USD468million facility is being developed by Hyflux's MenaSpring Utility Ltd and the state owned Algerian Energy Company. Construction takes place between 2009 and the first half of 2011, followed by a 25 year O&M contract which will be 47% held by MenaSpring, 43% by Algerian Energy Company And 10% by the state owned L'Algerienne Des Eaux.

**Hyflux Ltd, profit and loss account**

Y/E 31/12 (SGDmillion)	2005	2006	2007	2008	2009
Turnover	131.54	142.38	192.79	554.22	524.81
Operating profit	25.29	20.18	38.69	70.38	82.97
Net profit	49.19	15.36	36.65	62.22	74.29
Earnings per share (SGD c)	8.9	3.0	6.2	11.3	14.3

### Hyflux Water Trust

Hyflux Water Trust (HWT) was partially floated in November 2007. It is a special purpose company set up by Hyflux to manage its Chinese concession contracts. There are three water treatment works, eight wastewater treatment works and two water recycling plants in HWT's portfolio of 13 projects in 11 locations and a design capacity of 445,000m<sup>3</sup> per day. HWT may in time include concession contracts gained in other countries.

#### Chinese contracts under HWT since November 2007

2007	Changshu City	25 year BOT	Industrial wastewater
------	---------------	-------------	-----------------------

Serves an industrial park in Changshu City, Jiangsu Province with a design capacity of 30,000m<sup>3</sup>/day, which may be expanded to its concession capacity of 60,000m<sup>3</sup>/day.

2007	Tiazhou	20 year BOT	Industrial wastewater
------	---------	-------------	-----------------------

In the Gao Gand District, in Jiangsu Province with a design capacity of 20,000m<sup>3</sup>/day, which may be expanded to include a water recycling facility.

2007	Wuxi City	20 year BOT	Industrial wastewater
------	-----------	-------------	-----------------------

Serves an industrial park in Wuxi City, Jiangsu Province with a design capacity of 20,000m<sup>3</sup>/day, which may be expanded to include a water recycling facility.

2007	Tiantai	20 year BOT	100,000 wastewater
------	---------	-------------	--------------------

For municipal and industrial wastewater in Tiantai County, Zhejiang Province with a design capacity of 20,000m<sup>3</sup>/day, which may be expanded and to include water recycling.

2007	Langfang	25 year TOT	400,000 wastewater
------	----------	-------------	--------------------

Mainly for municipal wastewater in Langfang City in Hebei Province. This has a design capacity of 80,000m<sup>3</sup>/day, and may in future incorporate a water recovery unit with a capacity of 40,000m<sup>3</sup>/day.

2007	Yangkou	30 year BOT	Industrial wastewater
------	---------	-------------	-----------------------

Serves the Yangkou Chemical Industrial Park in Rudong County, Jiangsu Province with a design capacity of 20,000m<sup>3</sup>/day, which may be expanded to its concession capacity of 40,000m<sup>3</sup>/day. The facility will also provide 25,000m<sup>3</sup>/day of recycled water.

2007	Liaoyang	30 year BOT	Industrial wastewater
------	----------	-------------	-----------------------

Serves municipal users and an industrial park in Liaoyang City, Liaoning Province with a design capacity of 30,000m<sup>3</sup>/day, which may be expanded to its concession capacity of 60,000m<sup>3</sup>/day. The facility will also provide 25,000m<sup>3</sup>/day of recycled water to the local mining industry.

2007	Yangzhou	20 year BOT	Industrial water
------	----------	-------------	------------------

Serves the Yangzhou Chemical Industrial Park in Yi Cheng, Nantong, Jiangsu Province. The facility will be developed in three phases with a final capacity of 100,000m<sup>3</sup> per day and will incorporate water recovery.

2007	Defeng	30 year BOT	Industrial water
------	--------	-------------	------------------

Serves the South Port area in Defeng, Jiangsu Province with a design capacity of 20,000m<sup>3</sup>/day, which may be expanded.

2007	Zunhua	25 year BOT	100,000 water
------	--------	-------------	---------------

Serves municipal, commercial and industrial customers in the southern area of Zunhua City, Hebei Province, with a design capacity of 40,000m<sup>3</sup>/day, which may be expanded.

2007	Tianjin	30 year BOT	Industrial wastewater
------	---------	-------------	-----------------------

Serves the Jing Jin hi-tech industries belt in Beichen, Tianjin with a design capacity of 50,000m<sup>3</sup>/day (wastewater treatment) and 30,000m<sup>3</sup>/day (water recovery) each of which may be doubled.

2008	Yangkou	BOT	Industrial wastewater
------	---------	-----	-----------------------

An industrial wastewater Treatment Plant with a design capacity of 20,000m<sup>3</sup>/day, in the Yangkou Chemical Industrial Park, Rudong Coastal Economic Development Zone, Jiangsu Province. It will primarily treat wastewater from the chemical sector. It was transferred to HWT in June 2009.

2008	Wuxi	30 year BOT	50,000 wastewater
------	------	-------------	-------------------

A Wastewater Treatment Plant with a design capacity of 10,000m<sup>3</sup>/day, in Huishan District, Wuxi City, Jiangsu Province. It was transferred to HWT in June 2008.

2008	Mingguang	30 year, BOT	150,000 wastewater
------	-----------	--------------	--------------------

A contract for refurbishing and operating a Wastewater Treatment Plant with a design capacity of 30,000m<sup>3</sup>/day, in Mingguang City, Anhui Province. Investment will be CNY53million. It was transferred to HWT in June 2008.

2008	Guanyun	30 year BOT	200,000 water
------	---------	-------------	---------------

Two Water Treatment Plants with a combined design capacity of 100,000m<sup>3</sup>/day, in Guanyun County, Lianyungang City, Jiangsu Province. They were transferred to HWT in June 2008.

### Other projects in China

A further eight projects have not been transferred to HWT. The final three here were lined up for transfer in June 2008, but no subsequent announcement about their status has been made.

2008	Yangkou	30 year BOT	Industrial wastewater
------	---------	-------------	-----------------------

An industrial wastewater Treatment Plant with a design capacity of 30,000m<sup>3</sup>/day, in Yangkou Port, Yangkou Gang Economic District, Jiangsu Province. The contract will involve CNY137million in spending and entered service in 2010.

2007	Mancheng	30 year TOT	250,000 wastewater
------	----------	-------------	--------------------

Serving Mancheng County in Hebei Province, the current 30,000m<sup>3</sup> per day plant will be supported by a new 80,000m<sup>3</sup> per day plant and a 30,000m<sup>3</sup> per day water recovery facility.

2008	Xiajin	28 year BOT	200,000 water
------	--------	-------------	---------------

This will be the largest WTW in Xiajin, Shandong Province, with a capacity of 50,000m<sup>3</sup> per day which is to be expanded to 100,000m<sup>3</sup> per day at a total cost of CNY130million.

2007	Xuzhou	25 year BOTs	Water & wastewater
------	--------	--------------	--------------------

Two BOTs for the Jiawang, Xuzhou Chemical Industrial Park in Jiangsu Province, with 30,000m<sup>3</sup> per day of potable water and 25,000m<sup>3</sup> per day of wastewater treatment.

2008	Mingguang	30 year, BOT	100,000 water
------	-----------	--------------	---------------

A BOT contract for a Water Treatment Plant with a design capacity of 35,000m<sup>3</sup>/day, in Mingguang City, Anhui Province. Investment will be CNY87million, with the facility entering service in 2009.

A Wastewater Treatment Plant with a design capacity of 30,000m<sup>3</sup>/day, in Guanyun County, Lianyungang City, Jiangsu Province.

2008	Xuecheng	25 year BOT	150,000 water & wastewater
------	----------	-------------	----------------------------

Two Water Treatment Plants with a combined design capacity of 60,000m<sup>3</sup>/day, a water reuse plant with a capacity of 20,000m<sup>3</sup>/day and a wastewater treatment plant with a capacity of 40,000m<sup>3</sup>/day, in Xuecheng District, Shandong Province. The investment cost will be CNY160million.

2008	Liaoyang	30 year Own & Operate	Water
------	----------	-----------------------	-------

Water Treatment Plant with a design capacity of 40,000m<sup>3</sup>/day, in Gong Changling District, Liaoyang City, Liaoning Province.

#### Contact Details

Name: Hyflux Ltd  
 Address: Hyflux Building,  
 202 Kallang Bahru, Singapore 339339  
 Tel: +65-6214-0777  
 Fax: +65-6214-1211  
 Web: www.hyflux.com

Olivia Lum Ooi Lin (President, CEO and Managing Director)  
 Sam Ong (CFO)  
 Foo Hee Kiang (COO)  
 Gary Kee Eng-Kwee (CEO, Hyflux Water Trust)

**SOUND GLOBAL LIMITED**

Sound Global was originally called Beijing Sound Environmental Industry Group a privately owned company, founded in 1993 and had a turnover of CNY200million in 2000, employing 180 senior engineering staff. Sound Group entered the water and waste treatment sector in 1999 and had completed 600 projects in China. In September 2006, as Epure International, the company had its IPO on the Singapore stock exchange and was renamed Sound Global Ltd in 2010. The company had a second Listing (on the Hong Kong Stock Exchange) in 2010.

**Sound Global, profit and loss account**

Y/E 31/12 (CNYmillion)	2005	2006	2007	2008	2009
Construction project revenues	N/A	N/A	N/A	855.2	1,132.5
Sale of goods revenues	N/A	N/A	N/A	102.7	125.4
Design service revenues	N/A	N/A	N/A	66.9	29.9
O+M revenues	N/A	N/A	N/A	0.0	5.7
Group turnover	380.1	505.6	697.3	1,024.8	1,293.5
Operating profits	96.6	137.6	194.3	232.0	290.0
Net profits	79.9	110.6	164.4	203.7	280.5
Earnings per share (CNY)	0.09	0.11	0.13	0.16	0.22

**Sound Global and its water and wastewater services subsidiaries**

Sound Global (Singapore, holding company)

Beijing Epure International Water Co (China) (100% Sound Global)	Beijing Sound Environmental Engineering Co (China) (75% SG, 25% Beijing Epure)	Sound International Investment Holdings (British Virgin Isles) (100% Sound Global)
Hangcheng City Yiqing Water	Hainan Baichuan Water	Yantai Bihai Water
Shangluo Wastewater	Xian Qinqing Water	Jiangyuan Wastewater
Yulin City Jingzhou Water	Xian Huqing Water	Fushun Qingxi Water
Anyang Mingbo Water	N/A	Guangxi Liqing Water

Sound Group's 'China Clear Water Project' was launched in 1999 to encourage the concept of locally funded WWTW BOT contracts. In June 2001, Sound Group signed agreements to build sewage treatment plants in 11 Chinese cities. These include Golmud in Qinghai Province, Jinshan District (of the Shanghai Municipality), Jianzhou, Jianyin, Huanggang and Xiangtan in Hubei Province. The 11 sewage treatment plants will have a combined daily handling capacity of more than 1.7million tonnes. This is equivalent to serving approximately 5million people. These facilities will require a total investment of about CNY2billion (USD240million). The BOT contracts signed are to last for 25 years. The company expects the facilities to pay off the project financing after ten years. These are the first privately financed and operated sewage treatment facilities in China. Further contract awards have subsequently been gained.

**Facilities in operation or development, 2006-08:**

Henan	Huixian
Henan	Gongyi
Henan	Anyang (CNY128million, 100,000m <sup>3</sup> per day WWTW)
Henan	Luoyang Chandong District
Beijing	Xiaojahe WWTW (BOT, 2000)
Hebei	Zhengding (20,000m <sup>3</sup> per day WTW)
Shandong	Ningyang
Shandong	Jinan Changqing Economic and Technical Development Zone
Shandong	Feicheng
Shandong	Fenshang
Shandong	Linyi
Shandong	Dongping
Shandong	Xintaixinwen



Shanxi	Datong
Shanxi	Taiyuan Northern Middle of Hexi
Hubei	Jingmen Xiajiawan (BOT, 2003, 100,000 m <sup>3</sup> per day WWTW)
Hubei	Xianning (25 year WWTW BOT)
Hubei	Xianning (25 year 100,000m <sup>3</sup> per day WTW BOT)
Hubei	Xiangfan (CNY165million, 200,000m <sup>3</sup> per day WWTW)
Hubei	Zhushan (30,000m <sup>3</sup> per day WWTW)
Hubei	Danjiangkou (100,000m <sup>3</sup> per day WWTW)
Hubei	Yichang Yiling District (200,000m <sup>3</sup> per day WWTW by 2010)
Hubei	Yichang (440,000m <sup>3</sup> per day WTW)
Jiangsu	Wuxi Shuofang
Jiangsu	Wuxi Shitangwan
Jiangsu	Shuyuan (50,000m <sup>3</sup> per day WTW BOT)
Jiangxi	Nanchang Xianghu (CNY185million, 200,000m <sup>3</sup> per day WWTW)
Inner Mongolia	Xilinhaote
Inner Mongolia	Tongliao (100,000m <sup>3</sup> per day 25 year WWTW BOT)
Inner Mongolia	Wuhai
Inner Mongolia	Baotou (CNY320million, 200,000m <sup>3</sup> per day WWTW BOT, 2006)
Gansu	Baiyin
Xinjiang	Dushanzi
Guangdong	Heyuan
Yunnan	Chuxiong
Zhejiang	Huzhou (300,000m <sup>3</sup> per day WTW BOT)
Zhejiang	Hecun, Tonglu (50,000m <sup>3</sup> per day WTW)

#### Wastewater contracts gained in 2009

Contract – Operating company	Length (years)	Capacity (m <sup>3</sup> /day)
Xian - Xi'an Qinqing Water Co., Ltd	30	100,000
Xian - Xi'an Huqing Water Co., Ltd	28	30,000
Guangxi - Guangxi Liqing Water Co., Ltd	26	30,000
Hancheng City - Hancheng City Yiqing Water Co., Ltd	25	50,000
Shangluo City - Shangluo Wastewater Treatment Co., Ltd	25	30,000
Yulin City - Yulin City Jingzhou Water Co., Ltd	25	15,000
Jiangyan - Jiangyan Jiangyuan Wastewater Treatment Co., Ltd	30	80,000
Fushun - Fushun City Qinxu Wastewater Treatment Co., Ltd	30	100,000
Anyang City - Anyang Mingbo Water Co., Ltd	25	50,000

#### Wastewater contracts gained in 2010

Contract – operating company	Length (years)	Capacity (m <sup>3</sup> /day)
Yantai (JV 80% held by Sound Global)	25	50,000
Luohe, Henan	-	40,000

The Henan contract also includes a water supply plant for supplying up to 50,000m<sup>3</sup> of recycled water per day.

#### World Bank and other finance

In 2006, the World Bank's IFC decided to invest CNY80million in the company in order to support its project development and in 2009 had a 8.1% holding in the company. Sound Group believes that it is the largest Chinese private sector WWTW operator. The IFC provided a USD34million loan to the company in 2010. In addition, a USD600million credit line was secured from China Merchants Bank.

**Bundled management contract gain**

In November 2009, Sound Global won contract to manage and operate eight municipal wastewater treatment plants in Hainan Province with a total maximum treatment capacity of up to 142,000m<sup>3</sup>/day. This was the first bundled operating contract award for multiple municipal plants made to private bidders. The contract is worth approximately CNY124million, based on tonnage of wastewater treated. Hainan Baichuan Water Co Ltd will operate under a five year contract.

**International contract gain**

In August 2009, Sound Global gained its first overseas contract, an CNY620million (SAR308million) engineering, procurement and construction (EPC) project to extend and upgrade the 72,000m<sup>3</sup> per day SWTP-9 wastewater treatment plant for Marafiq, a water and utility provider in Jubail and Yanbu, Saudi Arabia. This is the first international EPC contract gained by a Chinese water/wastewater services company.

**Contact Details**

Name: Sound Global  
Address: 460 Alexandra Road, PSA Building 14-04  
Singapore, 119963  
Tel: 8610-6050-4718  
Fax: 8610-6050-4766  
Web: [www.infinitesparks.com](http://www.infinitesparks.com)

Wen Yibo (Chairman)  
Li Li (CEO)  
Choo Beng Lor (CFO)

**THAILAND****THAI TAP**

Thai Tap holds two water concessions in Thailand, Thai Tap Water (TTW), formed in 2000 and entering service in 2001 and Pathum Thani Water, a concession dating back to 1995. The contracts were originally developed between Thames Water (UK) and CH Karnchang (Thailand) until the former company pulled out of its international activities. CH Karnchang increased its stake in TTW from 29.1% to 90.2% during 2005 after buying Thames out of the joint venture. In 2006, 35% of TTW was sold to Mitsui Water Holdings (Thailand) Limited and 5% to Bangkok Expressway PCL, retaining 48% of the company. In May 2008, 25% of TTW was floated on the Bangkok stock exchange. Currently, CH Karnchang holds 35.3% of the company, Mitsui 25.9% and Bangkok Expressway PCL 9.2%.

In 2009, the company was awarded a 30 year BOT for water and wastewater services for the Bangpa-In Industrial Estate, a contract worth THB1.4billion.

Y/E 31/12 (THBmillion)	2005	2006	2007	2008	2009
Water sales – TTW	1,356	1,698	1,987	2,356	2,647
Water sales – Pathum Thani	N/A	N/A	580	1,213	1,347
Water sales – total	1,356	1,698	2,567	3,569	3,994
Group Revenues	N/A	1,722	2,623	3,639	4,067
Operating profit	N/A	1,121	1,595	2,098	2,456
Net profit	N/A	674	920	1,358	1,594
Earnings per share (THB)	N/A	0.21	0.28	0.37	0.40

Annual water sales (million m <sup>3</sup> )	Thai Tap	Pathum Thani	Total
2004	89.1	N/A	89.1
2005	100.1	N/A	100.1
2006	107.3	N/A	107.3
2007	114.6	92.8	207.4
2008	115.3	107.5	222.8
2009	117.2	108.7	225.9

1995	Northern Bangkok	25 year BOOT	800,000 water
------	------------------	--------------	---------------

The contract was awarded to Pathum Thani Water Supply Co., Ltd a joint venture between Thames Water and CH Karnchang. The contract in Pathum Thani (a northern area of Bangkok) has performed to expectations, with the THB5.0billion (USD152million), 0.288million m<sup>3</sup> per day water treatment plant entering service in October 1998. Karnchang coordinated a THB4,072million long-term debt facility with two Thai banks in 1998. The Provincial Water Authority will be responsible for collecting customer payments. The contract can be extended by up to 20 years. In 2007, CH Karnchang sold its remaining shares in Pathum Thani to TTW. TTW holds 98% of Pathum Thani's equity, with the PWA holding the other 2%.

2001	West Bangkok	30 year BOT	400,000 water
------	--------------	-------------	---------------

A THB9,639million (USD240million) contract originally signed between Thames Water and CH Karnchang of Thailand and the Provincial Water Authority (PWA) is to develop a 0.32million m<sup>3</sup> per day distribution system, which serves 400,000 people and industrial customers in Bangkok's Nakorn Pathom and Samut Sakhon districts. From 2004, the minimum take-up was 0.20million m<sup>3</sup> per day, rising to 0.30million m<sup>3</sup> per day in 2008. CH Karnchang coordinated a THB7,200million long-term debt facility with three Thai banks in 1998. In 2007, TTW provided 93million m<sup>3</sup> of water to the PWA, 12% up from 2006.

Daily demand at Patum Thani in 2009 was running at 0.34million m<sup>3</sup> per day and the company has expanded treatment capacity to 0.44million m<sup>3</sup> per day at a cost of THB1.3billion. This will meet demand to 2015, but further treatment capacity will be required with demand from the two contracts

forecast to reach 1million m<sup>3</sup> per day by 2020. A new treatment works is currently under consideration.

**Contact Details**

Name: Thai Tap Water Supply Company Limited  
Address: 30/10 Moo 12, Buddhamonthon 5 Road, Tambol Rai Khing,  
Sam Phran Distict, Nakhon Pathom Province, Thailand  
Tel: +66 2811-7528  
Fax: +66 2420-6064  
Web: [www.thaitap.com](http://www.thaitap.com)

Dr Thanong Bidya (Chairman)  
Plew Trivisvavet (Vice Chairman)  
Sompodh Sripoom (Managing Director)

**EASTERN WATER RESOURCES DEVELOPMENT & MANAGEMENT PUBLIC CO LIMITED**

The Eastern Water Resources Development and Management Public Company Limited (EASTW) was set up in 1992 as the sole supplier of water to the eastern seaboard of Thailand. The company was wholly owned by the Provincial Waterworks Authority of Thailand (PWA). In 1997, after an increase in its capital, it was partly floated on the Stock Exchange of Thailand. EASTW is developing water supply services to the provinces of Chonburi, Sakaew, Rayong, Chachoengsao, Chanthaburi and Prachinburi, all located in the most industrialised area of Thailand. Currently the water infrastructure in these provinces is unable to meet the demands of industrialisation. 40% of the company's shares are held by the PWA, 19% by Electricity Generating Plc and 5% by the Industrial Estate Authority of Thailand.

Diversification to date has been led by the Universal Utilities Company Limited (UUC), which is developing BOT and O&M contracts in other districts of Thailand. UUC has gained ten contracts to date. These involve managing the water treatment works and distribution system, reducing water losses and increasing water production capacity over the concession's life:

Chachoengsao Water Supply Company Limited (CWS, 99% held by EASTW) supplies 51,600m<sup>3</sup> of drinking water per day to 18,000 households in the Chachoengsao Waterworks Office in Chacheongsao. A 25 year agreement running from 2002.

The Bangpakong Water Supply Company Limited (BWS, 99% held) supplies 43,200m<sup>3</sup> of drinking water per day to the Bangpakong Waterworks Office in Chacheongsao under a 25 year concession from 2003.

The Nakornsawan Water Supply Company Limited (NWS, 84% held) supplies 9,600m<sup>3</sup> of drinking water per day to the Nakorn Sawan Ork Waterworks Office in Nokornsawan. A 25 year agreement running from 2003.

The 30 year O&M contract for Sattahip Waterworks was awarded to UUC by the PWA in 2000. 11,000 households are covered. It has a 31,200m<sup>3</sup> per day capacity and under the contract, UUC is to expand its capacity to 38,400m<sup>3</sup> per day and the water distribution network and has installed a THB14.5million Supervisory Control and Data Acquisition (SCADA) and Geographic Information System (GIS).

UUC has a 6 year O&M contract with Egcom Tara Co., Ltd. in 2004 to operate the Ratchaburi and Samut Songkhram Waterworks, serving the area of Muang District and Dumnern Saduak District in Ratchaburi and Muang District, Samut Songkhram for a community of over 25,000 households.

A 15 year BOT to UUC for the Si Chang island municipality's waterworks was signed in August 2000. The THB55million reverse osmosis desalination plant produces 250m<sup>3</sup> of water per day for 1,600 households since 2006.

A 15 year contract for UUC for a reverse osmosis desalination plant with a capacity of 3,000m<sup>3</sup> of water per day started in 2005 and expanded in 2007 to Koh Samui PWA.

A reverse osmosis desalination plant with a capacity of 250m<sup>3</sup> of water per day for the island municipality of Koh Lan, serving 4,000 households.

A 25 year BOT agreed in 2006 for Rayong Waterworks, supplying 44,000 households in the Muang and Baankai districts.

The Jaopraya Surasakmontree Municipality and Bo Win Sub District Administrative Organization agreed a 25 year BOT in 2004 with UUC for distributing water to 9,000 households with an initial production capacity of 2,400m<sup>3</sup> per day, rising to 2,880m<sup>3</sup> per day.

A 24,000m<sup>3</sup> per day 20 year contract for water supply to the PWA's Cholburi waterworks was signed in June 2009.

Water resources have been developed in three stages in recent years. In 2005 the production capacity rose from 171.7m<sup>3</sup> per annum to 191.3m<sup>3</sup> per annum in (Rayong River) and to 243.1m<sup>3</sup> per annum in 2007 (Bangpakong) and to 339.1m<sup>3</sup> per annum in 2008 with the opening of the Prasae and Klonyai reservoirs. Further projects are anticipated in 2013 to meet increased demand by then. Water distribution capacity has risen in three phases; from 328million m<sup>3</sup> pa to 343million m<sup>3</sup> pa in 2004, to 423million m<sup>3</sup> pa in 2005 and to 473million m<sup>3</sup> pa in 2007.

Wastewater management is at an earlier stage, with an O&M contract for the Hadyai Municipal Wastewater Treatment Plant.

#### **EASTW, profit and loss account**

<b>Y/E 30/09 (THBmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Group turnover	1,515.3	2,400.9	2,430.2	3,071.6	2,878.5
Operating profits	807.6	783.2	754.5	N/A	1,250.4
Net income	500.1	507.8	440.7	717.6	807.3
Earnings per share (THB)	0.39	0.39	0.33	0.43	0.49

<b>Million m<sup>3</sup> pa</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Raw water sales	190	199	211	279	221
Tap water sales	31	39	61	49	53

Year End was changed from 30-09 to 31-12 in 2008.  
2008 is for 15 months.

#### **Revenues by customer type (%)**

<b>Y/E 30/09</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Raw Water	65%	57%	60%	69%	66%
Service Income	5%	19%	18%	6%	10%
Tap Water	13%	15%	19%	22%	22%
Drinking Water	12%	1%	0%	0%	0%
Pipes	5%	8%	3%	6%	0%

Current tariffs are BHT6 per m<sup>3</sup> for domestic and commercial use and THB9 per m<sup>3</sup> for industrial use. In July 1999, EASTW raised THB2.5billion through a bond issue to fund expansion into non-regulated activities and to upgrade the distribution network. EASTW anticipates spending more than THB3.4billion on completing its water distribution network in Rayong, Prachinburi and Chachoengsao provinces.

In 2000, Electricity Generating Pcl (Egco) sold a 15% stake in Egcom Tara to East Water for USD2.1million. Egco is the leading Thai private sector power generation company. In July 1999, Egco acquired 70% of Egcom Tara from Require Construction Co for THB398million (USD11million). Egcom Tara has a 30 year THB690million BOT contract for water supply in Ratchaburi and Samut Songham provinces. EASTW has set up a partnership with VE and Aquathai Co of Thailand to bid for a THB800million water supply BOT for the central area of Lampang province. This consortium was the only group to pass PWA screening for the contract. East Water is currently negotiating with Egcom to acquire a majority stake in the venture. Egcom Tara also has a 10-year contract to supply tap water in Sattahip for the Provincial Waterworks Authority, a business that could generate long-term income to the company. East Water is seeking to increase its stake in Egcom Tara to 50%.

**Contact Details**

Name: Eastern Water Resources  
Development & Management Public Company Limited  
Address: 9/9 Vibhavadi Rangsit Road,  
Laksi, Bangkok, 10210 Thailand  
Tel: +66 2 940 9974-6  
Fax: +66 2 561 3793  
Web: [www.eastwater.co.th](http://www.eastwater.co.th)

Utid Tamwatin (Chairman)  
Praphant Asava-aree (President and CEO)  
Namsak Wannavisute (VP, Finance)

**UNITED STATES OF AMERICA****AECOM**

Tyco International Ltd acquired Earth Tech in 1996. Earth Tech had a turnover of approximately USD1.3billion in 2007. In 2008, Earth Tech was sold to Aecom Technology Corporation for USD510million. Aecom is involved in a number of infrastructure markets and 83% of its 2009 revenues derived from professional and technical services with 17% from management support services. It had its IPO in 2007. Tyco retained Earth Tech's water and wastewater contracts in Brazil and sold them to Grupo Aguas do Brasil (Brazil, see separate company entry). Aecom has discontinued the Earth Tech name.

**AECOM, profit and loss account**

<b>Y/E 30/09 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	2,395	3,421	4,237	5,195	6,119
Operating income	99	103	156	239	287
Net income	54	54	100	147	190
Earnings per Share (USD)	0.84	0.74	1.15	1.41	1.70

Prior to the sale, Earth Tech operated more than 200 water and wastewater treatment facilities in the United States, Canada, United Kingdom, Ireland, Hungary, China, Australia, New Zealand, Thailand, Venezuela, and Brazil. Earth Tech's water and wastewater treatment facilities served more than 10million people worldwide in 2007.

Aecom divested most of the water and wastewater operations. It sold the Mexican activities to Mitsui of Japan (see company entry) and the US water contract operations to United Water (see Suez company entry). The Chinese contracts were sold to Suez/New World in 2009 for EUR12million and the British and Irish interests are also expected to be sold at some point.

**Aecom, populations served**

<b>Country</b>	<b>Water</b>	<b>Sewerage</b>	<b>Total</b>
Australia	0	0	<b>0</b>
New Zealand	0	1,665	<b>1,665</b>
United Kingdom	700,000	63,000	<b>763,000</b>
<b>Grand Total</b>	700,000	64,665	<b>764,665</b>

**Australia**

2004	Cranbourne	25 year BOT	Wastewater
------	------------	-------------	------------

The AUD38million, 30,000m<sup>3</sup> per day facility is designed to provide recycled water for a number of horticultural and agricultural businesses in the Melbourne area.

2003	Echuca & Rochester	25 year BOT	Wastewater
------	--------------------	-------------	------------

The 25 year contract is to design, build, finance, own and operate a water reclamation project for Victoria's Coliban Water. The project will generate revenues in excess of USD80million, serving two agricultural communities in the state. It involved the development of an integrated advanced sewage treatment system for the two towns for water recovery for irrigation use on farmland. Construction of the two wastewater treatment plants will cost AUD40million and they entered service in 2004.

1998	Virginia Plains	20 year management	Wastewater
------	-----------------	--------------------	------------

The 20 year management project is for the provision of 10million m<sup>3</sup> of high grade irrigation water each year for 240 clients. This project uses 10% of Adelaide's wastewater.



**New Zealand**

2005	Mangawhai	15 year BOT	1,665 wastewater
------	-----------	-------------	------------------

Mangawhai Township is a beach resort north of Auckland. Earth Tech will operate the USD20million Mangawhai EcoCare scheme for 15 years in partnership with the Kaipara District Council.

**Venezuela**

2000	Jose	DBFO	Industrial water & wastewater
------	------	------	-------------------------------

Agua Industriales de Jose (AIJ) is a JV between Earth Tech (75%) and PDVSA, Venezuela's national petroleum company (25%). AIJ is providing water and wastewater services to 12 petrochemical consortiums at the Jose Industrial Complex. Earth Tech will initially invest USD75million in the project. AIJ owns and operates a facility which treats and supplies industrial water at a rate of 112MI/day. This facility has been upgraded to have a 260MI/day capacity.

**Hungary**

2003	MOL	15 year industrial outsourcing	Wastewater services
------	-----	--------------------------------	---------------------

The contract with MOL, the Hungarian Oil & Gas Company involves expanding, upgrading and managing the 23,850m<sup>3</sup> per day wastewater treatment facilities at the Duna refinery in Szazhalombatta, near Budapest. Total construction costs were USD45million and Earth Tech has managed the wastewater assets and services at the refinery for 15 years from June 2005. The project has been financed with the support of the EBRD.

**United Kingdom**

2005	Project Alpha	25 year PFI	850,000 water treatment
------	---------------	-------------	-------------------------

Project Alpha, one of the two PFI projects for Northern Ireland concerns the building and upgrading of four water treatment works which will serve approximately half the population of Northern Ireland. It was awarded to Dalriada Water (Earth Tech 45%, Kelda 45% & Farrans 10%) and involved GBP110million of capex between 2008 and 2009 and a treatment capacity of 0.4million m<sup>3</sup> per day.

2003	UK MoD	25 year PFI	Water & wastewater services
------	--------	-------------	-----------------------------

Bray Utilities, consisting of Kelda (45%), Earth Tech (Tyco International, 45%) and Kellogg Brown & Root (USA, 10%) gained Package A of Project Aquatrine, serving some 1,000 military sites in South West England, the Midlands and Wales. The contract is worth GBP1billion and operations commenced in December 2003.

2001	Newry	30 year BOT	63,000 sewage treatment
------	-------	-------------	-------------------------

This contract is for a 30,750m<sup>3</sup> per day PFI sewage treatment plant in Northern Ireland.

**Contact Details**

Name: Aecom  
 Address: 555 South Flower Street  
 Los Angeles, CA 90071-2300  
 Tel: 001 213 593 8000  
 Web: [www.aecom.com](http://www.aecom.com)

Richard Newman (Chairman)  
 John M Dionisio (President and CEO)

## ALLIANCE WATER RESOURCES

Alliance Water Resources (AWR) is a privately held company (SCW) operating in Midwestern USA and employing 250 staff. The company was founded in 1976, and over the past 30 years, has operated in excess of 100 water and wastewater treatment facilities. It is the leading water services outsourcing company in Missouri. Currently, it serves 342,821 people through a series of O&M contracts in the states of Missouri and Iowa, up from 272,800 people in 2003.

### Activities by client category

Commercial & industrial	10%
District	30%
Municipal	60%

Contract services provided include water treatment (55% of clients), water distribution (68%), wastewater treatment and sewerage (82%), water & wastewater (55%), meter reading (55%) and complete services management (32%).

Bowling Green, MO	Water & wastewater (municipal, 1994-)	5,166
Cameron, MO	Wastewater (municipal, 1990-)	11,500
Cape Girardeau, MO	Water (municipal, 1992-)	37,500
Elsberry, MO	Water & wastewater (municipal, 2000-)	2,000
Fulton, MO	Water & wastewater (municipal, 1992-)	12,100
Lake Ozak, MO	Wastewater (municipal, 1999-)	10,000
Lexington, MO	Wastewater (municipal, 1993-)	5,000
O'Fallon, MO	Water & wastewater (municipal, 1993-)	60,000
Maquoketa, Iowa	Water & wastewater (municipal, 2001-)	6,100
Tipton, Iowa	Water & wastewater (municipal, 1999-)	3,155
Parkville, MO	Wastewater (municipal, 2002-)	4,000
Buchanan Co, MO	Water (district, 2001-)	2,500
Franklin Co, MO	Water & wastewater (district, 1994- & 2005-)	10,000
Henry Co, MO	Water (district, 1983- & 2002-)	13,000
Lincoln Co. MO	Water & wastewater (district, 1995-)	12,000
Platte Co. MO	Water (district, 2002-)	4,000
Ralls Co. MO	Water & wastewater (district, 2001-)	6,300
St Charles' Co, MO	Water & wastewater (district, 1980- & 1986-)	122,000
Troy, MO	Wastewater (municipal, 2005-)	8,900
Bonne Terre, MO	Wastewater (municipal, 2005-)	6,400
Phelps Co, MO	Wastewater ( district, 2006-)	1,200

### Contact Details

Name: Alliance Water Resources  
 Address: 206 South Keene Street  
 Columbia, MO 65201  
 Tel: +1 573 874-8080  
 Fax: +1 573 443-0833  
 Web: [www.alliancewater.com](http://www.alliancewater.com)

Gary Anger (President and CEO)

## AMERICAN WATER WORKS

AWW has a considerable historic presence; one of its main subsidiaries, E'town Water dates back to 1854 and the American Water Works & Guarantee Company was founded in 1886. American Water Works (AWW) has been seeking to create a national presence in the USA water market through a long-term acquisition programme that started in earnest during 1996. AWW seeks to concentrate on developing regional strength in water utility operation rather than merely further the numbers served. Thus in August 2001 AWW sold certain activities in New England to Kelda Group as Kelda's Aquarion had a stronger presence in this region.

In September 2001, American Water Works agreed to a USD4.6billion bid by RWE after rejecting a USD3.5billion bid in August 2001. AWW was merged with Thames Water in 2003 and renamed American Water. In addition, E'town Water, which was acquired by Thames in November 1999 after an agreed USD948million bid has been integrated within AWW. The AWW transaction was subject to the approval of utility regulatory commissions which was completed in January 2003. In 2006, it was announced that AWW would be spun off from RWE via an IPO during 2007. As part of this process, American Water was renamed American Water Works and RWE sold 36% of AWW's equity on the NYSE in April 2008. The divestment process was completed by November 2009.

### AWW, profit and loss account

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Regulated business	1,836.1	1,854.6	1,987.6	2,082.7	2,150.3
Non-regulated business	300.6	238.5	242.7	272.2	257.7
Group turnover	2,136.7	2,093.1	2,214.2	2,336.9	2,440.7
Operating income	111.6	252.5	15.1	-186.9	173.6
Interest paid	335.7	361.5	270.6	285.2	296.5
Net income	-275.1	-155.9	-342.3	-562.4	-233.1
Earnings per share (USD)	-2.03	-1.01	-2.14	-3.52	-1.39

### AWW, breakdown of revenues and volumes (USDmillion)

Y/E 31/12 2009	Revenues	Water volumes
Residential	1,263.2	53.4%
Commercial	425.7	22.4%
Industrial	99.7	9.5%
Public & other	272.0	14.7%
Total Water	2,060.6	100.0%
Wastewater	89.7	N/A

AWW has 72 regulated and non-regulated subsidiaries in the USA and Canada and provides wastewater services in 11 states. The 3.3million regulated customers account for 89.6% of operating revenues.

Capital spending was USD1,000million in 2008 and USD785million in 2009, with USD800-1,000million forecast for 2010. Replacement of the extant network accounts for 40% of capital spending, 20% for new assets to meet customer growth, 15% for new standards and efficiency and service enhancements accounting for 25%.

### Major acquisitions, 1996-2007

Year	Company	People served	Cost (USDmillion)	Turnover USDmillion
1996	PAWC	2,000,000	409	N/A
1998	EHCS	35,000	17	N/A
1999	NEI	1,700,000	700	N/A
1999	American Anglian (50%)	1,000,000	32	31 (1999)
2000	UWR subsidiaries	122,500	50	N/A
2001	City of Coatesville	53,000	48	7 (2001)

Year	Company	People served	Cost (USDmillion)	Turnover USDmillion
2001	Azurix North America	2,000,000	160	134 (2001)
2002	Citizens Utilities subsidiaries	1,100,000	859	140 (2001)
2007	South Jersey Water Supply Co	25,000	14	N/A

In December 2007, the company announced that it was seeking to acquire the assets of the city of Trenton's water system located in Ewing, Hamilton, Hopewell and Lawrence townships. The proposed purchase price is USD75million. This would add 40,000 new customers. The acquisition has been delayed by legal issues.

#### AWW, regulated activities in 2009

State	Customers	People (million)	Revenues
Pennsylvania	652,227	2.2	459.8
New Jersey	644,273	2.5	560.3
Missouri	457,496	1.5	203.8
Indiana	283,088	1.2	157.4
Illinois	308,476	1.2	197.4
California	171,854	0.6	142.7
West Virginia	172,006	0.6	120.2
Others	641,459	2.2	365.7
<b>Total</b>	<b>3,330,929</b>	<b>12.0</b>	<b>2,207.3</b>

There are 9.8million people served in the leading seven states and an estimated 2.4million people served in the 12 other states, or a total of 12.2million people. A further 4.2million are served by non regulated activities in the USA and 0.4million in Canada.

Customers, 2009	Water	Wastewater
Residential	2,889,315	149,969
Commercial	226,581	6,552
Industrial	4,375	13
Private fire	37,911	4
Public authority & other	16,008	201
<b>Total</b>	<b>3,174,190</b>	<b>156,739</b>

#### AWW, tuck-in acquisitions, 1998-2009

Year	Transactions completed	Customers served	Customers per deal	Total cost (USDmillion)	USDper customer
1996	13	N/A	N/A	36.9	N/A
1997	9	N/A	N/A	2.9	N/A
1998	22	26,770	1,785	47.2	1,756
1999	21	14,000	666	12.4	857
2000	12	38,000	3,167	52.1	1,368
2001	10	20,000	2,500	56.3	2,795
2002	9	29,000	3,625	31.9	1,100
2003	10	N/A	N/A	4.6	N/A
2004	8	N/A	N/A	1.9	N/A
2005	7	N/A	N/A	5.0	N/A
2006	11	N/A	N/A	12.5	N/A
2007	8	N/A	N/A	18.0	N/A
2008	10	N/A	N/A	12.5	N/A
2009	6	N/A	N/A	7.8	N/A

After being bought by RWE, acquisitions were effectively wound down and have been revived as the company prepared for its partial divestment since 2006.

### Non-regulated activities: American Water Services

In 2009, AWW had 52 major outsourcing contracts, 44 O&M and 8 DBOs. The O&M contracts have contract revenues of USD3,402million outstanding. A new entity, Contract Operations Group started operations in 2010, combining the Applied Water Management Group's 196 contracts (USD19.5million revenues in 2009) and EMC, which has 26 municipal and 28 industrial customers.

Anglian Water Group (AWG) of the UK formed American Anglian Environmental Technologies (AAET) in 1993, a 50:50 JV with AWW to pursue opportunities for water and sewerage projects. AWG sold its stake in the JV to AWW in October 1999 for USD32million. AAET serves 1.0million people through managing 175 water and wastewater treatment facilities in seven states, with a 1999 turnover of USD31million.

In August 2001, AWW acquired all of the North American activities of Azurix from Enron for USD153.3million plus USD6.5million in debt. Azurix has built a broad portfolio of activities in the USA and Canada, including a small utility, and municipal and industrial outsourcing services, water rights and a web based water trading system. The latter, water2water.com is now a web site selling fish tanks. Azurix acquired Philip Utilities Management Corporation for USD106million in May 1999. Azurix North America (ANA) had a turnover of USD131.5million in 2001, serving approximately 2million people, including 1.82million for water provision and 0.35million for sewerage and wastewater treatment services (estimated).

### Azurix contract gains in the USA (USDmillion)

Date	Contract	Location	Value	Duration (Years)	Annual revenues
05-2000	O&M water provision	Jefferson, Louisiana	30	15	2.0
05-2000	O&M water provision	Brunswick, New Jersey	120	20	6.0
05-2000	O&M water provision	Wildwood, New Jersey	71	20	3.6
11-1999	O&M water & wastewater	Gary, Indiana	10	5	2.0

AWW's Military Services Group made two major contract gains in September 2008: a contract for ownership, operation and maintenance of the water and the wastewater systems at Fort Polk Army Installation, Louisiana worth USD348million over a 50-year period and a contract for ownership, operation and maintenance of the water distribution system and wastewater collection system at Fort Hood Army Installation, Texas worth USD329million over a 50-year period.

One other major contract gain was the 1996 USD410million contract for Pennsylvania Enterprises' water systems near Scranton, Pennsylvania. AAET also manages the operation of 2 New Jersey systems and 15 in Indiana, most of which are for small communities.

### Environmental Management Corp (EMC)

Environmental Management Corp, which had revenues of some USD40million in 2001, manages water and wastewater treatment facilities for both industrial and local municipal customers around the US. EMC serves municipal clients with populations ranging from 5,000 to around 200,000. Turnover was marginally up during 2004, with the company operating at break-even. Major contract gains have been made in the animal food sector in the USA. In October 2002, BOC Group acquired Environmental Management Corp, a privately held St. Louis-based water services company, for USD50million. In September 2006, Linde acquired BOC for EUR15billion and EMC was sold to AWW in 2009 for USD18.1million.

### EMC, main water and wastewater treatment O&M contracts

Brighton, Il	0.55 MGD wastewater treatment plant
Lichfield, Il	1.72 MGD wastewater treatment plant
Godfrey, Il	2.2 MGD wastewater Plant
Monmouth, Il	4.2 MGD wastewater plant
Mount Vernon, Il	5.0 MGD wastewater plant
Oregon, Il	0.625 MGD wastewater plant

Pittsfield, IL	1.5 MGD wastewater plant
Evansville, IL	East – 18.0 MGD wastewater plant
Evansville, IL	West – 20.6 MGD wastewater plant
Jeffersonville, IL	5.2 MGD wastewater plant
Sellersburg, IN	1.5 MGD wastewater plant
Sellersburg, IN	2.5 MGD water treatment plant
St Charles, MO	Missouri – 5.0 MGD wastewater plant
St Charles, MO	Mississippi – 5.5 MGD wastewater plant (being expanded to 7.9 MGD)
Seymour, IN	4.3 MGD wastewater plant
Vincennes, IN	4.56 MGD wastewater plant

### Canada

American Water Services provide O&M outsourcing services in Ontario. In September 2001 Azurix NA was awarded a 10 year contract to operate and maintain the Lake Huron and Elgin Area Primary Water Supply Systems in Ontario. ANA bid was priced at CAD71.2million (USD47.5million) over the length of the contract, a saving of approximately CAD1million pa. The contract has an option for an additional five years and serves a population of approximately 420,000.

### Contact Details

Name: American Water Works  
Address: 1025 Laurel Oak Road, Voorhees, NJ 08043, USA  
Tel: (609) 346-8200  
Fax: (609) 346-8360  
Web: [www.amwater.com](http://www.amwater.com)

George MacKenzie (Chairman)  
Donald L. Correll (President and CEO)  
John S. Young (Chief Operating Officer)  
Walter Lynch (CFO)

**AMERICAN STATES WATER**

American States Water (AWR) owns the Golden State Water Company (SCW), which was founded in 1929 and floated in 1931. It is a utility company engaged principally in the purchase, production, distribution and sale of water. SCW operates in three regions, serving 75 communities in 10 counties in the state of California and provides water services in 21 customer service areas. Approximately 73% of SCW's water customers are located in the greater metropolitan areas of Los Angeles and Orange County. SCW also provides electricity services to the City of Big Bear Lake and surrounding areas in San Bernardino County. Combined revenues derived from commercial and residential water customers accounted for approximately 86% and 93% of total water revenues in 2007 and 1997, respectively. SCW served 254,546 water customers (1 in 30 Californians) at the end of 2007. 52% of water requirements are met from company owned resources and the company's immediate priority is to secure its longer term supplies in compliance with Californian legislation which calls for a minimum of 20 years of guaranteed water supplies for all new developments in the state.

AWR is expanding through a series of local acquisitions in California and other states. In December 1999, AWR sought to acquire Peerless Water, a company serving 1,900 customers in Bellflower, California. Regulatory clearance was anticipated by the end of 2001. In October 2000, AWR acquired Chaparral City Water Company (CCWC) from MAXXAM Inc. for USD31.2million, less outstanding debt. CCWC provides water to 13,400 customers in the towns of Scottsdale and Fountain City in Arizona.

**AWR, profit and loss account**

Y/E 31/12 (USDmillion)		2004	2005	2007	2008	2009
Water customers:	SCW	251,381	252,845	254,546	254,482	254,998
	CCWC	12,750	13,001	13,448	13,423	13,406
Turnover:	SCW	194.4	198.5	230.2	240.5	265.2
	CCWC	6.5	7.0	7.7	7.5	7.7
	ASUS	1.8	3.5	34.9	42.4	59.1
Operating profits:	SCW	52.5	54.9	61.4	61.6	64.0
	CCWC	1.3	2.1	1.2	-7.0	-0.3
	ASUS	-4.9	-2.7	2.0	-1.0	6.4

Y/E 31/12 (USDmillion)	2005	2006	2007
Residential & commercial	185.4	198.3	213.6
Industrial	2.7	2.6	2.5
Fire service	1.5	1.5	1.6
Other water	16.1	20.4	20.2
Contracted service revenue	5.2	16.5	34.9
<b>Customers</b>			
Residential & commercial	258,428	259,708	260,193
Industrial	372	371	377
Fire service	3,596	3,681	3,797
Other	3,450	3,553	3,667

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Water	205.5	222.91	237.88	247.94	272.92
Electricity	27.2	29.27	28.57	28.42	28.92
Contracted services	1.80	3.50	34.91	42.36	59.13
Group turnover	236.2	268.63	301.37	318.72	360.97
Operating income	40.4	56.61	67.73	54.81	69.49
Interest paid	-13.6	-18.30	-19.21	-21.33	-22.31
Net income	26.8	23.08	28.03	22.01	29.53
Earnings per share (USD)	1.57	1.33	1.61	1.27	1.63
Dividends per share (USD)	0.90	0.91	0.96	1.00	1.01

The company's American States Utility Services (ASUS) was founded in 1998 and provides outsourcing, billing and meter reading services to a further 97,000 non-regulated customers in

California and Arizona. This includes 33,000 customers in the city of Torrance, CA whose services were outsourced to ASUS in 2000. ASUS is also entering the water rights market having acquired 5,000 acre-feet of perpetual rights in the Sacramento River in 2006.

In October 2004 ASUS started an own, operate and maintain contract for the water and wastewater systems at Ft. Bliss, located near the City of El Paso, Texas, through a wholly-owned subsidiary, Fort Bliss Water Services Company. Revenues for the contract are estimated at more than USD196million over its 50-year period and are subject to periodic price re-determination adjustments and adjustments for changes in circumstances. A similar 50 year O&M contract for water & wastewater services for the Andrews Air Force Base in Maryland, and Fort Story, Fort Eustis and Fort Monroe and the wastewater system at Fort Lee in Virginia started in February 2006, which will generate USD238million in revenues. These services are provided by the company's Terrapin Utility Services Inc and Old Dominion Utility Services Inc. Contracts for water and wastewater services for Fort Jackson (South Carolina) and Fort Bragg, Pope Air Force Base and Camp MacKall (North Carolina) were gained in 2008.

**Contact Details**

Name: American States Water Company  
Address: 630 East Foothill Boulevard,  
San Dimas, CA 91773, USA  
Tel: (909) 394-3600  
Fax: (909) 394-0711  
Web: [www.aswater.com](http://www.aswater.com)

Lloyd E. Ross (Chairman)  
Robert J Sprowls (President/CEO)  
Eva G Tang (Senior Vice President/CFO)  
McClellan "Bud" Harris III (Senior Vice President, AS Utility Services)



**AQUA AMERICA INC**

Philadelphia Suburban Corporation was incorporated in 1968 and is the second largest investor-owned water utility in the USA, with 951,000 customers and serving over 3.0million people. It changed its name to Aqua America (AA) in January 2004. AA owns the Philadelphia Suburban Water Company (PSW) and the Consumers Water Company (CWC). PSW supplies water to approximately 426,000 residential, commercial, industrial and public customers in a service territory of 481 square miles in the suburban area west and north of the City of Philadelphia, serving 1.3million people excluding 6,000 customers served by an O&M contract. The company has subsequently expanded into 13 other states, which now account for 48% of revenues.

**AA, development of regulated customer base**

Year	Customers
1992	244,788
1996	284,141
1999	548,937
2003	749,491
2006	926,823
2007	949,378
2009	945,540
2008	953,437

**Tuck-in acquisitions (USDmillion)**

Year	Number	Consideration	Turnover added	Customers
1997	4	1.23	0.36	1,700
1998	5	25.38	4.69	9,007
1999	16	39.16	4.90	17,250
2000	18	11.84	2.63	14,418
2001	20	14.88	4.74	25,550
2002	25	11.66	2.92	9,175
2003	17	1.61	0.98	N/A
2004	27	3.84	1.23	N/A
2005	30	12.31	6.97	N/A
2006	27	11.85	9.63	N/A
2007	26	24.56	4.43 [1]	23,909
2008	9	14.66	N/A	9,941
2009	18	3.37	N/A	4,484

[1] Turnover added during the year

USD270million has been spent on acquisitions between 1999 and 2003 and USD356million in cash and shares between 2003 and 2009. Since the start of 1995, PSW has acquired 200 local water systems and three wastewater utilities in areas adjacent to its current operations. These have added in excess of 120,000 customers to AA's original activities. In March 1999, PSC acquired the CWC for 13.01million shares, valuing the company at USD463million. CWC serves approximately 232,000 customers (700,000 people) in service territories covering parts of Pennsylvania, Ohio, Illinois, New Jersey and Maine.

Acquisitions noted in 2008 include Honesdale Consolidated Water Company (HCWC) which serves approximately 6,000 people in Honesdale Borough and Texas Township, Wayne County (USD6.7million in September), South Haven Sewer Works, Inc., a wastewater company (USD9.7million in August), which serves 4,000 customers in South Haven in Porter County in northwest Indiana and a wastewater and local irrigation system (USD1.6million in May) serving 3,000 residents in the Fountain Lakes development in Estero, Lee County, Florida.

Capital spending for 2011-2014 is expected to be at USD315million pa compared with USD275million pa for 2007-11 and USD201million pa for 2002-2006 and USD101million pa for 1997-2001.

### Agreed bids for AquaSource, Florida Water, Heater Utilities and New York Water Service

In July 2002, AA launched an agreed bid with DQE to purchase AquaSource. The USD190.7million bid was completed in July. AquaSource has approximately 130,000 customers in 600 operating systems along with 40,000 O&M customers. Most of these customers are in Texas, Florida (21,000 customers), Virginia, Indiana, North Carolina, New Jersey and Missouri with a smaller number of customers in five other states. After arbitration, in 2004, the bid price was revised to USD178.4million.

In June 2004 AA acquired Allete's North Carolina-based water and wastewater systems, Heater Utilities, Inc., for USD48million in cash and USD28million in debt. Heater Utilities was formed in 1964 and had revenues of USD19.5million in 2003. Heater Utilities serves 50,000 customers, 45,000 for water and 5,000 for wastewater services through 245 water and 15 wastewater systems. In July 2004, AA completed the acquisition of 63 water and wastewater systems from Allete's Florida Water Services Corporation for a total of USD14.7million.

In January 2007 AA acquired New York Water Service Corporation for USD26.6million and USD23.0million in debt. New York Water Service Corporation provides water service to 44,792 customers in several water systems located in Nassau County, Long Island, New York.

The agreed bid for Pennichuck in May 2002 was terminated in February 2003 when a referendum in Nashua, New Hampshire sought to authorise the municipal acquisition of Pennichuck.

### AA, geographical split of turnover

YE 31/12	Revenues (USDmillion)	Total customers	Water customers	Wastewater customers	People served
Pennsylvania	279.7	438,000	420,000	13,500	1,400,000
Ohio	39.9	86,000	86,000	0	255,000
Illinois	35.3	70,000	56,000	6,000	N/A
Texas	38.0	61,400	48,000	13,000	155,000
New Jersey	22.6	54,400	49,700	4,700	165,000
Virginia	8.3	26,000	21,000	6,000	81,000
Florida	15.3	38,700	23,000	14,000	117,000
Indiana	16.9	35,000	13,000	22,000	N/A
Maine	9.4	16,000	16,000	0	48,000
Missouri	N/A	3,750	1,600	2,100	10,000
New York	N/A	50,300	50,300	0	152,000
North Carolina	29.8	86,200	71,000	13,000	250,000
South Carolina	N/A	400	0	400	-N/A

Revenues are for 2005 and customers are for 2007, updated where possible from the 2009 analyst's presentation and the company website. Activities have subsequently been added in Georgia.

### AA, profit and loss account

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Residential	295.47	317.77	360.54	374.57	392.05
Commercial	73.46	76.08	85.55	90.06	94.15
Industrial	18.36	18.75	19.55	19.87	19.44
Other water	50.83	51.26	58.27	58.50	70.37
Wastewater	42.18	48.91	52.89	58.87	70.23
Other revenues	13.16	13.53	12.94	13.28	12.67
Group turnover	496.80	533.49	602.50	626.97	670.54
Net income	91.16	92.00	95.01	97.92	104.35
Earnings per share (USD)	0.71	0.70	0.71	0.73	0.77

**AA customers (net of dispositions)**

<b>Metered customers</b>					
Residential	724,954	780,828	796,591	791,929	796,926
Commercial	33,975	36,280	37,330	38,334	38,871
Industrial	1,356	1,337	1,317	1,299	1,270
Other	15,584	15,587	16,509	16,466	17,191
Wastewater	89,025	92,791	97,631	97,512	99,269
<b>Total – regulated</b>	<b>864,894</b>	<b>926,823</b>	<b>949,378</b>	<b>945,540</b>	<b>953,437</b>

**Condemnations and dispositions**

In December 2002, as a result of the settlement of a condemnation action, the Ohio operations were sold to Ashtabula County for USD12.2million, with a net after-tax gain of USD3.7million. Other sales have been for peripheral operations in Kentucky and Connecticut (some Aquasource activities) while the Fort Wayne (Aquasource) activities covering 10,921 customers were sold to the municipality for USD16.9million under eminent domain in February 2008. In August 2008, a water and wastewater system serving 11,598 customers in Illinois was sold. Other sales were in Texas (561 customers in June 2009) and Virginia (1,304 customers in December 2007).

The cumulative annual impact of utility system dispositions between 2005 and 2009 was: 24,189 for 2005, 24,410 for 2006, 23,517 for 2007 and 561 for 2008.

**Contact Details**

Name: Aqua America Inc  
Address: 762 Lancaster Avenue,  
Bryn Mawr, PA 19010, USA  
Tel: +1 610 525 1400  
Fax: +1 610 645 1061  
Web: [www.aquaamerica.com](http://www.aquaamerica.com)

Nicholas DeBenedictis (Chairman/President/CEO)  
David P. Smeltzer (Senior Vice President - Finance/CFO)  
Christopher H. Franklin (Regional President, AA Southern Operations)  
Karl M. Kyriss (Regional President, AA Mid-Atlantic Operations)  
Robert G. Liptak (Regional President, AA Northern Operations)

## ARTESIAN RESOURCES CORPORATION

Artesian Resources Corporation (ARC) is the parent holding company of Artesian Water Company, Inc. (AWC). AWC was founded in 1927 as the successor to the Richardson Park Water Company, founded in 1905. In 1984, the company was renamed Artesian Resources Corporation and the utility assets were vested to a newly formed subsidiary, Artesian Water. In 2009, Artesian had 76,900 metered water customers (68,049 in 2002) and 729 metered wastewater customers (none before 2005) and served a population of approximately 276,000, representing approximately 31% of Delaware's total population, (a 39% increase since 1991). Artesian also has 38 customers in Pennsylvania, which will be augmented by four developments serving 350 customers.

Since 1993, Artesian has added to its service territory by acquiring exclusive service areas in Delaware. This expansion, which has occurred in southern New Castle, Kent and Sussex Counties, has increased the exclusive service area in Delaware by approximately 40% since 1993. In 1998, ARC acquired the rights to provide water to two municipalities and neighbouring developments in Sussex County serving some 10,000 new customers from 2005. This area has accounted for 38% of ARC's customer growth since 1998. Facilities serving 4,400 customers in these areas are currently being developed. Artesian also entered into agreements in 1998 to supply water to two municipalities in New Castle County. In 2003, residents in Broad Run Ridge, Pennsylvania were connected to the Delaware system. The company has also identified a number of wastewater treatment opportunities.

### Artesian Water, revenue by customer class

Revenue by customer class	2005	2006	2007	2008	2009
Residential	57.1%	55.8%	57.6%	55.3%	54.2%
Commercial	22.6%	22.2%	22.3%	21.4%	21.3%
Industrial	0.6%	0.8%	0.7%	0.5%	0.3%
Government and other	11.7%	12.3%	11.7%	12.0%	12.7%
Other water revenues	2.4%	2.6%	3.2%	3.6%	3.6%
Non-utility operating revenues	5.7%	3.6%	4.5%	7.2%	7.9%
Number of customers	72,383	73,800	75,514	75,900	76,900

Artesian Water Maryland and Artesian Wastewater Maryland were established in 2007 to provide regulated water and wastewater services in the state. 141 water customers in Cecil County were added in August 2007. Artesian Wastewater (AW) was created in 1996 as a non-regulated subsidiary to provide wastewater treatment services in Delaware. Services started in 2005 and the company had 729 customers in six communities in the state in 2009. Artesian Utility specialises in non-regulated operates two wastewater treatment plants serving 10,000 customers in Middletown entered service in 2002. These contracts have a 20 year term, which can be extended by an additional 20 years.

### ARC, profit and loss account

Y/E 31/12 (USDmillion)	2005	2007	2007	2008	2009
Turnover	45.29	48.59	52.22	56.19	60.91
Operating income	10.64	11.80	11.77	11.91	13.64
Net income	5.04	6.07	6.26	6.42	7.26
Earnings per share (USD)	0.81	0.97	0.90	0.86	0.97
Dividends per share (USD)	0.58	0.61	0.66	0.71	0.72

### Contact Details

Name: Artesian Resources Corporation  
Address: 664 Churchman's Road, Newark, DE 19702  
Tel: (302) 453-6900  
Fax: (302) 453-5800  
Web: [www.artesianwater.com](http://www.artesianwater.com)

Dian C. Taylor (Chairman/President/CEO)  
David B. Spacht (Vice President/CFO/Treasurer)

**CADIZ INC**

Cadiz Inc (Cadiz) is involved in the development of water and agricultural resources, as well as selected water-related technologies. Cadiz has created a portfolio of assets encompassing undeveloped land with groundwater resources in central and southern California with secure and reliable water rights that are situated near to the state's aqueduct system. In 1996, Cadiz acquired Sun World International Inc (Sun World), one of the largest agricultural companies in California. The company holds 34,500 acres in the Cadiz Program area along with 9,000 acres in Piute Valley and 1,800 acres in Danby Dry Lake. The latter two are supplementary to its main programme.

In 1997, Cadiz entered into an interim agreement with the Metropolitan Water District (MWD) of southern California to develop a 50 year agreement for the Cadiz Groundwater Storage and Dry-Year Supply Program. The Program will enhance southern California's water supply reliability by providing a new dry-year water supply and new storage capacity. The infrastructure for the water transfer will cost USD150million (over the contract period) and will allow the district to store up to 500,000 acre-feet of water in wet years and to transfer up to 1.1million acre feet from Cadiz's holdings during dry years. The first 400,000 acre-feet will be purchased by the MWD for USD92million. The total value of the contract has been estimated at USD1billion. An agreement drawn up in 1993 with the San Bernardino County Board of Supervisors allows for the withdrawal of more than 1million acre-feet of groundwater from the Company's underground water basin. In August 2002, the US Department of the Interior supported the proposals, but in October 2002, the MWD's final vote rejected the water-storage project and no subsequent progress has been made. Claims against the MWD for compensatory and punitive damages were filed in November 2005 and were finally settled in February 2009. In August 2008, the MWD announced that mandatory water rationing would be considered from 2009 in the wake of continuing shortages and reduced allocations.

In September 2008 Cadiz announced a 99 year lease with the Arizona and California Railroad Company for conveying water to the Colorado River Aqueduct. Although more expensive, this will obviate the environmental concerns arising from the original conveyancing project. Letters of Intent were signed with five Californian water providers serving three million customers in June 2009. Surveys carried out in 2009 conclude that the aquifer has suitable resources for the scheme.

**Cadiz Inc., profit and loss account**

<b>Y/E 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Total turnover	1.20	0.61	0.43	0.99	0.81
Net income	-23.03	-13.83	-13.63	-15.91	-14.40
Earnings per share (USD)	-2.14	-1.21	-1.15	-1.32	-1.13

**Contact Details**

Name: Cadiz Inc  
Address: 550 South Hope Street, Suite 2850,  
Los Angeles, CA 90071 USA  
Tel: +1 213 271 1600  
Fax: +1 213 271 1614  
Web: [www.cadizinc.com](http://www.cadizinc.com)

Richard Stoddard (CEO)  
Mark A Liggett (Senior Vice President)

**CALIFORNIA WATER SERVICE CO.**

The California Water Service Company (CWSC) was formed in 1926, and was transformed into a holding company in 1997. The company is the largest investor-owned water company in California and the fourth largest in the USA, serving 2.0million people with water and wastewater and providing water meter reading for a further 175,000. Since 2000, customer gains have been running at 5,000-7,500 per annum. CWSC provides water and wastewater services to 487,600 residential, commercial and industrial customers in regulated contracts in California, New Mexico, Washington and Hawaii and 107,700 customers through unregulated water activities. Regulated customers generated revenues of USD753 each in 2007 against USD692 in 2006. These regulated contracts are mainly in the San Francisco Bay, Sacramento Valley, Salinas Valley, San Joaquin Valley and Los Angeles. Due to the shortage of water in its operating area, 51% of water supplied by the company was purchased from third parties in 2007.

There were 426,600 metered customers and 68,100 flat rate customers in 2009, compared with 402,191 metered customers and 76,810 flat rate customers in 2005.

**Customer base, 2009**

[Non-regulated customers are for 2005]

	California	New Mexico	Washington	Hawaii	Total
Regulated	467,100	7,800	15,600	4,200	<b>494,700</b>
Regulated – sewerage	0	1,700	0	0	<b>1,700</b>
O&M	35,300	0	3,900	0	<b>39,200</b>
15 year lease	6,100	0	0	0	<b>6,100</b>
Meter reading	13,400	49,000	0	0	<b>62,400</b>
<b>Total</b>	<b>511,500</b>	<b>57,180</b>	<b>19,211</b>	<b>3,770</b>	<b>600,070</b>

Rio Grande Utilities Corporation (Rio Grande) was acquired in 2001 (approval gained in 2002) for USD2.3million, with USD3.1million in assumed debt. Rio Grande has annual revenues of USD1.2million. In May 2000, CWSC merged with Dominguez Services Corporation (DSC), a water provision company serving 150,000 people in the Los Angeles area. DSC's main holding is the Dominguez Water Company (32,637 customers, 120,000 people in 18 communities in the Carson/Torrance area of Los Angeles County), along with 3 smaller subsidiaries; the Kern River Valley Water Company (1,271 customers), the Antelope Valley Water Company (4,096 customers) and Redwood Valley Water Company (1,912 customers). In addition, DSC Investments generates revenues from the transfer of water rights between third parties. DSC had revenues of USD28.5million in 1999. In May 2003, CWSC acquired Kaanapali Water Corporation, now renamed Hawaii Water, which provides water service to 1,500 customers on the island of Maui, including several large resorts and condominium complexes, 500 customers from the original acquisition and approximately 1,000 from acquisitions and developments on Maui and Big Island.

Non regulated revenues were USD13.56million in 2007, with operating profits of USD4.44million. Non-regulated revenues were USD9.26million in 2005, with operating profits of USD2.98million.

**California Water Service Co., profit and loss account**

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Residential	222.63	232.81	253.75	284.91	315.62
Business	56.96	60.37	65.46	75.62	86.77
Industrial	14.24	16.29	17.40	18.93	18.96
Public authorities	14.97	15.73	17.95	21.04	22.41
Other customers	11.93	9.53	12.53	9.81	5.62
Group turnover	320.73	334.72	367.08	410.31	449.37
Net income	27.22	25.58	31.16	39.81	40.55
Earnings per share (USD)	1.47	1.34	1.50	1.90	1.95
Dividend per share (USD)	1.14	1.15	1.16	1.17	1.18

In September 2008, Hawaii Water acquired Waikoloa Resort Utilities, Inc., Waikoloa Water Company, Inc., and Waikoloa Sanitary Sewer Company, Inc. (West Hawaii Utilities). West Hawaii Utilities serves 1,970 customers in homes, condominiums, hotels, golf courses, and shops at Waikoloa Beach Resort and in Waikoloa Village in Big Island.

**Contact Details**

Name: California Water Service Group  
Address: 1720 North First Street,  
San Jose, CA 95112 USA  
Tel: +1 408 367 8200  
Fax: +1 831 427 9185  
Web: [www.calwater.com](http://www.calwater.com)  
Web: [www.dominguezh2o.com](http://www.dominguezh2o.com) / [www.calwatergroup.com](http://www.calwatergroup.com)

Robert W. Foy (Chairman)  
Peter C. Nelson (President/CEO)  
Martin A. Kropelnicki (CFO)

**CH2M HILL**

CH2M Hill is an employee-owned civil engineering company. It was founded in 1946 by Messrs Cornell, Howland, Hayes & Merryfield who in turn merged with Claire A Hill Associates in 1971. The company employs 23,500 staff. In Puerto Rico, CH2M Hill was involved in the design and upgrading or construction of 600 water and wastewater facilities as part of a USD2.1billion investment completed by 2003. In 2008, the company had revenues of USD6.3billion compared with USD3.8billion in 2005.

**Operations Management International (CH2M Hill OMI)**

As the name suggests, CH2M Hill OMI specialises in water and wastewater O&M contracts for municipal and industrial clients. The company was founded by CH2M Hill in 1980. Its first O&M contract was awarded by Lebanon, Oregon in 1982 and this was renewed for as further 10 years in 2007. OMI currently operates 200 water and wastewater facilities, against 150 in 1999 and has 1,600 staff. It is estimated that the company serves 3.5million people and is the fourth largest municipal O&M player in the USA, with revenues of USD181million in 2005. In addition, CH2M Hill OMI serves a number of industrial clients, generating revenues of approximately USD30million pa. The company is currently active in 30 states in the USA and in Canada and Puerto Rico.

**OMI – some major contracts**

2001	Seattle, WA	25 year DBO	Water treatment
2002	Sandy, Oregon	5 year O&M	Wastewater treatment
2002	Genoa, Michigan	3 year O&M	Water & wastewater treatment
2002	Rio Rancho, NM	5 year O&M	Water & wastewater treatment
2002	Stockton, CA	20 year O&M	Water & wastewater treatment
2003	Havana, Florida	3 year O&M	Wastewater treatment
2003	Fort Campbell, KY	50 year O, O&M	Water & wastewater treatment
2004 [1]	Eldorado, NM	4+4 year O&M	Water treatment
2005	Clovia, CA	15 year DBO	Wastewater treatment & reuse
2007 [1]	Lebanon, Ore	10 year O&M	Water & municipal services
2008 [1]	Grants, NM	20 year O&M	Water & wastewater treatment
2008 [1]	Prescott Valley, AZ	5 year O&M	Water & wastewater treatment

[1] Contract renewals

The Fort Campbell contract covers all the ownership and all operations for the 101<sup>st</sup> Airborne Division's headquarters, covering 3,000 buildings and 4,000 housing units, with a 7.6million gallon per day water treatment plant and a 4.0million gallons per day wastewater treatment plant. The total contract is worth USD700million. In Seattle, the new Cedar Treatment Facility will provide 70% of the water used by the city's 1.3million people and will save Seattle USD50million over the life of the contract. The water treatment facility is expected to be operating by the end of 2004 and will cost USD109million to design, build and operate for 25 years. The Stockton contract was originally awarded to OMI's joint venture with Thames Water and is intended to save the city USD65million in engineering fees and USD110million in other operational costs.

**Contact Details**

Name: CH2M Hill  
 Address: 9191 South Jamaica Street,  
 Englewood CO, 80112, USA  
 Tel: (303) 771 0900  
 Fax: (303) 286 9250  
 Web: [www.ch2m.com](http://www.ch2m.com)  
 Web: [www.omiinc.com](http://www.omiinc.com)

Lee A McIntire (Chairman and CEO)  
 Catherine Santee (Finance Director)  
 Elisa M Speranza (President, CH2M Hill OMI)



**CONNECTICUT WATER SERVICE COMPANY**

The Connecticut Water Service Company (CWS) was founded in 1956 as Suburban Water Service, Inc and has concentrated on acquiring and operating water companies through controlling stock ownership. The oldest system in CWS's franchise was formed in 1849. Since 1969, the company has been selling off its excess real estate holdings. In 1975, the company changed its name to Connecticut Water Service Inc., after acquiring all of the outstanding Common Stock of CWS. In 1999 CWS established Connecticut Water Utility Services (CWUS) to handle the non-regulated business activities previously transacted by CWS, its regulated subsidiary. 9% of revenues in 2005 were derived from the non-regulated activities. CWS was subsequently renamed New England Water Utility Services (NEWUS).

**CWS, number of customers**

Y/E 31/12	2007	2008	2009
Residential	75,579	78,254	78,820
Commercial	5,532	5,646	5,690
Industrial	426	425	425
Public Authorities	1,599	1,648	1,705
Fire & Non-Metered	680	782	1,286
<b>Total</b>	<b>84,418</b>	<b>87,361</b>	<b>88,534</b>

CWS supplied water to 88,354 customers in 2009, against 70,067 in 2000. 90% of customers are residential, 7% industrial and commercial and 3% other customers. These are based in three separate operating regions including 54 towns in Connecticut. The service areas have a total population of 300,000. In 1999 CWS acquired Gallup Water Service Inc., and Crystal Water Utilities Corporation. These two systems were merged as the Crystal Water Company of Danielson in 2005. In December 2001, the company made a USD6.3million agreed bid for Unionville Water, a CT based company with 5,400 customers or 14,000 people at the time. USD27million was spent on capital spending in 2009

Between 2006 and 2009 seven utilities were acquired, serving 4,000 customers in total. Two utilities, serving at total of 500 customers were acquired in the first half of 2010.

In January 2008, the company acquired Birmingham Utilities' Eastern Operations, which serve 2,200 customers (7,500 people) in 15 towns in the state for USD3.5million. The activities are expected to generate revenues of USD1.6million pa. Two small acquisitions completed in 2007 (Avery Heights and the Hilldale Park Homeowner's Association) added a further 300 connections (1,000 people) to the company's activities in CT. In July 2008, the company acquired the Ellington Acres Company which serves 750 customers (2,300 people) in Ellington, CT. The acquisition cost USD1.495million and links to the 36,000 customers already served in the vicinity by the company

**Connecticut Water Service Co., profit and loss account**

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
<b>Turnover</b>					
Residential	29.98	29.07	38.35	37.69	36.47
Commercial	5.62	5.65	6.76	7.15	6.73
Industrial	1.54	1.59	1.76	1.82	1.46
Public Authorities	1.63	1.51	1.92	2.03	1.93
Fire & Non-Metered	8.67	9.13	10.22	10.61	10.93
Total turnover	47.45	46.45	59.03	61.27	59.39
Utility operating profits	10.54	7.53	13.25	13.98	13.09
Net income	7.17	6.71	8.78	9.39	10.17
Earnings per share (USD)	0.89	0.81	1.06	1.12	1.20
Dividends per share (USD)	0.85	0.86	0.87	0.88	0.90

The fall in utility revenues between 2007 and 2009 reflects lower water sales, falling from a total of 7,257million gallons in 2007 to 6,472million gallons in 2009.

In February 2001, CWS acquired Barnstable Holding Company for USD6.5million. Barnstable owns the Barnstable Water Company, which serves 7,200 customers in Barnstable, Massachusetts. In 2005, the town of Barnstable acquired this system and allied real estate for USD11.0million under the terms of its original charter agreed in 1911.

The New England Water Utility Services, Inc. (NEWUS), provides water and wastewater related services to residential, commercial, industrial and municipal clients throughout Connecticut, Massachusetts, and Rhode Island. Services include: Contract operation of water and wastewater systems for other utilities, businesses, municipalities, and the University of Connecticut's Storrs Campus and emergency water delivery to hospitals, businesses and private well owners via tanker truck.

**Contact Details**

Name: Connecticut Water Service  
Address: 93 West Main Street,  
Clinton, CT 06413  
Tel: +1 860 669 8636  
Fax: +1 860 669 9326  
Web: [www.ctwater.com](http://www.ctwater.com)

Eric W Thornburg (Chairman, President and CEO)  
David C. Benoit (Vice President Finance/Treasurer)  
Terrance O'Neill (Vice President Operations)

## GLOBAL WATER RESOURCES

Global Water Resources, Inc. is a regulated water utility that provides water, wastewater and recycled water utility services. The Company owns and operates 16 water and wastewater utilities in metropolitan Phoenix, Arizona. It serves 38,000 customers (110,000 people) in a 378square mile service areas. At the start of 2005, the company served 20,000 people. In May 2008, the company filed a registration statement for an IPO on the NASDAQ Global Select Market. It appears that the IPO has been held back due to market conditions.

The company opened a groundwater recharge facility in February 2007, which is permitted for 50,000 acre-feet of recharge per year and has started operating at 25,000acre-feet per year. The facility is adjacent to the Central Arizona Project canal and the Hassayampa River. Colorado River water is extracted from the canal and introduced to the bed of the Hassayampa River where it recharges the underlying aquifer.

In June 2005 the company acquired Sonoran Utilities Services, LLC in the City of Maricopa, adjacent to the company's Santa Cruz Water Company and Palo Verde Utilities Company. The City of Maricopa has seen over 600 building permits requested each month, fitting in with GWR's plans to adding over 300 customers a month in the area. The Cave Creek Water Company, which operates utilities in the Phoenix area was acquired in March 2005.

In July 2006 Global Water Resources acquired West Maricopa Combine, the parent company of Valencia Water Company in the City of Buckeye, Willow Valley Water Company near Bullhead City, Water Utility of Greater Buckeye near Buckeye, Water Utility of Greater Tonopah west of the Hassayampa River and Water Utility of Northern Scottsdale located in northeast Scottsdale. These companies serve an area of 80square miles, earmarked for 135,000 houses.

In October 2007 Global Water Resources acquired Balterra Sewer Corp., a wastewater provider for an area in unincorporated western Maricopa County known as Tonopah. The Water Utility of Greater Tonopah ("WUGT"), a Global Water affiliate, is currently the area's primary water supplier.

In September 2008, Global Water Resources announced that it had entered into a Memorandum of Understanding with the City of Eloy in Arizona for the provision of water, wastewater and recycled water infrastructure for the eastern portion of Eloy's planning area.

### Contact Details

Name: Global Water Resources LLC  
Address: 21410 N 19th Avenue, Suite 201  
Phoenix, AZ 85027  
Tel: 623-518-4000  
Fax: 623-518-4100  
Web: [www.gwresources.com](http://www.gwresources.com)

Trevor Hill (President and CEO)

**HAN'S TECHNOLOGIES INC**

Hans Technologies is a privately held company, which has gained a series of BOT contracts in China through its Western Water subsidiary since 2004. The company was incorporated in 1996 and has been developing engineering projects in China since 1998, with a total treatment capacity of 1.0m<sup>3</sup> per day having been installed to date.

2004	Bijie	BOT	80,000, water
------	-------	-----	---------------

A 75,000 m<sup>3</sup> per day WTW and 30 miles of piping was built between 2004 and 2006 to serve Qian-Xi, Bijie Prefecture in Guizhou. It entered service in September 2006.

2004	Na-yong	BOT	50,000, water
------	---------	-----	---------------

A 25,000m<sup>3</sup> per day WTW and 10 miles of piping was built between 2004 and 2005 to serve the town in Guizhou. The BOT was later sold back to the government.

2004	Zhi-jin	BOT	70,000, water
------	---------	-----	---------------

A 22,500m<sup>3</sup> per day WTW was built between 2004 and 2005 to serve the town in Guizhou. It entered service in 2005.

2005	He-zhang	BOT	50,000, water
------	----------	-----	---------------

A 15,000m<sup>3</sup> per day WTW was added to the extant WTW along with seven miles of piping to serve the city in Guizhou. It entered service in October 2007.

2005	Da-fang	BOT	80,000, water
------	---------	-----	---------------

A WTW, new piping and a dam are being built between 2005 and 2010 to overhaul the county in Guizhou's water services. They currently serve 25% of the population.

2005	Xitang	30 year BOT	300,000, wastewater
------	--------	-------------	---------------------

A 35,000 m<sup>3</sup> per day WWTW entered service in July 2007, serving the town and industries in Guizhou. In 2009, it was expanded to 70,000m<sup>3</sup> per day.

2008	Yiliang	BOT	100,000, wastewater
------	---------	-----	---------------------

A 20,000m<sup>3</sup> per day WWTW is to serve the Huaxing Water Town in Yiliang County, Kunming, Yunnan. Construction took place between 2008 and 2010.

2008	Ninghua	30 year BOT	150,000, wastewater
------	---------	-------------	---------------------

A 40,000m<sup>3</sup> per day WWTW is to be constructed in two phases to serve Ninghua County, Sanming Prefecture in Fujian Province. Construction started in August 2008 and continued to 2010.

2009	Zanyi	30 year BOT	100,000, wastewater
------	-------	-------------	---------------------

A 20,000m<sup>3</sup> per day WWTW is to serve Zanyi in Yunnan Province. It can be expanded to 50,000m<sup>3</sup> per day and construction of the initial plant took place between 2009 and 2010.

**Contact Details**

Name: Han's Technologies  
 Address: 1300 Clay Street, Suite 600,  
 Oakland CA 94612  
 Tel: +1 510 464 8018  
 Fax: +1 510 464 8001  
 Web: [www.hanstech.net](http://www.hanstech.net)

**MIDDLESEX WATER COMPANY**

Middlesex Water Company (MWC) is involved in wholesale and retail water supply for domestic, commercial, industrial and fire protection customers in New Jersey and Delaware, (with New Jersey being the main market). The company was incorporated in 1897 and operates water utility systems in central and southern New Jersey and in Delaware since 1992, as well as a wastewater utility in southern New Jersey. MWC has 107,000 regulated and non-regulated water customers and 20,100 wastewater customers and the company serves approximately 375,000 people with water and 70,000 people with sewerage. In 2009, the company expanded into Pennsylvania.

The Middlesex System in central New Jersey produced 69% of the MWC's 2005 revenues, providing water to 59,800 retail customers, primarily in eastern Middlesex County, New Jersey, a population of 303,000. 7% of the Middlesex System's water was purchased from E'Town Water. The remaining 23% was obtained through groundwater. There are nine further subsidiaries:

[1] Tidewater Utilities Inc. and Southern Shores; serving 33,200 retail customers in 271 separate community water systems in Kent, Sussex and New Castle Counties, Delaware, along with 7,200 water and wastewater customers served by White Marsh through 68 O&M contracts. Total customers in the state number 43,400 compared with 3,000 in 1992.

[2] Pinelands Water Company services 2,400 residential customers in Burlington County, New Jersey.

[3] Pinelands Wastewater Company services 2,300 primarily residential retail customers and, under contract, one municipal wastewater system in Burlington County, New Jersey with about 200 residential customers.

[4] Utility Service Affiliates Inc, along with MWC, started a 5 year contract with the City of South Amboy, New Jersey to operate and maintain the city's 2,600 customer water system in May 1995. The contract has been renewed to 2045.

[5] Utility Service Affiliates (Perth Amboy) Inc, along with MWC, signed an agreement in 1998 with the city of Perth Amboy to operate and maintain the City's water and wastewater systems for its 9,300 customers (40,000 people) for 20 years. USA-PA will be paid a fixed fee and a variable fee based on increased system billings.

[6] Bayview has 300 customers in Cumberland County, NJ. Bayview was incorporated into the Middlesex system at the start of 2006.

[7] Twin Lakes, acquired in November 2009 serves 120 customers in the township of Shohola, Pike County, Pennsylvania.

[8] Montague Water Company was acquired in March 2010, serving 2,000 people in Montague Township, north western New Jersey.

Agreements have also been developed in Maryland and North Carolina in 2008.

88% of revenues in 2009 came from regulated activities, compared with 90% in 2007.

**Middlesex Water Co., turnover by activity (USDmillion)**

	2005	2006	2007	2008	2009
Residential	31.29	34.58	38.79	41.05	40.96
Commercial	7.30	8.11	8.39	8.79	8.55
Industrial	8.18	8.66	8.51	8.51	8.52
Fire protection	7.74	8.64	8.88	9.46	9.58
Contract sales	10.02	9.94	10.75	11.89	11.94
Contract operations	8.08	8.88	8.83	9.53	9.93
Other	2.00	2.26	1.99	1.80	2.04

**Middlesex Water Co., profit and loss account**

<b>Y/E 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover	74.61	81.06	86.11	91.04	91.24
Operating profits	17.22	21.32	22.67	24.02	20.16
Net income	8.48	10.04	11.84	12.21	9.98
Earnings per share (USD)	0.71	0.82	0.87	0.89	0.72

**Contact Details**

Name: Middlesex Water Company  
Address: 1500 Ronson Road, Iselin,  
NJ 08830 USA  
Tel: +1 732 634 1500  
Fax: +1 732 750 5981  
Web: [www.middlesexwater.com](http://www.middlesexwater.com)

J Richard Tompkins (Chairman)  
Dennis W Doll (President and CEO)  
A. Bruce O'Connor (Vice President/CFO)  
Richard M Risoldi (Vice President/Chief Operating Officer)

**PENNICHUCK CORPORATION**

Pennichuck Corporation (PC) owns three subsidiaries operating in southern and central New Hampshire. Pennichuck Water Works Inc. (Pennichuck, 110,000 people), Pennichuck East Utility Inc. (Pennichuck East) and Pittsfield Aqueduct Company Inc (Pittsfield), provide drinking water to 30,032 residential and 2,000 commercial and industrial customers. The company was founded in 1983 to operate the assets of Pennichuck Water Works, which was first established in 1852. Pennichuck East & Pittsfield were both acquired in 1998. In January 2005 three water systems were acquired: the Locke Lake water system in Barnstead, the Birch Hill water system in Conway and the Sunrise Estates water system in Middleton. When the acquisitions have been approved, they will be incorporated into the Pittsfield operations. In addition, the Pennichuck Water Services Corporation provides O&M services to Hudson, New Hampshire. Overall, PC serves 130,000 customers in 23 towns and cities in New Hampshire. Pennichuck East gained 146 new customers from the acquisition of three small systems in 2007 and a further 48 connections were acquired in the Windham part of the Pennichuck East area in May 2008.

**Pennichuck Corporation breakdown**

<b>FY 31/12/2009 (USDmillion)</b>	<b>Customers</b>	<b>Revenues</b>
Pennichuck Water	26,200	23.40
Pennichuck East	5,600	5.04
Pittsfield	1,800	1.55

Non-regulated water contract operations generated revenues of USD2.05million in 2005, against USD1.93million in 2004. The principal contracts gained to date have been for Hudson, New Hampshire (contract awarded 1998, renewed in 2005), Salisbury, Massachusetts (awarded 2001, and re-awarded in September 2007 to 2012, serving 9,000 people) and Barnstable, Massachusetts (commencing in 2006).

**Pennichuck Corp., profit and loss account**

<b>Y/E 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Turnover – Utilities	21.55	21.97	27.22	28.30	29.99
Turnover – Water management	2.05	2.33	2.29	2.64	2.77
Turnover – Other	0.26	0.17	0.03	0.03	0.01
Turnover	23.86	24.48	29.54	30.98	32.77
Net income	0.48	0.57	3.58	4.72	2.38
Earnings per share (USD)	0.13	0.14	0.85	1.11	0.55

**Aborted bid by PSC and Municipal counter-bid**

Philadelphia Suburban Corp (now Aqua America) made an agreed bid for Pennichuck in May 2002. The bid was abandoned in February 2003 when a referendum in Nashua, New Hampshire sought to authorise the municipal acquisition of Pennichuck for USD121million. In May 2003, the town of Pittsfield voted to seek to acquire the Pittsfield Aqueduct Co, which was acquired by Pennichuck in 1998. Various hearings were held through 2007 without any progress being made by either side. In July 2008, the New Hampshire Public Utilities Commission announced that the city could acquire the system for USD243million. Following a ruling by the New Hampshire Supreme Court in March 2010, the acquisition can go ahead, providing the city finds the price acceptable.

**Contact Details**

Name: Pennichuck Corporation  
Address: Four Water Street, Nashua, NH 03061, USA  
Tel: +1 603 882 5191  
Fax: +1 603 882 4125  
Web: [www.pennichuck.com](http://www.pennichuck.com)

Duane C Montopoli (President and CEO)  
Thomas C Leopard (Vice President, Treasurer and CFO)

**PICO HOLDINGS INC**

The Physicians Insurance Company of Ohio (PICO) is a holding company specialising in the acquisition of apparently undervalued assets. The company seeks to develop a portfolio of water assets for sale to municipal and industrial clients.

**PICO Holdings Inc, profit and loss account**

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Turnover	142.11	82.72	33.93	60.35	16.03
Operating profit	40.33	50.87	2.01	56.39	-41.02
Net profit	16.20	29.24	-1.27	28.90	-21.76
Earnings per share (USD)	1.25	1.95	-0.07	1,52	-0.86

PICO entered the water rights market in 1995 through the acquisition of Vidler Water Co. Currently, Vidler controls water rights in Nevada (11,306 acre-feet plus applications for up to 100,000 acre-feet outstanding), Arizona (37,795 acre-feet plus 13,764 acre-feet under option) and Colorado (268 acre-feet, these operations are in the process of being sold off). Revenues are generated by the sale of land and water rights and from the selling of water to third parties. Nevada Land and Resource Company (NLRC) was acquired in 1996 for USD48.6million. NLRC currently owns 5,582 acre-feet of water rights in Nevada and is applying for up to 105,506 acre-feet of additional water rights. In Arizona, the Vidler Arizona Recharge Facility has an estimated capacity of 1million acre-feet with an annual recharge capacity of 35,000 acre-feet. Vidler currently has net recharge credits of 217,000 acre feet through this facility. In January 2010, Vidler acquired 126,000 acre feet of stored water credits in the Roosevelt Water Conservation District of Arizona for USD15.75million.

The Semitropic water storage facility in California holds the right to store 30,000 acre-feet of water until 2035, with an annual recovery of 2,700-6,800 acre-feet per annum. In July 2008 Vidler Water sold the company's interests in Semitropic to the San Diego Water Authority for USD11.7million resulting in a net gain of USD8.7million. A closing sale of 10,252 acre feet for USD3.1million was concluded in 2009.

**Water Rights held by Pico, 09-2008**

System	State	Status	Acre-feet
Harquahala, La Paz County	Arizona	Owned	3,840
Fish Springs Ranch	Nevada	51% Owned	12,897
Lincoln County	Nevada	Application	40,000
Sandy Valley	Nevada	Owned	415
Sandy Valley	Nevada	Application	2,000
Dry Lake Valley	Nevada	Owned	1,009
Muddy River	Nevada	Owned	267
Carson River	Nevada	Owned	4,700
Carson River	Nevada	Option	2,800
Colorado	Colorado	Owned	173
Boise	Idaho	Owned	7,044

7,897 acre-feet from Fish Springs Ranch has been designated as water credits for the north valleys of San Reno and Vidler has constructed 35 miles of pipeline to deliver this water.

In March 2002, PICO sold 2,645 acre-feet of transferable ground water in Harquahala Valley, Arizona for USD1,450 per acre-foot. A further 480 acre-feet were sold in May 2002 for USD2,083 per acre-foot. Sales since 2001 have generated USD15.6million in revenues and USD4.8million in gross margins. In 2001, Vidler Water Company sold 83.8% of its original interests in the Semitropic Water Banking and Exchange Program for USD10.2million, with a gross margin of USD5.7million. Vidler sold 44,000 acres of land in 2003, generating USD14.8million in revenues and USD4.6million to gross margins. In 2005, Vidler sold 42,000 acre-feet of water rights in the Harquahala Valley Irrigation District of Arizona for USD94.4million at USD2,200 per acre-foot, with a net gain of USD55.5million.



In Colorado, small scale sales of water rights have taken place: 0.6 acre feet for USD45,000 in 2007, 3.9 acre feet for USD302,000 in 2008 and 1.6 acre feet for USD127,000 in 2009. The rest of the Colorado assets are available for sale or lease.

#### Vidler and NRLC, profit and loss account

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
<b>Vidler</b>					
Turnover	106.4	3.0	7.9	11.3	4.3
Pre-tax profit	56.2	-2.5	-5.3	4.2	-16.9
<b>NRLC</b>					
Turnover	21.8	41.4	13.5	N/A	N/A
Pre-tax profit	12.0	30.5	8.1	N/A	N/A

Vidler and NRLC results have been combined for 2008 and 2009.

Vidler and NRLC aim to secure and develop water rights where needed for strategic municipal and industrial customers. These assets can then either be sold, leased or traded as market conditions permit. NRLC's income derives from land sales and royalties. These markets fluctuate from year-to-year. To date NRLC has sold water rights worth USD894,000.

#### Contact Details

Name: PICO Holdings Inc  
 Address: 875 Prospect Street, Suite 301,  
 La Jolla, CA 92037-4264, USA  
 Tel: +(858) 456 6022  
 Fax: +(858) 456 6480  
 Web: www.picoholdings.com  
 Web: www.vidlerwater.com

John D Weil (Chairman)  
 John R Hart (President and CEO)  
 Richard H Sharpe (Chief Operating Officer)  
 Maxim C. W. Webb (CFO)  
 Dorothy Timian-Palmer (President and CEO, Vidler Water & NRLC)

**PURE CYCLE CORP**

Pure Cycle Corporation was founded in 1976 to provide water and wastewater services to customers located in the Denver metropolitan area. The Company designs, constructs, operates and maintains systems serving the customers. Water and wastewater services are provided to cities, municipalities and special districts. The Company also owns patented water recycling technologies for the recovery of wastewater into potable water.

In 1996, the Company entered into a long-term agreement to provide water and wastewater services to the Lowry Range, a district with 27,000 acres of primarily undeveloped land in the greater Denver metropolitan area, with 26,700 acre-feet of water which has the potential to serve 78,100 single family equivalent households.

<b>Rights</b>	<b>(acre-feet)</b>
Denver basin groundwater, Lowry Range	26,700
Junior South Platte River water	8,125
Surface storage	29,262
Senior Arkansas River 1883 water rights	60,000
<b>Conditionally decreed water rights</b>	<b>(acre-feet)</b>
Paradise Water Supply, Colorado	70,000

In 2006, the company acquired 23% of the Fort Lyon Canal Company and through this the rights to 60,000 acre feet of senior Arkansas River water rights with 40,000 acre-feet per year withdrawal and 17,500 acres of farmland. The river water will be diverted from agricultural irrigation (with the farmland being restored as non-irrigated land) and piped from the Fort Lyon Canal to Denver via a 150 mile USD400million pipeline. As the transfer is to be self-financed, it is not going to commence for many years. This increases the company's capacity by 102,000 single family equivalent households, with potential usage fees of USD100million pa at annual fees of USD600 for water and USD400 for wastewater per household. A slowdown in the housing market since 2005 has impacted tap connection revenues.

<b>Y/E 31/08 (USD000)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water usage revenues	152	164	150	160	139
Wastewater processing revenues	58	59	60	67	67
Other revenues	25	49	56	56	56
Total revenues	234	272	266	282	260
Operating profit	-1,151	-1,359	-2,654	-2,493	-2,139
Net profit	-1,051	-793	-6,915	-6,927	-5,728
Earnings per share (USD)	-0.08	-0.05	-0.37	-0.34	-0.28

In May 2004, Pure Cycle signed a long-term contract to provide water service to the Hills at Sky Ranch, a planned unit development in unincorporated Arapahoe County. Plans for the Hills at Sky Ranch provide for approximately 850 residences along with parks, open space and retail and commercial areas. The Hills at Sky Ranch is situated on 160 acres located about 8 miles south of Denver International Airport and adjoins the 760-acre, 4,000 dwelling unit Sky Ranch development to which the Company will also provide water service. Revenues are currently gained from delivering water to the Fairgrounds on Lowry Range (44.4million gallons in 2007), operating a wastewater treatment plant (20,000 gallons per day treated with an operational capacity of 130,000 gallons per day).

**Contact Details**

Name: Pure Cycle Corporation  
Address: 500 East 8<sup>th</sup> Avenue, Suite 201,  
Denver, CO 80203, USA  
Tel: +1 303 292 3456  
Web: [www.purecyclewater.com](http://www.purecyclewater.com)

Harrison H Augur (Chairman)  
Mark W Harding (President and CFO)

**SJW CORP**

SJW Corporation (SJW) was incorporated in California in 1985, serving what is now called Silicon Valley. It is a holding company with two wholly owned subsidiaries, San Jose Water Company and SJW Land Company. In addition, SJW also holds 1.10million shares in the California Water Service Group (CWSG). Altogether, 99% of revenues over the past 3 years have been generated by the water activities, while dividends from CWSG have contributed 7% of profits during the same period.

The San Jose Water Company was incorporated in 1931, succeeding a business founded in 1866. The Company provides water to 1.059million people via 234,900 connections in an area of 138 square miles in the metropolitan San Jose area, an increase of 56,400 over the 2005 figure. Population growth within its service area has resulted in long term growth in its customer base. The company provides water services to customers in parts of Cupertino and San Jose and in Campbell, Monte Sereno, Saratoga, Los Gatos, and the surrounding areas in the County of Santa Clara in California. 40-45% of SJW's water is bought from third parties, the cost of which has risen from USD36.7million in 2003 to USD48.6million in 2007. Since 1997, a programme for renovating and replacing the company's water assets has been under way, most of which were developed between 1945 and 1980. Capital spending for 2010-14 has been budgeted at USD439million.

In October 1997, SJWC commenced operation of the city of Cupertino municipal water system under terms of a 25 year lease. The system is adjacent to the existing San Jose Water Company service area and has 4,400 customers. SJWC made a USD6.8million lease payment to the city, which will be amortised over the lease term. The company is responsible for all aspects of system operation, including capital improvements.

**SJW Corp., profit and loss account**

<b>Y/E 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Water – Residential & commercial	161.62	169.25	182.92	195.90	195.76
Water – Industrial	1.04	1.12	1.29	1.07	0.92
Water – Public authorities	8.90	8.90	10.47	11.23	9.97
Water – Others	3.96	4.54	5.33	5.61	5.62
SJW Land	3.32	4.32	6.49	6.55	3.83
Other	1.26	1.11	0.11	0.00	0.00
Group Turnover	180.11	189.24	206.60	220.35	216.10
Operating profit	29.02	31.55	29.75	32.89	29.40
Net income	21.84	38.58	19.23	24.16	15.17
Earnings per share (USD)	1.20	2.11	1.05	1.17	0.82
Dividends per share (USD)	0.53	0.57	0.60	0.65	0.66

SJWTX Water Inc, a 97.5% owned subsidiary of SJW Corp was incorporated in the State of Texas in September 2005 for the purpose of acquiring the assets of Canyon Lake Water Supply Corporation (CLWSC), a Texas non-profit water supply corporation. CLWSC is a member-owned non-profit water utility headquartered in Canyon Lake, Texas and serves a population of approximately 36,000 with 9,000 connections in 78 square miles of western Comal County and southern Blanco County near San Antonio. CLWSC was acquired for USD3.2million along with the assumption of USD20million in corporate debt.

**Contact Details**

Name: SJW Corporation  
Address: 374 West Santa Clara Street,  
San Jose, CA 95196, USA  
Tel: +1 408 279 7800  
Fax: +1 408 279 7934  
Web: www.sjwater.com

W. Richard Roth (President/CEO)  
David Green (CFO/Treasurer)  
R S Yoo (Chief Operating Officer)

## SOUTHWEST WATER COMPANY

Southwest Water Company (SWC) was incorporated in California in 1954 and reincorporated in Delaware on June 30, 1988. The company provides water and wastewater services to some 2million people through 700 contracts for managing 460 water treatment plants and 200 wastewater treatment plants in 36 states, mainly California, New Mexico, Texas and Mississippi. The company was reorganised into four operating segments in 2008. Regulated activities cover 144 water systems including 19 acquisitions made between 2000 and 2009. In March 2010 JP Morgan Asset Management launched an agreed bid for the company. This follows problems relating to the company's accounting.

### Utility operations

The Utility division the company's regulated water activities in California, New Mexico and Texas. Suburban Water Systems (SWS) operates in California, New Mexico Utilities Inc (NMUI) in New Mexico (sold in May 2009), and in Alabama, Mississippi and Oklahoma.

SWS was founded in 1907 and serves 311,000 people (70,968 domestic customers) in Los Angeles and Orange County. The city of West Covina's water system was acquired in February 2000 for USD8.5million. This system has 7,000 connections and is near to SWS's existing activities. Customer growth is limited to acquisitions and growth within its existing franchise. In 2007, 73% of Suburban's turnover came from sales to domestic customers, 18% to industrial and commercial customers and 9% to other customers. A small system in northern Mississippi was acquired in 2007, serving 279 water connections and 378 wastewater connections. The company has a further 250 water and wastewater connections in Oklahoma (800 people).

NMUI was acquired in 1969 and operates in Albuquerque and Bernalillo County, New Mexico, now serving 53,000 people having grown from 800 connections in 1969 to 17,318 connections by 2007. The municipality re-acquired the system in 2009 for USD53.9million in cash. These numbers are included in the accounts as discontinued activities.

### Texas Utilities

Texas Utilities consists of the Windermere Utility Company and Hornsby Bend Utility Company (acquired for USD4million in October 2000, based in the suburbs of Austin, with 6,081 connections) and 87 water utilities and 12 wastewater utilities acquired from Tecon Water Holdings for USD66million in July 2004. The activities, now called Monarch Utilities currently serve approximately 21,000 water and 3,500 wastewater connections in Texas. A USD0.7million tuck-in acquisition in 2005 added 370 new water connections and 2,600 connections in 13 water systems in the San Antonio area were acquired in 2007 for USD5.8million. In total, 116,000 people are served in Texas through 123 water systems.

### Southwest Water Company, regulated water / wastewater customer breakdown, 2009

	Revenue (USDmillion)	Water connections	Wastewater connections
California	55.04	75,392	0
Texas / Oklahoma	36.53	33,418	11,209
Alabama / Mississippi	10.13	285	9,652
<b>Total</b>	<b>101.69</b>	<b>109,095</b>	<b>20,861</b>

### SWW – regulated utility system acquisitions since 2004

System	State	Year	Water connections	Wastewater connections	Cost (USDmillion)
Monarch Utilities	Texas	2004	21,000	3,500	66.0
Shelby County	Alabama	2005	0	4,000	8.6
Midway Water	Texas	2005	370	0	0.7
Austin	Texas	2006	244	244	1.4
Mississippi	Mississippi	2007	275	355	0.6

San Antonio	Texas	2007	2,600	0	5.8
Madison County	Alabama	2007	0	120	1.7
Riverview	Alabama	2008	0	4,100	22.5

A wastewater system in Birmingham, Alabama was acquired in January 2008 with 4,100 connections. This is the second largest transaction by SouthWest Water, serving more than 12,000 residents and generating revenues of USD5.2million in 2007. It is adjacent to the company's Shelby County wastewater system which was acquired in 2005 and serves 14,500 people via 4,000 connections.

### Service

The Services Group primarily operates in Texas, New Mexico, California, Colorado, Alabama, Mississippi, Georgia and New Jersey and had 700 contracts in 2007. Its main subsidiary ECO Resources Inc, (ECO) is a wholly owned subsidiary that operates and manages water and wastewater treatment facilities owned by municipalities and other companies. ECO was acquired in 1985 and has 270 municipal utility contracts (MUDs) and 29 operations and management contracts. ECO's MUD activities were reorganised under Texas MUD and serve approximately 600,000 people in Texas. In 2009, 97% of MUD contracts were renewed.

In May 2000, ECO Resources was awarded a 5 year, USD10million extension of its contract to operate and maintain a portion of the water and wastewater utility system of the city of Sugar Land, Texas. As part of the newly approved contract, ECO will expand its service from 7,500 to 12,225 customer connections and will operate and maintain the entire First Colony utility system, located within the city of Sugar Land. In August 2001, SWC acquired 90% of Atlanta-based Operations Technologies Inc. (OpTech), a provider of contract water, wastewater and public works services in the south eastern United States for USD8.2million. OpTech was founded by Robert W. Monette in 1994 and operates utilities in Georgia and Mississippi. In June 2003, a USD30million 10 year water and wastewater O&M contract was gained covering 30,000 households in Pascagoula, Missouri.

In November 2002, SWC acquired the majority of AquaSource's water and wastewater contract operations business for USD10.3million. These include AquaSource's contract operations in Colorado and the Houston area.

### Southwest Water Co., profit and loss account

Y/E 31/12 (USDmillion)	2005	2006	2007	2008	2009
Utilities turnover	N/A	N/A	56.65	60.93	65.17
Texas Utilities turnover	N/A	N/A	27.91	34.78	36.53
O&M Services turnover	N/A	N/A	40.92	40.49	36.98
TEXAS MUD turnover	N/A	N/A	79.32	74.45	72.24
Total turnover	184.28	202.75	204.81	210.66	211.09
Operating profits	8.23	12.17	7.54	-27.10	-11.84
Net income	-0.42	6.22	1.57	-31.94	4.05
Earnings per share (USD)	-0.02	0.27	0.07	-1.31	0.17
Dividends per shares (USD)	0.20	0.21	0.23	0.20	0.10

In January 2000, SWC formed Inland Pacific Water Company (IPWC) a JV designed to develop water-related and wastewater-related opportunities in Southern California's San Bernardino and Riverside counties. On February 25, 2000, SWS purchased West Covina's water distribution system and facilities, assuming ownership and operation of West Covina's water system on that date. The transaction added approximately 7,000 connections to SWS's customer base, an increase of approximately 11%. Covina generates USD5.5million pa in revenues.

### Contact Details

Name: Southwest Water Company  
Address: 624 South Grand Avenue,  
Los Angeles, CA 90017 USA  
Tel: +1 213 929 1800  
Fax: +1 213 929 1888  
Web: www.swwc.com

Mark A Swatek (Chairman and CEO)  
Ben Smith (Interim CFO)

**UTILITIES INC**

Utilities Inc was founded in 1965 and is the holding company for approximately 90 subsidiaries providing residential water and/or wastewater services to more than 300,000 customers (over 1million people in May 2008) in 400 municipalities in Arizona (two companies), Florida (22 companies), Georgia (two companies), Illinois (24 companies), Indiana (three companies), Louisiana (two companies), Maryland (three companies), North Carolina (18 companies), Nevada (four companies), New Jersey (two companies), Pennsylvania (three companies), South Carolina (five companies), Tennessee (Tennessee Water Service), Virginia (two companies) and Kentucky (two companies). 10 subsidiaries were acquired during 2003, increasing the number of people served by 80,000. In 2002, Utilities Inc.'s revenues were USD61million. In 2004, they had increased to USD85million and are approximately USD100million in 2008. 90% of the 2008 customer base was residential, with the rest mainly being light industrial. The 2007 acquisition of the Perkins Mountain Water Company in Arizona added 40,000 customers. In 2009, the acquisition of Sewerage District No. 6 in St. Tammany Parish, Louisiana was completed, adding 940 sewerage customers.

**Customers by State, 2002**

State	Customers
Arizona	5,450
Florida	81,000
Georgia	11,200
Illinois	17,400
Indiana	8,300
Kentucky	7,000
Louisiana	17,100
Maryland	7,000
Mississippi	1,800
New Jersey	1,100
Nevada	12,800
North Carolina	61,100
Ohio	1,100
Pennsylvania	5,500
South Carolina	31,900
Tennessee	500

The activities in Ohio and Mississippi have since been sold. Nuon of the Netherlands acquired Utilities Inc of Chicago in March 2002 for USD275million, having announced the bid in the previous March and undergone regulatory clearance. In May 2005, Nuon announced that it was selling Utilities Inc to Hydro Star. The divestment reflects Nuon's strategy of focusing on the energy markets of North-West Europe. Hydro Star is a subsidiary of AIG Highstar Capital II, L.P, a private equity fund which invests in infrastructure related assets and businesses and is sponsored by AIG Global Investment Group (AIGGIG). AIGGIG member companies are subsidiaries of American International Group, Inc (AIG). The sale was completed in April 2006.

**Contact Details**

Name: Utilities Inc  
Address: 2335 Sanders Road, Northbrook  
Il 60062, USA  
Tel: 001 800 831 2359  
Fax: 001 775 727 7752  
Web: [www.utilitiesinc-usa.com](http://www.utilitiesinc-usa.com)

Lisa Sparrow (President)  
Jim Japczyk (CFO)  
Christopher Lee (Managing Partner, Highstar)

**WESTERN WATER**

Western Water (WW) seeks to identify undervalued water assets and develop and sell them to customers in densely populated areas in the arid western USA. The company operates through the acquisition of water rights and other interests in water, the purchase of real estate for their water rights and the sale or lease of water at various locations in California and Cherry Creek, Colorado. Due to regulatory delays, since 2000, WW has rationalised its operations due to the increased cost of energy, making the pumping of water less competitive, along with the company's increasingly weak financial position. No water sales were made in the 2002 financial year and only one in the 2003 financial year (which generated a gain of USD964,000). As a result, only the Cherry Creek project is currently being actively developed.

In June 2003, WW sold its shares in the Bear Valley Mutual Water Company (South California) to a local city water department, generating cash proceeds of approximately USD723,000 and a gain on the sale of USD79,000. In May and June 2004 WW sold Loma Rica Ranch (Yuba County, California) and Cardozo Ranch (San Bernardino County, California) for USD1.05million, with an aggregate gain of approximately USD85,000 for the Company.

In March 2005, the company sought Chapter 11 protection. In February 2006 a reorganisation plan was approved. This involved the delisting of the company as it no longer has publicly traded shares. On 17<sup>th</sup> November 2005 the company sold its Cherry Creek assets to the Cherry Creek Project Water Authority for USD14million. Cherry Creek Project Water Authority is an intergovernmental entity formed by four local water districts.

After the Cherry Creek sale and the settlement with its debtors, the company will have approximately USD2.6million with which to develop its Yuba Goldfields Water Rights project in California. Currently the water rights are valued at USD0.12million. This water is near to local agricultural distribution systems, including the Yuba County Water Agency's South Yuba Canal which runs through the Goldfields, and the state-wide water distribution system centered on the Sacramento/San Joaquin River Delta.

In 1998, Aguas de Barcelona (Agbar) acquired 10% of WW. Agbar originally intended to increase its stake to 20%, but declined to do so in the light of WW's ongoing difficulties. Currently, Agbar holds 6.7% of WW's equity, along with all of the Class F preferred stock, but this investment has been written down by Agbar.

**Contact Details**

Name: Western Water Company  
Address: 705 Mission Avenue, Suite 200,  
San Rafael, CA 94901  
Tel: +(415) 256-8800  
Fax: +(415) 256-8803  
Web: [www.wwtr.com](http://www.wwtr.com)

Michael Patrick George (President, Chairman, CEO and CFO)  
Reginald M Norris (Director)  
Dennis J Kenny (Director)



## YORK WATER

The York Water Company (YWC) has provided water services for “that good York water” in York County, Pennsylvania, since 1816. The company’s water abstraction has a safe daily yield of 35million gallons, compared with an average daily consumption of 18.2million gallons in 2009, serving 180,000 people. In 1994, 136,000 people were served with 19.7million gallons of water per day. YWC’s service territory has been gradually expanded through the laying of new mains and contracts to sell water to adjoining boroughs. Three service extensions were completed in 2002 and two neighbouring townships (Conewago and Springfield) were connected during 2003. Other income (USD3.01million in 2009) is mainly fire service related.

Industry within the Company’s service territory is diversified, manufacturing such items as furniture, electrical machinery, food products, paper, ordnance, textile products, air conditioning equipment and weight training equipment.

### York Water, operational data

<b>Customers &amp; consumption</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Consumption (gallons/day)	18,657,000	18,769,000	19,058,000	18,289,000	18,233,000
Number of customers	55,731	57,578	58,890	61,527	62,186
Population served	161,000	166,000	171,000	176,000	180,000

The company has two impounding reservoirs. Lake Williams, the lower reservoir, covers 220 acres and holds about 0.87billion gallons of water and Lake Redman, the upper reservoir, covers 290 acres and holds about 1.36billion gallons of water. York Water has a filtration plant half a mile south of the city of York. The company’s Spring Gardens filtration unit has a capacity of 31million gallons per day and is capable of filtering 46million gallons per day during periods of peak demand. YWC installed a 15 mile pipeline from Lake Redman to the Susquehanna River for USD23million in 2004, which boosted the system’s yield from 23million gallons per day to 35million gallons per day.

### York Water, profit and loss account

<b>Y/E 31/12 (USDmillion)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Residential turnover	16.74	17.97	19.72	20.57	23.30
Commercial & industrial turnover	8.01	8.50	9.29	9.67	10.73
Total turnover	26.81	26.66	31.43	32.84	37.04
Operating profit	12.79	12.90	14.10	14.68	17.39
Interest paid	3.42	3.73	3.92	4.11	4.78
Other income	-0.15	0.11	-0.14	-0.51	-0.52
Net profit	5.83	6.09	6.41	3.63	4.58
Earnings per share (USD)	0.56	0.58	0.57	0.57	0.64
Dividends per share (USD)	0.42	0.45	0.48	0.49	0.51

During 2004 and 2005, an additional 351,679 feet of mains were added to the network, more than double the average in the previous three years. A further 307,133 feet of mains were added during 2006 and 2007. 492,466 feet were added during 2008 and 2009. 1,110 customers were added to the network due to two tuck-in acquisitions made during 2005. In 2007, the Pennsylvania Public Utility Commission authorised an increase in the number of municipalities the company can serve from 42 to 46. The water system of the borough of Adamstown was acquired in January 2007, adding 400 customers and the acquisition of the Asbury Pointe and West Mannheim Township system, in 2008 respectively added 250 and 1,800 customers.

### Contact Details

Name: York Water Company  
 Address: 130 East Market Street, York  
 PA 17405-7089 USA  
 Tel: +1 717 845 3601  
 Fax: +1 717 843 3793  
 Web: www.yorkwater.com

Jeffrey R Hines (President and CEO)  
Kathleen M Milner (CFO)

**APPENDIX 1:  
THE WATER CYCLE AND WATER SERVICES**

## APPENDIX 1: THE WATER CYCLE AND WATER SERVICES

### Distribution of water resources

The world's water resources are not a problem. It is their distribution and management in relation to current and future demand that presents challenges. The 'Blue Planet' is aptly named. Evenly distributed upon a perfectly smooth sphere, water would cover the earth to a depth of 2.7km. Freshwater alone would cover the surface to a depth of 70m. However, only 0.16% of the world's water is contained in freshwater lakes and rivers.

### Global breakdown of all water resources (km<sup>3</sup>)

Salt water	1,348,000,000	97.390%
Freshwater	36,020,000	2.610%
- Frozen	27,820,000	2.010%
- Groundwater	8,062,000	0.583%
- Lakes and rivers	225,000	0.016%
- Atmosphere	13,000	0.001%

### Freshwater

Saline or brackish water has at best little utility for life on the land surface. Life upon the land depends on a minimum access to freshwater in a useable form. As the table below highlights, barely 10% of freshwater supplies are even potentially readily available for abstraction. The fragment held in the atmosphere constantly replenishes the river system, in itself a fraction of surface water supplies.

### Global breakdown of freshwater resources

Frozen	77.230%
Groundwater (800-4,000 metres)	12.350%
Groundwater (>800 metres)	9.860%
Freshwater lakes	0.350%
Soil	0.170%
Atmosphere	0.040%
Rivers	0.003%
Plants & animals	0.003%
Water bearing minerals	0.001%

### The water cycle

The water cycle refers to the process whereby water is circulated through the biosphere. The cycle begins with water being precipitated on to the land surface. On reaching the ground, it either infiltrates the soil or runs off into the river system. Water in the soil is either taken up by plants where it is returned to the atmosphere through transpiration, or it percolates through the soil. Once through the soil, it either enters the river system or recharges aquifers (water bearing rock). From the aquifer, water seeps into the river system, is discharged into the sea through coastal springs or is stored in the rock. Some water from both river and ground water is taken up by plants and in turn transpired, but most is discharged into the sea. Evaporation from seawater, along with a small amount from surface waters, is the main source of atmospheric water.

### The global water balance

Even though more water is precipitated upon the oceans than the land surface in relation to their total surface area, the actual process involves more water being taken up from the sea than is returned by precipitation. In total, 500,000km<sup>3</sup> pa of water is taken up and returned through evapotranspiration and precipitation. While 430,000km<sup>3</sup> pa is removed through evaporation from oceans and 70,000km<sup>3</sup> pa in evapotranspiration from land, 110,000km<sup>3</sup> pa is returned to the land through precipitation against 390,000km<sup>3</sup> pa precipitation into the sea. This results in a net gain of 40,000km<sup>3</sup> pa on to land. It is this net gain that sustains life upon the earth's surface.

## Residence times

The longer water is held in a particular place, the less enjoins in the water cycle. While water in the atmosphere and rivers may account for a small fraction of the global total at any one time, its relative mobility means that on average 33 times more water is precipitated each year than is held in the atmosphere at any one time.

### Average residence time for water

Oceans	2,500 years
Groundwater	1,400 years
Lakes	17 years
Rivers	16 days
Atmosphere	8 days

## Water usage

The intensity of water withdrawal depends to a large extent upon how much water is used for power station cooling and for irrigation. Groundwater resources are used mainly for domestic and industrial use, especially in urban areas. These resources are not degraded by domestic and industrial effluents in the direct way that surface waters are. Instead, aquifers may originate well away from areas of effluent discharge and thus their integrity remains relatively unimpaired for quite some time after urban watercourses become unsuitable for use.

Surface water	Groundwater
42,650km <sup>3</sup> pa renewable resources	<10,952km <sup>3</sup> annual recharge
3,414km <sup>3</sup> pa withdrawn	760km <sup>3</sup> pa withdrawn
9% domestic	24% domestic
20% industry	72% industry
71% agriculture	5% agriculture

Desalination plays a localised role in water production. Generation rose from 3km<sup>3</sup> in 1990, rising to 5.3km<sup>3</sup> by 2001. This is equivalent to 1.3% of global water withdrawal.

## Supply and demand – a growing imbalance

If freshwater supplies and humanity were evenly distributed across the land, water resources would not be an issue. However, sources of water supply tend to be mismatched with regard to areas of need. Population growth and urbanisation are placing further pressure on water resources and their management. The number of people living in water stressed countries is projected to climb from 470million to nearly 3billion by 2025. Water stress is defined as countries where there is 1,000–1,700m<sup>3</sup> of freshwater per capita per annum, while water scarcity is where there is less than 1,000m<sup>3</sup> of freshwater per capita per annum. Meanwhile, the population of urban areas in developing economies has been forecast to grow by 160% between 1990 and 2030.

% of population living in:	1975	2000	2015
All urban areas	37.9	47.2	53.7
10million or more	1.7	3.7	4.7
5million to 10million	3.0	2.8	3.7
1million to 5million	8.2	11.1	13.3
500,000 to 1million	4.3	4.8	4.9
Fewer than 500,000	20.8	24.8	27.1

Source: United Nations (2007) *World Urbanization Prospects: The 2007 Revision*, UN, New York

% population increase	Developed		Undeveloped	
	1975-2000	2000-2015	1975-2000	2000-2015
10million or more	2.4%	0.3%	9.5%	11.1%
5million to 10million	-1.7%	0.6%	5.3%	8.8%
1million to 5million	5.4%	2.6%	20.6%	25.7%
500,000 to 1million	0.7%	-0.3%	7.9%	6.7%
Fewer than 500,000	5.7%	2.4%	44.2%	42.0%

Source: United Nations (2007) *World Urbanization Prospects: The 2007 Revision*, UN, New York

There are 14 discrete areas where more than 10million people live in close proximity and water shortages and sanitation problems are one of the central constraints to their development. Over the next 25 years, at least 12 more such areas will exist, none of which currently have adequate water or sewerage infrastructures. At the same time, water use is set to rise by 40% by 2020, with 40% more water being needed for food and 20-70% more for industrial and municipal demand.

#### People living in areas of water stress and scarcity (million people)

Million people	1995		2025	
	Countries	People affected	Countries	People affected
Water stress	24	460.0	48	2,849.5
Water scarcity	18	166.5	29	803.7

#### A slum future?

In 2001, 926million people, or 31.6% of the world's urban population lived in slum areas. 43% of the urban population of less developed economies live in slum areas, compared with 6% in developed economies. The UN ('The Challenge of Slums' 2003) anticipates this figure rising to 2billion by 2033 and 3.5billion by 2050.

#### Percentage of urban population living in slums, 2001

Sub-Saharan Africa	71.9%
South-central Asia	58.0%
East Asia	36.4%
Western Asia	33.1%
Latin America & Caribbean	31.9%
North Africa for	28.2%
Southeast Asia	28.0%
Oceania	24.1%

#### Access to safe water and sanitation

According to the United Nations Environment Programme (UNEP), the number of people without access to safe drinking water will rise from 1.4billion in 1999 to 2.3billion by 2025 in the absence of accelerated capital spending programmes. Approximately 2.6billion people currently do not have adequate access to suitable sanitation. In consequence, some 60,000 people die every day due to waterborne diseases.

At current rates of progress, many countries in Sub-Saharan Africa are unlikely to meet the 2015 Millennium Development Goals (MDGs) before 2100. Indeed, as far as household connection to water goes, coverage in that region and in South Asia has decreased.

#### Percentage of urban population with access to improved water supply within regions, 2008:

	Improved – Total	Improved – Piped to house	Improved – Shared	Unimproved
Sub-Saharan Africa	83%	35%	48%	17%
North Africa	95%	91%	4%	4%
Middle East	98%	96%	2%	2%
South Asia	95%	51%	44%	5%

	Improved – Total	Improved – Piped to house	Improved – Shared	Unimproved
South East Asia	92%	52%	40%	8%
Oceania	92%	N/A	N/A	8%
Latin America & Caribbean	97%	92%	5%	3%
Commonwealth Independent States (CIS)	98%	90%	8%	2%
Developed Countries	100%	98%	2%	0%
World	96%	79%	17%	4%

The CIS, Southern Asia and Sub-Saharan Africa area not on target to meet their sanitation MDGs by 2015. Such is the shortfall that the global target is currently unlikely to be met. The work still needed is emphasised by the fact that 158million people in urban areas in 2006 had no option but to defecate in the open. One of the chief challenges for both water and sanitation is the somewhat perverse tendency of western donors to channel their aid towards the least needy, with appreciably less aid (especially in per capita terms) being directed towards countries in South Asia and Sub-Saharan Africa.

#### Percentage of urban population with access to improved sanitation within regions, 2008:

	Improved	Shared	Unimproved	Open defecation
Sub-Saharan Africa	44%	31%	17%	8%
North Africa	94%	6%	4%	0%
Middle East	94%	6%	0%	0%
South Asia	57%	19%	10%	14%
Oceania	81%	N/A	19%	N/A
South East Asia	79%	10%	3%	8%
Latin America & Caribbean	86%	N/A	12%	2%
CIS	93%	N/A	7%	N/A
Developed Countries	100%	N/A	N/A	0%
World	76%	15%	4%	5%

Source: WHO / UNICEF (2010) *Progress sanitation and drinking-water*, WHO Geneva

The MDGs have made some impact, with the number without access to improved water supplies falling from 1,187million in 1990 to 884million by 2008 (141million in urban areas), but progress since 1990 has been hampered by population growth. In contrast, the sanitation data shows less progress and a greater disparity between the MDG aims and currently projected outcomes, with 2.7billion unserved in 2015 from 2008 data, against a target of 1.7billion and 2.6billion in 1990.

Source: WHO/UNICEF (2006) *Meeting the MDG drinking water and sanitation target: the urban and rural challenge of the decade*. WHO, Switzerland & WHO/UNICEF (2010) *Progress on sanitation and drinking-water*, WHO Geneva

#### Connection rates in major cities:

	Household tap	Sewer
Europe	96%	92%
North America	100%	96%
Latin America & Caribbean	77%	35%
Africa	43%	18%
Asia	77%	45%
Oceania	73%	15%

In excess of 95% of people living in high income countries had satisfactory access to potable water and appropriate sanitation services by 1990, along with 74% access to potable water and 68% access to appropriate sanitation services by 1990 in medium income countries. Concerns in the more developed economies are increasingly being driven by environmental and aesthetic considerations, while those in the less developed economies remain rooted to those of basic public health.

### **The cost of 'free' water**

Safe supplies of water are not free, but neither are the consequences of inadequate provision. The economic cost of poor water supplies and sewerage are in illness (500million affected each year), debilitation (15million rendered 'economically inactive' each year) and death (2-5million dying each year) from water borne diseases and environmental impairment. Yet such supplies are not cheap. In slums around many cities, the cost of (vended) water accounts for a large part of household expenses; 18% in Onitsha, Nigeria and 20% in Port-au-Prince, Haiti, for example. The worst off in fact pay a full cost recovery for water, plus any extra fees that the vendor decides to charge.

### **Pressure points in the water cycle**

Of the 42,650km<sup>3</sup> annual net gains through precipitation on to land, 24,000km<sup>3</sup> is lost as surface run-off in floods, leaving a net 16,000km<sup>3</sup> of usable water input. Approximately 9,000km<sup>3</sup> pa is readily accessible, with an annual abstraction of 3,414km<sup>3</sup> highlighting the scope for local imbalances between water availability and its need. It is evident that the element of the water cycle used by the human economy is not optimally managed. Much of the water abstracted is not put into productive use.

### **Optimising the water cycle**

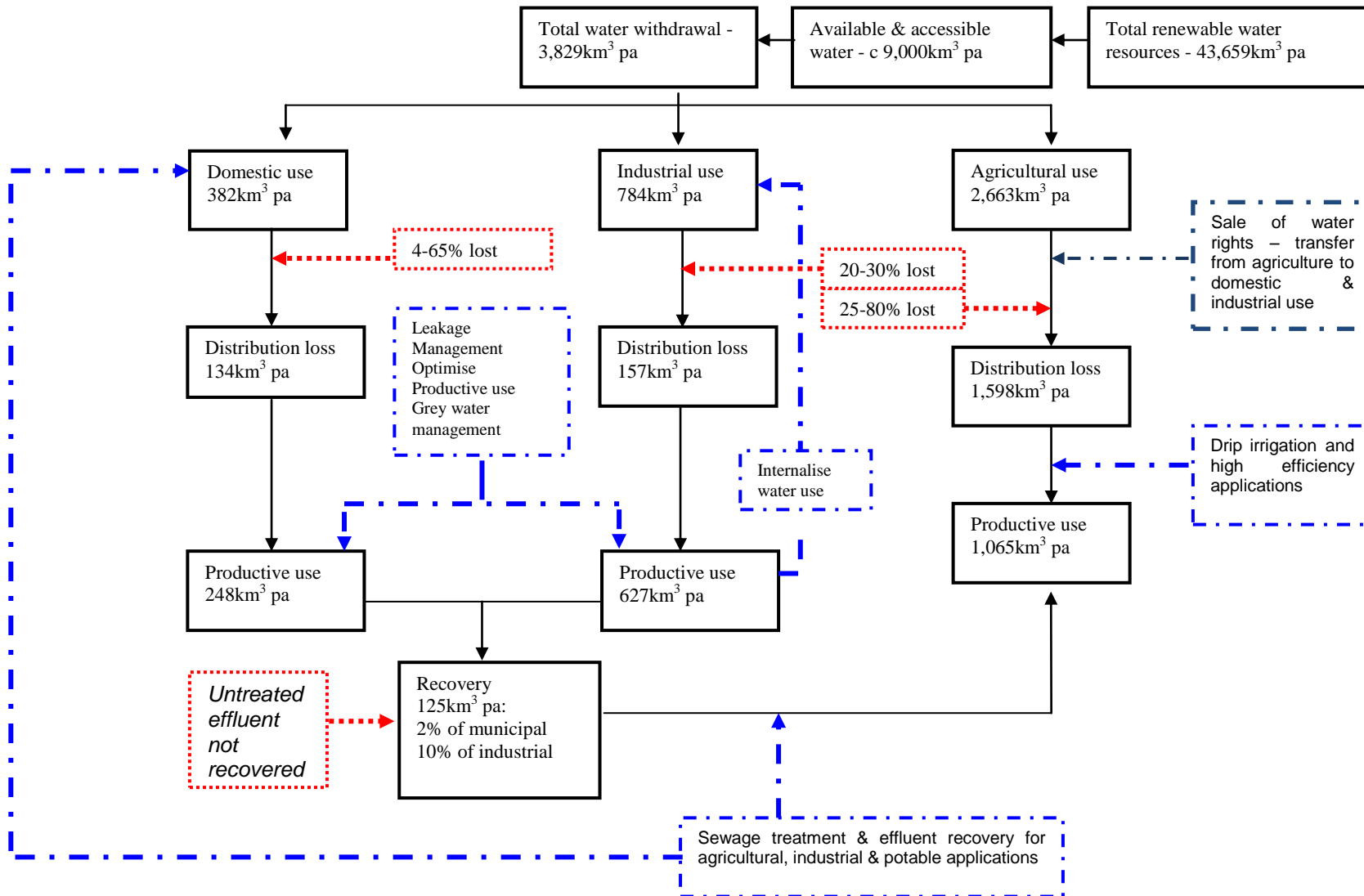
The water cycle needs to be managed in urban areas due to the need for reliable supplies of water of a given quality in a limited area along with the treatment of wastewaters generated by human agency. The management of the water cycle can be broken into four distinct sections: [1] water abstraction and transfer; [2] water treatment and distribution; [3] sewerage; and [4] sewage treatment, disposal and recovery.

Supplies need to be managed so as to maintain the integrity of the water cycle through optimising the productive use of water, preventing over-abstraction from surface water resources, enabling the recharge of groundwater and preventing the pollution of surface and groundwater resources. The flow chart below demonstrates how water technology can be used to mobilise water resources already abstracted into productive use.

Distribution losses for municipal provision can realistically be reduced to 20%, releasing 74km<sup>3</sup> pa for productive use. Assuming that industrial leakage can be reduced to 10%, this releases 120km<sup>3</sup> pa for productive use. Improving irrigation efficiency to 50% releases 244km<sup>3</sup> pa for productive use, along with a further 325km<sup>3</sup> pa of treated municipal water (50% treatment) and industrial water (25% treatment).



Pressure points in the water cycle and their amelioration



**APPENDIX 2:  
PRIVATE SECTOR PARTICIPATION**

## APPENDIX 2: PRIVATE SECTOR PARTICIPATION

### Types of privatisation

One of the difficulties currently facing the water sector's internationalisation is the lack of a common understanding as to the forms of private sector participation. One person's lease contract can, *in extremis*, be another's concession, and so on. An internationally agreed set of concession contract definitions is currently being developed by a number of concerned companies and multilateral organisations.

### Preludes – privatisation through evolution and revolution

Consulting and strategy development and implementation contracts are not regarded as full private sector participation contracts as they are not involved in the management of the actual assets. These contracts are increasingly being used as ways of developing the relationship between a municipality and the private sector company so as to decide on the framework for bringing in private sector management. Privatisation contracts can be gained outright through a bidding process, or they can evolve from contacts established through consulting, construction or engineering activities. A world of opportunities beckons.

Markets can broadly be classified as being primary markets (first privatisations in a country), secondary markets (initial privatisation contracts already awarded, but to less than 10% of population), tertiary markets (major private sector contracts in place, covering 10-50% of the population) and mature markets (significant private sector participation, covering over 50% of people). These market types also reflect the ideas of David Hosein and Paul Rathbone of Andersen, who look at markets in terms of emotion, economic and ideology.

Each market offers a risk-opportunity payoff. Primary markets clearly offer more in terms of opportunities, especially for a new entrant with no established presence in the country. Against this, the privatisation process may be volatile, since there will be limited practical guidance as to how to gauge political, regulatory, economic or operational risk. In mature markets, risk management can be finely tuned, but this information will probably be shared with a broad range of potential competitors, so that the bidding process will be appreciably more competitive. In such a market, an established player will seek to benefit from economies of scale via its extant operations, but may prove vulnerable if there is a desire for change for change's sake.

### Primary markets (first wave)

Primary markets are those yet to experience their first wave of private sector contract awards. These markets may also be split into those where private sector participation is actively under consideration, such as in the Netherlands, South Korea, Nepal and Egypt and those countries such as Switzerland, Iran and Japan that for various reasons have ruled out any material changes for at least the short to medium term. Despite the progress made by the private sector to date, a clear majority of countries remain as primary markets. Privatisation may be initiated through four broad approaches.

**Initial public offering of a corporatised utility.** This approach was first adopted in Brazil through the partial flotation of SABESP (Sao Paulo). The state government still holds 72% of SABESP's equity and has adopted a gradualist strategy towards selling more shares in the company. A more extreme example was in the Czech Republic in 1993, where shares in a number of regional utilities were offered to municipal, institutional and international investors.

**Private sector concession award for one or more small contracts.** A foot-in-the-door approach that concentrates on gaining experience of private sector participation through local contract awards. This approach has been used in a number of European countries without a history of private sector participation such as Norway and Portugal and more recently in Sweden.

**Lease, management and O&M contracts.** A gradualist approach, whereby municipalities and the private sector get to know each other through the increasing delegation of responsibility to the private sector. This approach can be seen at various stages of evolution in Mexico, Mozambique and Kazakhstan. It can be argued that these in turn stem from contacts made with private sector construction and engineering companies over a long period of time as in Egypt and South Africa.

**Major city concession awards.** This is the most abrupt approach, designed to channel private sector investment and management towards infrastructure that has been unable to meet the demands of

urban expansion. This approach is popular in developing economies (for example, Casablanca in Morocco and Manila in the Philippines), with city contracts being on occasion divided into zones (Manila in the Philippines and Jakarta in Indonesia) or into water and sewerage services (Budapest in Hungary). These contracts typically concentrate on capital cities because they are seen as having a lower risk profile than other areas and can thus attract private sector funding more easily. Such is the impact of these contract awards that they often result in countries by-passing the second stage of the market penetration criteria as outlined below.

Outside city-states and special regions such as Macao, national contract awards remain distinctly the exception. Indeed, the only example to date has been for urban sewerage services for Malaysia. Regional contract awards tend to concentrate on rural regions and their provincial towns as in the Czech Republic. The only example of a regional privatisation including major cities to date was the water and sewerage services privatisation in England and Wales.

### **Secondary markets (second wave)**

While cases such as the Czech Republic or Malaysia experienced a far-reaching initial wave of privatisation awards, the initial impact of privatisation is typically of a more piecemeal nature. Secondary markets are defined as countries where less than five contract awards have been made to date and less than 10% of the population receive either water or sewerage services via the private sector. Normally one or two water companies would provide these services.

### **Tertiary markets (third wave)**

Tertiary markets are defined as countries that have between 10% and 50% of their population served by the private sector, usually via six or more separate contracts provided by at least two companies. Such a market share can be attained via a single major city concession award as in the case of major city contracts, via a single award. Examples of the former include Spain and the USA, while examples of the latter include Estonia and Bulgaria.

### **Mature markets**

This covers countries where more than 50% of the population is served by the private sector. Opportunities exist as new markets are developed in response to environmental compliance (for example, sewerage services in France) or through a specific regulatory exercise (for example, inset appointments and MOD privatisation in England and Wales). Otherwise, apart from acquiring extant companies, most opportunities are to be found in rural areas and small towns, placing the emphasis on developing economies of scale and integrating a large number of small contracts into a coherent management structure. To date, the only examples are to be found in France, the Czech Republic, Chile and England and Wales.

### **Differing levels of private sector involvement**

#### **Commercialisation**

Commercialisation calls for the municipal water and/or sewerage entity to be operated as a free standing concern that does not involve cross subsidies with other municipal services and runs on a self-financing basis. A commercialisation strategy has been adopted in a wide number of countries either as an end in itself or as a prelude to more extensive private sector participation. Madrid's Canal Isabel II has operated as a commercialised entity since 1853, without any firm plans for privatisation to date. In Australia, Sydney Water has been commercialised, with bulk water provision services being handed over to the private sector. Prior to the current privatisation programme, Chile has used commercialisation allied with short-term service contracts, delegating responsibility to the private sector for a narrow range of services such as meter installation. Santiago's EMOS is the most notable example, having been commercialised in 1989 and sold in 1999. Other examples include a number of German cities (e.g. Hamburg), South Africa's Umgeni Water and Thailand's municipal and provincial water authorities.

A hybrid privatisation has emerged from a number of these commercial entities where the municipality floats some of the shares of the entity while retaining majority ownership and therefore management control. The best example is in Brazil, where Rio's SABESP is actively traded on the national Bourse, while the municipality for the time being retains 72% of the company's equity. 49% of Belgium's Aquafin has been sold to a number of corporate and institutional investors, with overall control being retained by MVW, the region's sewerage management agency.

### **O&M and lease contracts**

The next step up involves awarding Operations & maintenance (O&M) or lease contracts. O&M contracts usually operate on a fixed fee basis. Lease contracts typically involve asset operation and tariffs, but not capital expenditure. These two types of contract do not delegate full financial responsibility to the private operator, especially with regards to private capital investments.

### **Concessions**

Concessions involve the private sector operation of assets in order to pay for new facilities and upgrading work. Build-own-operate (BOO) and build-operate-transfer (BOT) contracts sell specific services to the municipality in relation to a specific programme of capital improvements, while the full utility concession contract embraces all aspects of service provision and capital spending. These contracts require a much more specific regulatory environment so as to account for the elements of risk involved. Other varieties sometimes seen are BOTT (build, operate, train and transfer) and DFBOT (design, finance, build, operate and transfer) contracts.

A BOO/BOT project's cash flow is usually contractually pre-determined, often with government backing. There is an element of construction risk, but the absence of market risk means that the project can have more debt loaded in than in a full utility privatisation. A project's construction risk can be mitigated whereby a facility already generating cash flow gets taken over for expansion by the private sector. Therefore BOT/BOO projects are an effective means of rapidly organising private capital and management towards a narrow range of services. However, some of the simpler project-oriented contracts do not affect the utility's management and operation, thus underlying problems such as leakage (and illegal interception), over-staffing and poor tariff collection may not be addressed. In these cases, the underlying utility remains uncreditworthy, and it can be argued that a BOO/BOT contract may therefore in fact delay system-wide improvements.

In full utility concessions, existing revenues can be used immediately to service debt, thereby mitigating construction risk. Over a period of time, a utility can benefit from a steady flow of revenues from a diversified customer base and, if it integrates horizontally, from a diversified asset base. A more robust balance sheet can be created, allowing for internal finance as well as the use of capital markets to sell long term debt.

### **Asset sale**

The most dramatic and politically contentious form of privatisation is the outright sale of the utility's assets. To date this has been used in the 1989 sale of the English and Welsh water and sewage companies (WASCs), in two examples in the Czech Republic, in one in Belize (subsequently bought back) and in Chile up to 2000. While the assets are in private hands, the licence to operate them can be subject to renewal. In the case of the UK WASCs, a 30 year operating licence was awarded to each entity in 1989. It is evident that the assets carry no value unless one can operate them, while the cost of building a duplicate network would be prohibitive.

The problem with losing stakeholder participation in utility services is that it can erode the customers' sense of civic duty. During the 1976 drought, water consumption in England and Wales fell and standpipes and supplies brought in by tankers were accepted stoically. "Share a bath with a friend" suggested Dennis Howell, the then Minister for Drought. In contrast, during the 1995 drought, consumption rose amidst intense bitterness even at the possibility of water restrictions being imposed. They were not, but it was evident that an unexpectedly large element of the public's goodwill was unintentionally divested in 1989. In contrast, Aguas de Barcelona (Agbar) experienced a significant drop in consumption during the 1994-96 drought in Spain. Agbar is a private sector operator of municipally owned assets on a concession basis.

**Privatisations – Contract size and extent of privatisation compared**

	<b>O&amp;M</b>	<b>BOT</b>	<b>Full Concession</b>	<b>Asset Sale</b>
<b>Local/Single site</b>	USA	France	UK PFI & inset appointments	USA
<b>Town/Small city</b>	USA Kazakhstan	Germany Czech Towns	Germany	China USA
<b>City</b>	Mexico City	Atlanta Budapest	Manila Jakarta	India E&W WOCs
<b>River Basin/Region</b>	Greater Amman	Czech Regions	Argentina Italy	E&W WASCs Chile
<b>Country</b>	Chad (Phase 1)	Ghana (urban)	Chad (Phase 2)	N/A

**Characteristics of the main types of water and wastewater privatisation contracts**

Because of the elastic nature of definitions at present, the five forms of privatisation outlined below ought to be regarded as indicative. It is quite likely that a contract could offer elements from the differing categories. This can be a material concern in markets such as China, where the authorities are seeking foreign investment and management while seeking to impose the most restrictive terms that they can get accepted.

**Operations & management contract (O&M)**

<b>Time horizon</b>	2-5 years, up to 10	<b>Ownership</b>	Public
<b>Customer</b>	Government/Municipality	<b>Investment</b>	Public
<b>Cash flow profile</b>	Fixed fee for service	<b>Operation</b>	Public
<b>Construction risk</b>	None	<b>Tariff collection</b>	Public/Private
<b>Regulatory risk</b>	None		

O&M contracts allow the private and public sectors to get to know each other in a relatively low risk environment. They do not address problems of municipal inefficiency. The short term nature of the contract means that political stability can be poor and there is limited scope for the private sector to improve the performance of the utility. These contracts are often used to address specific areas of concern such as leakage management in Ho Chi Minh, Vietnam (Manila Water), and the outsourced operating of a water or wastewater treatment plant in the USA.

**Lease/affermarge contract**

<b>Time horizon</b>	10-15 years, up to 25	<b>Ownership</b>	Public
<b>Customer</b>	Retail Customer	<b>Investment</b>	Public
<b>Cash flow profile</b>	Subject to market risk	<b>Operation</b>	Private
<b>Construction risk</b>	None	<b>Tariff collection</b>	Private
<b>Regulatory risk</b>	Medium		

The municipality controls the assets, while the private sector controls their operation. Risk elements start emerging, with the private sector now dealing directly with the customers, and thus this can be the focus of discontent.

Affermage also refers to the 'French Model' being developed in France for water contracts since 1853 and for sewerage contracts since 1884 both by Générale des Eaux/Veolia Environnement with Lyonnaise des Eaux (Suez Environnement) gaining its first contract in 1880. The lease contract was initially developed outside France in France's former West African colonies such as for water and sewerage management in urban areas of Guinea (SEEG, SAUR (now Bouygues)/Veolia Environnement) and water services for Dakar and the other major urban areas of Senegal (DSE, SAUR (now Bouygues)). In fact, the first lease contract was in 1582 when Peter Morice's London Bridge pumping station was built and granted a 500 year lease by the Corporation of London. The London Bridge Water Works Company was taken over by the New River Company in 1822.

### Concession contracts

A typical concession award sees the splitting of the water and/or sewerage entity into service provision and asset owning entities. The concession holder will have a majority stake in the service provision entity's equity, along with management control, while the municipality in turn retains a controlling stake in the asset owning entity. The asset owning entity is responsible for the extant assets, with the new assets vested into this entity at the end of the contract. The concession developed in the 1880s with contracts such as in Barcelona, Spain (Aguas de Barcelona) and Istanbul Turkey (Générale des Eaux/Veolia Environnement). Since the 1990s, the concession has been the dominant form of private sector participation where new funding is being sought.

#### BOOT/BOT/BOO/TOT concession

There is some fluidity in defining DBO and BOT/BOO concessions. The World Bank defines DBO contracts as Greenfield contracts and BOT/BOO as concessions. However, FIDIC (International Federation of Consulting Engineers) defines the DBO in two forms: the 'Greenfield contract' which is a new build (design-build-operate) and a 'Brownfield contract' which involves taking over extant assets (operate-design-build).

<b>Time horizon</b>	10-30 years, up to 95	<b>Ownership</b>	Public
<b>Customer</b>	Government/Municipal	<b>Investment</b>	Private
<b>Cash flow profile</b>	Pay on completion	<b>Operation</b>	Private
<b>Construction risk</b>	High	<b>Tariff collection</b>	Public
<b>Regulatory risk</b>	Low		

#### Asset ownership under the four concession types

BOO	Build/Own/Operate	Concessionaire retains ownership of assets permanently
BOT	Build/Operate/Transfer	Hands over assets at end of concession, never having owned them
BOOT	Build/Own/Operate/Transfer	Hands over ownership of assets at end of concession
TOT	Transfer/Operate/Transfer	Assets handed to operator, taking ownership of assets during contract and returning them at end of concession

Concession contracts call for a full understanding of the financial risks involved with the project. These concession contracts can be regarded as the classic water privatisation model. Examples include: water treatment BOO for Riverland (Australia, United Utilities) and a sewage treatment works BOOT for Puerto Vallarta (Mexico, Cascas). The UK's Private Finance Initiative sewage treatment contracts are being awarded on a BOT basis.

In many cases, the concession award takes place with the splitting of the water and sewerage entity into a service provision entity and an asset owning entity. The concession winner gains control of at least a significant proportion of the service provision entity's equity, along with management control. The municipality in turn retains at least a controlling stake in the asset owning entity. The latter entity is subsequently responsible for the extant assets and new assets are vested into this entity at an agreed date.

#### DBO concession

Time horizon	20-30 years	Ownership	Public
Customer	Municipal/Retail	Investment	Private
Cash flow profile	Subject to market risk	Operation	Private
Construction risk	High	Tariff collection	Public / Private
Regulatory risk	Depends on local politics		

There are three varieties of DBO, design and build (DB) where the company designs and builds the facility and hands it over to the client, design, build and operate (DBO) where the company has an operating contract for an agreed period and finally, design, build, operate and finance (DBOF) where the company is responsible for financing the development of the assets.

**DB, DBO and DBOF compared**

<b>Risk allocation</b>	DB	DBO	DBOF
<b>Design and build</b>	PSP [1]	PSP	PSP
<b>Asset management</b>	Client	PSP	PSP
<b>Finance</b>	Client	Client	PSP

[1] In some cases, the client holds the design build risk.

Examples include the Santa Paula water recycling facility in California, USA (PERC Water), the wastewater treatment DBO for Cairo, Egypt (Suez Environnement) and the Wellington, New Zealand wastewater DBO (Veolia Environnement).

**Full utility concession**

<b>Time horizon</b>	20-30 years	<b>Ownership</b>	Public
<b>Customer</b>	Retail Customer	<b>Investment</b>	Private
<b>Cash flow profile</b>	Subject to market risk	<b>Operation</b>	Private
<b>Construction risk</b>	Low	<b>Tariff collection</b>	Private
<b>Regulatory risk</b>	High if politics volatile		

In this case, the private sector is allowed to get on with upgrading and operating the services, while developing new assets for handing over to the municipalities in the longer term. There have been mixed results to date, but some outstanding successes such as Metro Manila in the Philippines. Examples include: water and sewerage operations for Tallinn (Estonia, Tallinna Vesi) and water provision for Malacca (Malaysia).

**Asset sale/investor owned**

This is also known as a divestiture, asset sale, privatised (UK) and regulated utility (USA). This is the highest profile form of Private Sector Participation (PSP) with the private sector being responsible for all aspects of asset development, maintenance and service provision. Investor owned utilities are either Greenfield, where the utility develops the infrastructure to serve an area or Brownfield, where the extant assets are privatised.

<b>Time horizon</b>	In perpetuity	<b>Ownership</b>	Private
<b>Customer</b>	Retail Customer	<b>Investment</b>	Private
<b>Cash flow profile</b>	Subject to market risk	<b>Operation</b>	Private
<b>Construction risk</b>	Very low	<b>Tariff collection</b>	Private
<b>Regulatory risk</b>	Very high		

Problems of public perception and changes in regulatory priorities have meant that with the exception of Chile and two companies in the Czech Republic, the 'British model' (as asset sales have been dubbed), has not been copied abroad. In the USA and in one example in India, companies developed the assets in the first place.

Asset owning water utilities date back to Sir Hugh Myddleton starting the New River project for serving London in 1609, following an act of Parliament in 1606. 30 external investors joined the scheme in 1612, the project entered service in 1613 and was incorporated in 1619. The New River Company started paying dividends on its 'benefitt profit' [sic] from 1633. London County Council's Metropolitan Water Board nationalised the New River Water Company in 1904 and the company was subsequently privatised as Thames Water in 1989.

Greenfield investor owned water utilities are found in the USA (the regulated utilities), England & Wales (there were 284 private or statutory water supply companies in England & Wales in 1910, but this fell to the 29 'water only companies' by 1963) and Jamshedpur in India (Jusco). In the USA, expansion occurs through population growth and urban infill within an operating area and via the acquisition of small privately held or municipal operations which offer economies of scale when brought into the extant network, hence their being known as tuck-in acquisitions. The oldest of the extant regulated utilities in the USA is York Water founded in 1816.



Brownfield privatisations have been seen in England and Wales (the 1989 privatisation of the Water and Sewerage Companies (WASCs)), Chile (Santiago's Aguas Andinas and four of the 12 water regions), a number of cities in China and for a while, Belize. In the case of England & Wales' WASCs, a 30 year operating licence was awarded to each entity in 1989. However, the assets are owned outright by each company and as the cost of building a duplicate network would be prohibitive, any new licence holder would have to acquire the extant assets.

### The 'British', 'French' and 'German' models

The World Bank calls delegated water management through concession awards the 'French model.' The 'French model' is typically used to contrast it with the 'British Model' of asset sales. In fact, the real 'French Model' is the affermage lease as traditionally used in private sector contracts in France. To make matters more complex, there is a recent tendency to refer to the 'German Model' as well. This approach is where the operating assets are corporatised and a minority of the shares in the asset-holding company are held by one or more private sector companies, who in turn operate the concession. This is known as the 'Kooperationmodell' or the 'German Model'. A further variant of the 'German Model' is the 'Betreibermodell', where the private sector operator pays a fixed rate for the right to operate the water or sewerage services. The 'Kooperationmodell' probably best describes the majority of concession contracts.

### The models compared:

Name	Description	Examples
British Model	Asset sale	UK Water Plcs
French Model 1	Affermage lease	Suez/VE/SAUR (home)
French Model 2	Concession	Suez/VE/Bouygues (international)
German Model 1	Kooperationmodell	Berliner Wasser (VE/RWE)
German Model 2	Betreibermodell	Gelsenwasser

Generally speaking, the confusion caused by these names and the contracts that they refer to highlights the need for globally agreed definitions of contract types. They ought not to play a significant role outside discussions about privatisation approaches and philosophies.

### The popularity of each approach

The table below is based upon water and sewerage privatisation awards identified by the World Bank in developing economies during 1990 to 2009.

Private participation in water and sewerage in developing countries, by contract type, 1990–09:

Investment in projects by type (USDmillion)	
Concession	38,687
Divestiture	7,410
Greenfield project	13,072
Management & operate contract	1,395
<b>Total</b>	<b>60,564</b>

Investment in projects by subsector (USDmillion)			
Subsector	Segment	Projects	Investment
Treatment plant	Water & sewerage	12	292
	Water	136	10,382
	Sewage treatment	250	5,204
	Subsector Total	398	15,878
Utility	Sewerage collection	2	174
	Sewerage & treatment	10	2,751
	Water utility with sewerage	233	31,333
	Water utility only	70	10,428
	Subsector Total	315	44,687
<b>Total</b>		<b>713</b>	<b>60,564</b>

Source: World Bank, PPI database 2010

It is understood that the O&M entry in the above table includes lease contracts. While there are many of these contracts, the lack of private sector investment involved highlights their role as a partial privatisation that does not mobilise new sources of private sector investment. The experience to date, especially in developing economies, suggests that O&M and lease contracts are becoming a stepping stone towards concession awards at a later date or will continue to be used to address specific areas of concern, especially when linked with aid finance and loans from multilateral institutions. Greenfield operations are typically of a site specific nature, involving the construction of a water or sewage treatment facility, as seen in the UK's PFI. In recent years, a number of Greenfield contracts have been awarded in areas earmarked to become new housing or industrial zones. This approach has had some popularity in the Philippines. Divestitures have been seen to date in Chile. Given the confusion between contract types, it is perhaps not worthwhile to classify the concession contract types more specifically. Nevertheless, the concession approach, allied with the splitting of water and sewerage entities into operating and asset holding companies is becoming the favoured approach towards water privatisation in many countries.

### Water and power contracts compared

Water is too often seen as power's poor relative. It lacks the glamour of the major power contracts in terms of immediacy of delivery and the prospect of expensive new plant. Even so, its lower profile offers the prospect of more attractive returns.

### Power and water privatisation pros and cons compared:

Service sector	Water/Wastewater	Power
Political risk Politics	High political risk 'God's gift' ought to be free Essential for life & health	At the national level Essential for modern comforts A new resource needs to be paid for
Rate of return	High (15-25%) A few global and local players Lower degree of competition	Medium (10-15%) Many global and regional players Highly competitive market
Size of project (for first 5 years)	Small to medium USD50–400million capex	Medium to large USD250–1,100million capex
Technology import	Low part of overall cost Mainly local construction	The main cost component Imported or via joint ventures

It is interesting to note that some of the arguments against water, when compared with power, appeal to the sense of the irrational. These arguments are being eroded by the expediences noted in the sections above. One of the more common arguments against private sector involvement in water and sewerage services against power (and telecommunications) is that the former are more 'essential' or 'basic' than the latter, especially for poorer people. The manifest shortcomings of the status quo tend to be overlooked in such debates, along with the fact that water and sewerage programmes can largely be put into place with the judicious use of local manufacturing and technological capabilities. This is not to denigrate energy provision projects, but to highlight the importance of adequate water and sewerage services in economic development.

The bad news (except for project arrangers) is that the amount of legal and preparatory work for a water/sewerage and a power project is broadly similar. It is tempting, given the disparity in size between these projects to stint on such work. It is to be hoped that the examples included in this publication will demonstrate the paramount importance of due diligence in both bid preparation and contract negotiation, while treating each contract on its own.

### The politics of PSP and service extension

One of the most common political arguments against privatising water and sewerage services is that it will mean that water will be too costly for poorer people. In fact, pragmatic pricing policies based upon charging more per unit of water for households who use water for non-essential purposes has made private water provision both affordable and viable. Cross-subsidies and social provisioning lie at the core of service extension. Appropriate and safe water and sanitation services can be provided for 2-5% of household income. Questions about affordability and private sector involvement in developing economies tend to ignore the fact that under the current arrangements, it is the poorer people living in urban areas who have to pay over the odds to water vendors for supplies of distinctly dubious quality. People are willing to pay an economic price for water services if it comes with guarantees of quality and availability.

### Comparing the cost of water supplied from household connections and informal vendors

Dar es Salaam, 1998-99	Shillings/L	USD/m <sup>3</sup>
Own connection	0.27	0.34
Neighbour's tap/water kiosk	1.00	1.25
Pushcart water vendor	3.50 – 10.00	4.38 – 12.50
Tanker truck	6.00 – 8.00	7.50 – 10.00

Source: IIED, 2006

It is the absence of piped water that costs more both in financial and public health terms. Popular support exists for adequate supplies of water and improved public health at an affordable rate. Opposition is most visible amongst the better off households who oppose paying an economic price for piped water supplies for gardens, swimming pools and other non-essential household uses. Indeed, with the lack of metering or progressive tariff structures, they are subsidised by poorer households. The fact that these are also the people with the most political influence means that the political picture is often distorted.

### The practicalities of delivering service extension

What can the private sector offer to the unserved urban poor? For multilateral institutions, governments, municipalities and the private sector, when seeking to use PSP in service extension, three questions need to be answered:

- Can these projects be delivered more cheaply?
- Can new sources of finance be mobilised?
- Can extant assets be operated more efficiently?

These questions apply to all water and sewerage PSP projects, but are particularly pertinent here. UU's water and sewerage contract in Manila (Philippines) involved a price cut of 65% in 1997 and is performing satisfactorily in terms of finances and service delivery (see company entry). Finance has become problematic, with the project finance market currently running at perhaps 25% of its peak capacity seen in the late 1990s. The private sector has two real strengths; mobilising extant assets to optimise their efficiency and developing new assets so that they provide a given level of performance at the lowest price.

The challenges in arranging finance stems from poor risk management and concerns about foreign currency exposure. A mix of foreign and international debt can help to ameliorate this, as is being used in Malaysia and China. Otherwise, it remains essential for multilateral institutions, development banks, politicians and international aid agencies to create the right conditions to encourage these capital flows. One of the most important issues here is deciding if a concession is to be supported by outright grants designed to lower the cost of service extension.

At the same time, cost recovery in the medium to longer term is essential. The key here has to be getting the cost of service provision down to affordable levels by using an appropriate and upgradeable infrastructure.

Privatising water and sewerage services can reduce capital spending by 20-45% and through economies of scale and efficiency measures, service provision costs by 10-25%. Capital spending

costs are reduced by shifting construction work away from technology for its own sake to a performance-related basis, along with ordering through the contract holder's parent company. Cost reductions are driven by competitive tendering whereby the competing bidders are motivated to find the most cost effective ways of delivering a set of service criteria for a satisfactory rate of return. This approach creates incentives for the bidders to identify areas where they can drive operating costs down while at the same time improving service quality. Often the two will be linked. People are more willing to pay when they receive a reliable service with demonstrable improvements in water quality. Reducing distribution losses allows more water to be provided to the customer without needing to mobilise new resources. Progressive tariff policies, allied with effective billing and the removal of illegal connections, drive down the overall cost of water provision for the less well off.

### The private sector's role

In 2000, Suez served 46million people in developing economies and 8.5million people classified as among the urban poor. VE, UU, Bouygues and RWE, among others, also provided services to the urban poor where there were none prior to privatisation. The 2008 edition of this yearbook provided a number of case studies.

A study in 2009 by the World Bank found that despite a number of concessions not being able to meet their contractual targets, in 36 major water PSPs 24million people benefitted from new connections. In some cases this was due to the linkage to grant funding, most notably in Senegal, or the use of tax revenues as in Guayaquil (Ecuador). Indeed, failings in service extension are often linked to a dependence on internal cash generation which may not be sufficient (as seen in Argentina and Bolivia) to meet the anticipated targets.

	<b>New connections</b>	<b>People connected</b>
Concessions (n=30)	2,500,000	17,200,000
Leases (n=6)	600,000	7,500,000
Total (n=36)	3,100,000	24,700,000

Improvement in access to water and 24-hour service has been the norm.

*Source: The World Bank (2009) Public-Private Partnerships for Urban Water Utilities: A Review of Experiences in Developing Countries, World Bank, Washington DC, USA*

The emphasis lies in developing a new infrastructure that meets current needs (piped water and sewerage) that can be upgraded as and when higher standards of service delivery are needed. By mobilising local labour at street level, the costs of developing these services can be greatly reduced. Finally, PSP has much to offer in making sure that the greatest benefits can be delivered for a minimal cost.

### Dealing with corruption

There have been several highly publicised cases of corporate malpractice relating to the World Bank supported Lesotho Highlands Water Project. While no companies directly involved in the water and wastewater sector have been included in the World Bank's listing of proscribed entities, the perception of corporate corruption in the procurement of private sector participation in the sector has been relentlessly exploited by the various anti-privatisation bodies.

At the same time, the private sector's response to these allegations has been reactive in nature. A number of wide ranging statements, commitments and charters have been launched, but these have tended to avoid directly addressing the complaints raised by the various anti-privatisation lobbies. As is the case with most research on the performance of Public Sector Participation ('PSP'), investigations into corruption have chiefly been carried out by academics attached to anti-privatisation lobbies and a range of NGOs, principally in North America. This gives the anti-privatisation lobbies a great advantage when communicating ideas to the media. In consequence, anti-PSP polemics are effectively unchallenged.

In terms of perception, it is fair to say that the international media, politicians and NGO lobbies see the private sector in general and privatisation in particular as causing corrupt practices to take place in the provision of water and sewerage services. In reality, corruption tends to be endemic under public ownership and operation. This is because water and wastewater per se are exposed to corrupt practises at a number of operational levels due to the nature of the services they operate. Such

practices get minimal exposure at anything beyond the local level, as it is accepted modus operandi for providing these services.

### **The Camdessus Report's Recommendations**

'Corruption' is mentioned 11 times and 'corrupt' a further two times in the Camdessus Report on "Financing Water for All" (CR). CR notes that corruption can arise among public and private, local and international participants in the water sector. The impact of independent NGOs such as Transparency International has been limited by the reluctance of governments, multilateral institutions and companies to adopt their recommendations on a consistent basis. CR's specific recommendations with regards to water and corruption can be summarised as:

- capacity building is to be encouraged;
- water policies need to be defined and implemented;
- leadership ought to be of a high calibre;
- the multiplicity of opportunities ought to encourage healthy competition;
- NGOs and stakeholders should be encouraged to expose corrupt practice;
- companies are urged to co-operate to develop methods for promoting ethical behaviour;
- the public sector needs to develop standards that place their behaviour above reproach;
- private participation transactions should be made more transparent; and
- develop best practice and model clauses in the legal agreements for private participation.

Its recommendations are well meaning and hard to dispute. Indeed, they are of such a broad and generous nature that at first it appears churlish to query them. They do, however, need to be implemented and to take effect by the CR's proposed 2006 reporting deadline.

The private sector needs to acknowledge its structural failings in communicating that there are challenges to PSP playing a leading role in developed economies while being a material part of the process of providing universal access to water and sanitation services in urban areas. There is an urgent need for the private sector to sponsor independent research so that a process of engagement can begin.

### **Define corruption**

The cost of corruption can only be understood when stakeholders know where it happens and how it affects people's lives. So, before concerns about corruption can be addressed, we need a commonly accepted set of definitions as to what corruption is and is not. There is also a need to differentiate between what might be called 'actual' or fiscal corruption and 'moral' corruption, where bidders abuse the tender process by submitting a loss-leading bid in anticipation of a successful re-negotiation procedure afterwards.

#### What is it?

Country – Bribes demanded at the government/ministerial level

Municipal – Bribes for contracts, bribes for services or for avoiding billing/penalties

Corporate – Companies bribing in order to gain contracts

#### When does it take place?

Water allocation and billing – Avoidance of bills, setting up illegal connections, getting access, etc

Regulation – Avoidance of penalties over illegal abstraction/connection, discharges, etc

Procurement and contracting – Bribes for the award of goods/service provision contracts

During the privatisation process – Bribing to influence the tendering/award process

#### Why is it wrong?

It needs to be spelt out that corruption hampers service provision, affordability and the efficiency of service provision, along with public health and environmental implications. For politicians, companies and municipalities this does mean acknowledging that corruption occurs both in the public and private sectors and that it is measurable.

While 'moral' corruption may be seen by some as 'part of the game', it has consistently undermined confidence in the PSP contract award process and has unduly politicised the re-negotiation process.

Transparency International's Business Perception Index (BPI), how businesses from varying countries are seen when dealing in developing economies - surveys in 1999 and 2002) and annual Corruption

Indexes (a synthesis of national surveys on the perception of corruption within each country) are a useful starting point. It is of interest to note in the 2002 BPI survey that public works/construction scored the lowest of all categories given, with 46% of all recipients stating that this sector was seen as likely to offer the biggest bribes.

### **Consistent bidding and financing criteria**

Bid criteria need to be developed that are applicable in developed and developing economies. The greater the replicability of contract types and procedures, the less scope there is for abuse to take place as all parties are increasingly familiar with the system, especially those involved in overseeing the probity of the bidding process. This also reduces the cost of independent scrutiny and would allow for such scrutiny to take place on a regional basis.

Talks have been going on since at least 1998 about developing commonly accepted definitions/templates for contract types, so that all interested parties know what is going on at each point in the contract development and negotiation process. This process needs to be expedited with the aim of developing legally binding (and therefore fungible or supra-national) contract definitions that could be brought into play by the World Bank and regional banks ('regional' refers to groupings of countries).

### **A re-evaluation of renegotiation attitudes and procedures**

Re-negotiation of contracts is seen by stakeholders and NGOs as a cynical attempt to maximise profits once the contract award process is out of the way. There is no doubt that water contracts in developing economies are more volatile than most. Between 1990 and 2001, 3.5% of World Bank funded water contracts were cancelled against 1.9% for infrastructure projects in general. In value terms the difference is even more marked: 11.3% for water versus 3.2% for infrastructure projects overall. During the same time 71% of 89 World Bank supported concessions were renegotiated, 5% by the companies and 66% by the governments. While almost all contracts were subject to a bidding process, regulation was generally notable by its absence.

A formal re-negotiation process needs to be built into contracts, based upon agreed-on performance and price criteria. Such a process can work both ways, as when circumstances swing favourably in the concession's direction (some currencies appreciate against the USD over time), this ought to release a mechanism to compensate for previous adjustments where appropriate.

### **Windows of transparency (1): Regularising bidding and negotiation procedures**

<b>Contract Stage</b>	<b>Information placed in the public domain</b>
Call for tender	Tender documents & bid criteria
Bids received	Ballpark figures (non-company specific)
Final bids received	Ballpark figures (more specific)
Award of contract	Relate award to bid criteria
Announcement of terms	Explain any changes to original bid criteria
Announce regulatory process	Criteria and current performance data
Contract commences	Performance prior to PSP
Quarterly/half year key criteria	Critical issues highlighted
Annual review	Regulatory returns & independent reviewing
Outstanding issues highlighted	Performance against targets, new targets

In each case, the idea is to release information to interested parties in an open, consistent and controllable manner. Once final bids are in, competitive secrecy is of historic importance. If pre-award negotiations need to take place, stakeholders need to have confidence in this process. The entire process can be extended into making clear to all parties the criteria that are to be material when bringing the re-negotiation process into play.

### **Communicating best practice**

This calls for a holistic approach to countering corruption. The regulatory climate in England and Wales may be onerous, but no stakeholder could reasonably complain about being deprived of data. Comparative data of increasing accuracy (and methodological rigour) at all operational levels not only creates an unrelenting drive towards 'ideal' operational efficiency, it also makes it increasingly hard for financial malpractice to take place.

**Windows of transparency (2): Eliminating malpractice, rewarding efficiency**National/regional database for:

Best practice – Specific examples of utility performance and their replicability

Benchmarking – Developing comparative criteria (avoiding Ofwat's cult of the comparator!)

Operational efficiency – Knowing what a system can deliver under given circumstances

Global database for (PPP weighted, as appropriate):

Cost of technology – Ballpark figures for widely used technology

Cost of construction – What it costs to build/install units of infrastructure

Cost of professional services – General range of expected costs

The latter will doubtless prove particularly contentious. In reality, this refers to hourly rates and so on, since flexibility and experience is essential in professional services, especially when dealing with more inexperienced clients.

**Engaging NGOs and stakeholders**

NGOs (Non Governmental Organisations) need to be made part of the reporting process. Attacking corruption is in their interest and as it is also in the interest of reputable PSP players, they have little to fear from each other. One of the reasons for faltering levels of ODA (Overseas Development Assistance) in recent years, especially in water and sanitation, is the feeling that money is not being spent where it ought to go.

Giving NGOs access to information through the mechanisms outlined above will allow confidence in the process to be built. They also have a role to play in whistleblowing at all levels of malpractice. It is essential that the private sector have a formal set of procedures to protect people within their companies who wish to expose corruption.

Stakeholders, especially customers also need to be formally involved within this process. Therefore a reporting mechanism needs to be set up for reporting their concerns about corruption (and other concerns about service delivery). The NGO community has a role to play here, along with liaising with the regulators to ensure that such information is channelled in a controlled manner.

**Regulators and regulation**

Independent regulators are essential. As the UK experience has shown, regulation is not cheap (Ofwat is arguably an industry in itself) and it takes time for a regulator to know its market. It places a great emphasis on efficiency and meeting targets, both of which minimise the scope for corruption. In Scotland, the Water Commissioner is adopting a similar approach with the state-held Scottish Water, demonstrating that regulation and reporting can take place within the public sector. This experience has highlighted why municipal entities need to be exposed to independent regulation.

Regulation of a suitably robust nature (and allied reporting systems) needs to be in place before the privatisation process starts. Perhaps the initiation of such schemes ought to mark the effective beginning of the privatisation process. These reporting systems need to be developed on a tripartite basis (economic regulation, water quality and service delivery and environmental protection and resource management), ensuring that the various reporting functions operate independently of each other, so as not to compromise their separate interests. To address the cost of regulation, the World Bank, regional development banks and other interested parties should support the setting up of regional regulators along with supporting capacity building for analytical and comparative work. These regulators would be responsible for developing comparative data on a regional basis and assisting the implementation of a national regulator for each country where PSP is about to take place.

**Opening windows of transparency**

If confidence in the bidding process is undermined by its perceived opacity, then windows of transparency ought to be opened at suitable stages in the process as outlined in this section, allowing stakeholder scrutiny and building external confidence in the process.

Too much is said about commercial secrecy. As CR notes, healthy competition is the scourge of corruption. Free economies deserve freedom of disclosure and the right to make a free choice based on information which stakeholders and NGOs can also have confidence in. A number of mechanisms

exist which can be used to ensure the generation of such information is part of the privatisation process. For example, certification with the ISO 9000 (total quality management) and ISO 14000 (environmental management systems) standards, externally audited by an international agency ought to be required within a given timeframe.

Externally recognised and monitored operational quality criteria have a significant role to play in the capacity and confidence building process. This means that the 1998 Convention on Combating Bribery in International Business Transactions (OECD Convention) needs to be an integral part of each process, placing pressure upon countries that have yet to adopt it. The World Bank's 1996 Guidelines for Procurement under IBRD Loans and IDA Credits remain valid and need to be seen as an effective sanction against potential transgressors.

Concern has also been expressed about perceived information asymmetries that favour private sector companies with a wide experience of market conditions and strategies. This can lead stakeholders to regard the bidding (and re-negotiation) process with scepticism. These concerns are best addressed through a capacity building programme designed to ensure that local and national interests are suitably addressed, while a formal disclosure system before, during and after the privatisation programme allows stakeholders to have the information they need to be able to constructively engage with the service provider, the private sector and the regulators.

Many of the mechanisms called for are necessary for building up competitive domestic markets along with the ability to compete effectively on a regional basis. Therefore the capacity building exercise will benefit the local private sector as well as the regulators and NGOs.

The need for independent and unbiased analysis of the role PSP can play in assisting the aim of universal service provision, as well as the challenges facing the private sector remains paramount. The absence of such research undermined the credibility of the Kyoto process and must not continue to be allowed to undermine the credibility of the private sector as a whole.

#### **Transparency International's 'Corruption in the Water Sector' report**

Transparency International's 2008 Global Corruption Report concentrated on corruption in the water sector. According to the report, the scale of costs taken up by corruption is 10-30%, presumably being higher in the more corrupt economies. In contrast, the headroom in England and Wales under Ofwat, for example, must be quite small because of comparative data and the incentives for performance. By its nature, corruption is hard to quantify, but indicators of its scale and extent can be found.

#### **Transparency International - Corruption increases the cost of procurement**

A survey in South Asia (Davies J (2004) Corruption in Public Service Delivery: Experiences from South Asia's Water and Sanitation Sector, World Development, 32/1) found that bribes paid by contractors to municipalities to secure contracts accounted for 1-6% of the contract's value, with bribes for poor work and missing equipment compounding this up to 11%. Cartels inflated the cost of materials and services provided by 15-20% and poor quality work and goods impacts the infrastructure's operating life by up to 20%. The overall impact of these practices was estimated to raise the price of providing infrastructure by 25-45%.

Complex projects with layers of management and officials involved create more opportunities for corruption, especially when above the municipal level. The lack of accountability when using public funds (especially where cost recovery is not fully in place) makes it easier for this to occur.

Corruption is also an issue in developed economies and PSP without a suitable regulatory framework creates a new area for corruption. Collusion has been seen amongst contractors (Japan) and manufacturers (Sweden and Australia) while a number of cases are highlighted where PSP bids involved incentives ranging from hospitality to a bribe worth 2% of the contract value.

#### **Transparency International - Corruption in practice**

Labourers in India are forced to pay bribes to secure jobs and work not being carried out to contract specification caused financial 'leakages' of 30-45%. 40% of municipal water customers in India regularly paid small bribes to falsify meter readings, 33% to speed up repair work and 12% to expedite new connections.



In China, 10% of government spending is lost through corruption with just 50% of spending on environmental projects in 2001-05 going on the intended work.

People living in informal settlements typically depend on water vendors who charge excessive prices because of their lack of formal property entitlements, political influence and the money needed to bribe formal service providers. In addition, a captive business is attractive to water vendors. In Bangladesh and Ecuador, water vendors bribe local officials to ensure water service extension is denied. In cities with water shortages (for example, Delhi, Nairobi and Algiers) bribes are used for preferential access, by the rich and the water vendors.

### **Transparency International - Counteracting corruption**

Prior to 2005, pipe manufacturers in Colombia had to pay bribes worth an average of 12% of the contract value in order to gain their contracts. There was a material drop in pipe prices from 2005 when the association of pipe manufacturers entered into an anti-corruption agreement with Transparency International.

An integrity pact developed by Transparency International resulted in costs for the Greater Karachi Water Supply Scheme's Phase V Stage II being 18% below initial expectations.

Water integrity national surveys (WINS) can be developed for national anti-corruption plans and implemented at all applicable levels. This is being implemented, for example, in Bosnia-Herzegovina. Water & wastewater need autonomy and separate, audited accounts (Cambodia, Brazil and Senegal) and in 20 cities in Africa and Asia, operating performance has been found to be linked with operational autonomy. However, a survey of 59 countries found that in nearly half of all cases, audited information was withheld for at least two years and in ten cases was not even made available to legislators.

Performance monitoring allows for benchmarking between utilities and reduces the scope for anomalous practices. The UN's International Network for Benchmarking Water Utilities (IBNET), used in other parts of the report) provides comparative data, as does GWI's annual tariff survey (GWI (2009) Tariff survey, September 2009) and Ofwat's annual international performance surveys.

Other points:

- Cost recovery reduces the scope for hidden subsidies and payments.
- Independent regulation is needed (seen in less than 25% of developing countries by 2004) along with avenues for consultation and complaint by user communities.
- Direct payment of bills to offices rather than agents removes a layer of corruption.
- Pro-poor subsidies need to be directed to the poorest 10-20% of the population, rather than the richest as seen in Tanzania, India and Nepal

*Source: Transparency International (2008) Global Corruption Report 2008: Corruption in the Water Sector, CUP, Cambridge, United Kingdom*

**APPENDIX 3:**  
**THE PRIVATE SECTOR AND THE MILLENNIUM DEVELOPMENT GOALS**

## APPENDIX 3: THE PRIVATE SECTOR AND THE MILLENNIUM DEVELOPMENT GOALS

*"In order to move forward on this contentious issue, a multi-stakeholder review should be undertaken. We believe that it is only through such a review (similar to the World Commission on Dams) that the final, authoritative word can be made on whether PSP benefits the poor. We also believe in the necessity of building the capacity of civil society actors to influence privatisation processes and to hold governments and the private sector to account. This needs to start with improving their knowledge and understanding of the issues surrounding failing water services, and enabling civil society groups around the world to learn from each other's experiences of intervention in privatisation processes."*

Source: *New Rules, New Roles: Does PSP benefit the poor? Tearfund, 2003*

This Appendix contains some personal thoughts about issues affecting the private sector and the need for it to play an appropriate role in assisting extension of access to safe water and sanitation services over the next two decades.

### 2000-02: The World Water Vision

The World Water Vision (WWV) for 2025 was launched at the Second World Water Forum at The Hague in March 2000. It was designed to represent a multilateral and multinational consensus for gaining universal access to water and sanitation by 2025. In September 2000, 189 United Nations member states adopted the MDGs, including to 'Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.' The Second Earth Summit in Johannesburg (2002) ratified the MDG targets and as with The Hague's World Water Vision, emphasised the role of the private sector in providing financial and management resources.

According to figures developed by the World Bank in the late 1990s (for basic services) and various sources in the EU and the USA (enhanced services), the funding needs identified for providing basic (driven by public health concerns) or enhanced (driven by environmental standards) water and sanitation services over the coming decade are as follows:

USDbillion required	Basic services	Enhanced services
Asia	220-300	10-30
Latin America	200-250	0
Africa	80-100	0
Middle East	45-65	0
Eastern Europe	30-50	0-20
N America & W Europe	25-35	300-450
<b>Total</b>	<b>600-800</b>	<b>310-500</b>

Prior to the WWV, traditional assumptions for private sector participation (World Bank) expected to see the private sector contribute 5-15% of funding needs in developing economies. This is equivalent to USD4-12billion pa. The increase in forecast capex needs from USD30billion to USD80+billion pa has been accompanied by an increase in the anticipated scope for private sector finance to USD10-20billion pa. Such a financial commitment will not take place unless adequate investment conditions exist and these require private sector participation in the management of these services.

### WWV 2025: Water, sewerage and sewage treatment spending, 1995 to 2025

#### The need for basic service provision:

Developing countries	2000	2025
Population (million)	4,760	6,530
Lacking safe water (million)	1,300	330
Lacking sanitation (million)	2,600	330
Forecast Investment (USDbillion pa)	70-80	180

**Water and sewerage spending, 1995 to 2025:**

<b>USDbillion pa</b>	<b>1995</b>	<b>2000-25</b>
Drinking water	17	17
Sanitation	1.5-2.5	15
Wastewater treatment	11.5	50-60
<b>Total</b>	<b>30</b>	<b>82-92</b>

Source: Prynne P & Sunman H, *Getting the water to where it is needed and getting the tariff right*. FT Energy Conference, Dublin 11-2000.

The WWV assumes that USD2,050-2,300billion in total needs to be invested over a 25-year period. Assuming that all contracts will be debt financed (where PSP is being used, it will in fact be 70-80% debt-financed), and on the basis of 7% for servicing the cost of assets, 10% for the operation of these assets and an overall return of 5% on assets for debt repayment and returns for the private sector where appropriate, this points to costs of 22% on the total investment. This could point to a market with USD450-500billion per annum in the developing economies. Assuming in reality that USD40-50billion each year will be spent (factoring in the private sector's ability to bring the cost of capex down by 15-25%), this still points to a market worth USD220-275billion pa by 2025. There will be 7.7billion people in developing economies by 2025, with approximately 2.9billion living in urban areas. This equates to USD75-95 per person per annum, which is a fairly demanding figure for these economies. The problem is that the WWV figures assume that USD500 per capita needs to be spent 'conservatively' to connect all people to water and sewerage services in urban and rural areas.

**Estimates for current and extra annual spending need for universal service provision:**

<b>USDbillion</b>	<b>Vision 21</b>		<b>Briscoe</b>		<b>GWPFA</b>	
	<b>2000</b>	<b>Future</b>	<b>2000</b>	<b>Future</b>	<b>2000</b>	<b>Future</b>
Water	N/A	N/A	N/A	N/A	13	13
Sanitation	N/A	N/A	N/A	N/A	1	17
<b>Total water &amp; sanitation</b>	<b>N/A</b>	<b>75</b>	<b>25</b>	<b>N/A</b>	<b>14</b>	<b>34</b>
Municipal wastewater	N/A	N/A	N/A	N/A	0	70
Industrial wastewater	N/A	N/A	N/A	N/A	7	30
<b>Total wastewater</b>	<b>N/A</b>	<b>75</b>	<b>N/A</b>	<b>N/A</b>	<b>21</b>	<b>100</b>
<b>Total</b>	<b>N/A</b>	<b>150</b>	<b>N/A</b>	<b>N/A</b>	<b>35</b>	<b>134</b>

Sources

:

Vision 21: World Water Council 2002

Briscoe, John: International Journal of Water Resources Development, 1999

GWPFA: Global Water Partnership, Towards Water Security: A Framework for Action, 2000

The UN Millennium Project Task Force on Water & Sanitation 2005's report gives a round-up of general estimates for spending needs (USDbillion pa):

<b>Source</b>	<b>Year</b>	<b>Total</b>	<b>Water</b>	<b>Sanitation</b>
Global Water Partnership	2000	30.0	13.0	17.0
Vision 21, WSSCC	2000	8.9	5.2	3.7
WHO / UNICEF	2000	N/A	3.1	12.6
World Bank	2002	29.0	13.0	16.0
Camdessus Report [1]	2003	40.0	23.0	17.0
Smets [2]	2003	32.0	N/A	N/A
Evans & Hutton	2004	13.7	2.1	11.6
UN MDG Task Force	2004	6.7	4.5	2.2

## Notes

[1] 32 more for full WATSAN

[2] 20 for new facilities, 12 for rehabilitation

The variable nature of these forecasts is a real cause for concern and more serious analysis of these costs, rather than extrapolations of other people's figures are badly needed. The expression 'back of envelope calculation' was invoked in one review of these figures and it is not an unfair one. This also is reflected in expectations about the cost of providing new sanitation and sewage treatment services.

To halve the proportion of people without a safe water supply by 2015, an estimated USD2billion to USD23billion per year would be required, depending on the approach taken in each particular case. Based on the provision of basic sanitation for the poor, USD2billion to USD17billion would be needed per year. The sheer range of these estimates suggests that they are not estimating the same outcomes. Currently total Overseas Development Assistance (ODA), runs at USD53billion a year. The question here is: how much ODA will ever be directed at 'unglamorous' sectors such as water and sewerage?

**2003: Kyoto's road to nowhere?**

There were 406 sessions at the World Water Forum in 2003. Of these, 12 sessions covered finance, along with 15 on the private sector and six sessions devoted to opposing private finance. There was one session on industry and water. It was no great surprise to find that no regional or national targets for water and sanitation coverage were considered.

This sums up the piecemeal nature of 2003. In June 2003, the European Parliament sought to create a European Water Fund of EUR1billion from both public and private sources to fund water supply and purification in developing countries. Paul Lannoye MEP, the European Parliament's Rapporteur on water management saw the proposed sum as inadequate and suggested that a tax of EUR0.005 on every bottle of mineral water sold in Europe.

In May 2003, The Group of Eight's (G8) "Water Action Plan" called for efforts to secure more safe drinking water but declined to provide funds. The G8 offered to support countries that prioritised safe drinking water. The G8 added they would promote public-private partnerships (PPPs), where appropriate. There has been no official development of this plan since this date.

What aid there is does not appear to be going where it is needed most. A survey carried out for the OECD in 2002 (OECD (2003) Aid activities in the water sector 1997-2002, OECD Paris, France) found that 12% of all aid going to the water sector that year went to countries where less than 60% of the population had access to safe water. Annual aid going into water is some USD3billion, with another USD1.5billion in loans. The largest donor is Japan, which gives 33% of total water aid and has an extended loan programme to complement the funding.

**2004-05: Meeting these goals – already a cause for concern**

In 2004, the first surveys commissioned by the UN towards these goals were published and they indicate that there is already slippage from the intended targets. This is especially noticeable in Africa and South Asia.

**People in urban areas who need to gain access to safe water or sanitation services by 2015:**

Million people	Water	Sanitation
Eastern Asia & Pacific	290	330
Sub-Saharan Africa	175	178
South Asia	243	263
South-Eastern Asia	115	208
Latin America & Caribbean	121	132
Former Soviet Union	27	24
<b>Total</b>	<b>961</b>	<b>1,032</b>

Source: UN Millennium Project Task Force on Water & Sanitation, Interim Report, 2005

**2005: The UN 'Water for Life' decade and WWF4, Mexico 2006**

The United Nations International Decade for Action, "Water for Life", 2005-2015 was launched at World Water Day, 22 March 2005. The Decade for Action is designed to highlight the disparity between progress to date and the work needed to attain the water and sanitation MDGs as highlighted in the 2004 study by UNICEF and the WHO. Again, the UN explicitly recognises the contribution needed from the private sector to attain these goals.

**The Fourth World Water Forum: Smaller visions, greater realisations**

The 2006 World Water Forum in Mexico City represented progress of sorts. When Jose Angel Gurria the former Mexican Finance Minister and Director General designate of the OECD presented his 'Task Force on Financing Water for All' report, the session was briefly disrupted by hostile chanting. In contrast, Michel Camdessus' session at Kyoto three years earlier ended in chaos after eight minutes as a room packed with pre-warned journalists witnessed a stage invasion worthy of a British football match in its 1980s hooligan heyday. Certainly, security was tighter, but perhaps expectations on all sides are lower as reflected by WWF4's theme of 'local actions for a global challenge'.

Looking back, the Camdessus panel realised that they have 'not been good political communicators' not least because nobody asked them to be this in the first place. They did however manage to create a conceptual framework for developing financial strategies and policies, which the Gurria Task Force has sought to sell to the developed countries through proposals based on realisable objectives. The emphasis on preparing a broad range of case studies here is a good start as they demonstrate what can be achieved through sub-sovereign debt initiatives.

This also means that whatever the purists say, water services need to be able to cover their operating costs and to finance debt. The 1992 Dublin Statement recognising water as an economic good and its universal access as a human right holds good today. It also recognises that private finance supporting municipal water projects is a quite separate issue from the private sector owning or operating municipal water assets.

The various presentations in the run up to, during and follow ups from WWF4 demonstrate that for developing countries funding and the capacity needed to put this to effective use remains a critical issue.

**The Fifth World Water Forum: Information flows**

The WWF5 was held in Istanbul, Turkey in March 2009. Not only did the proceedings go ahead in an orderly manner, but in total, there were at least 25 presentations of a 'financial' nature including half a dozen or so which were explicitly concerned with the role PSP can play. The only antagonism was at the end when there was a dispute about how 'affordability' ought to be defined in the final communiqué. It was remarked afterwards that the overall message was not a clear one.

Even so, what remains disappointing is the lack of public corporate engagement has been generally noticeable, perhaps reflecting changed priorities in recent years.

**The Sixth World Water Forum: Don't fail in Marseille**

2010 marks the start of the formal process for preparing the fourth World Water Assessment (WWA4) and the sixth World Water Forum in Marseille, both to be launched in March 2012. Both need some clear themes and messages on water finance, especially when it comes to putting across messages that policy makers can easily understand. This March the OECD held a workshop to highlight research needs and priorities. Compared with such meetings a few years ago, the quality of data available has improved markedly and the debate has moved from ideology to applicability.

Whatever we do today, the outcomes of the Water & Sanitation Millennium Development Goals in 2015 are, broadly speaking, already determined. Rather than being ends in themselves, they ought to become a platform towards universal sustainable water provision and management.

**Official Development Assistance remains a subject for dry humour**

Official Development Assistance (ODA) from the OECD nations via its Development Assistance Committee (DAC) to less developed economies has fallen as a percentage of the DAC members' Gross National Income from 0.33% in 1992 to 0.22% by 1997, partially recovering to 0.26% by 2004.

By 2010, it is anticipated to rise to 0.36%. The DAC anticipate ODA rising to USD130billion by 2010 but no decisions have been made as to the relative priority of water and sewerage projects within this.

### All Water & sewerage DAC (USDmillion, global 1998-07)

C = commitment to providing the funding

D = funding is disbursed by the donor

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Resource	C	127	34	21	181	98	44	152	89	141	67
Protection	D	N/A	N/A	N/A	N/A	12	41	49	77	45	66
Resource	C	222	285	268	375	566	426	1,393	1,023	1,991	914
Admin	D	N/A	N/A	N/A	N/A	194	281	317	650	597	491
Large	C	1,450	1,381	2,216	1,707	803	1,723	2,230	3,009	2,795	3,937
Watsan	D	N/A	N/A	N/A	N/A	620	636	911	1,535	1,654	1,401
Basic	C	644	365	982	560	516	840	822	864	1,030	1,000
Watsan	D	N/A	N/A	N/A	N/A	182	418	469	775	705	964
<b>Total</b>	<b>C</b>	<b>2,443</b>	<b>2,064</b>	<b>3,487</b>	<b>2,824</b>	<b>1,984</b>	<b>3,033</b>	<b>4,597</b>	<b>4,986</b>	<b>5,957</b>	<b>5,918</b>
<b>DAC</b>	<b>D</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>1,009</b>	<b>1,376</b>	<b>1,747</b>	<b>3,036</b>	<b>3,001</b>	<b>2,921</b>

Source: OECD DAC Database

ODA commitments for large systems water and sanitation projects peaked at USD2.1billion (2003 dollars, five-year moving average) in 1998 before falling to USD1.6billion in 2000, before recovering to USD1.8billion in 2002. Although there was a significant increase in 2004, the overall increase since 1990 has not matched population growth in the less developed economies. Overall ODA was USD91billion in 2004, up from a 15-year low of USD64billion in 1997. The DAC anticipate ODA rising to USD130billion by 2010 but no decisions have been made as to the relative priority of water and sewerage projects within this (Source: World Water Council (2006) Official Development Assistance for Water from 1990 to 2004, WWC, Geneva).

### Africa remains the greatest challenge

In real terms, ODA for water projects in Africa since 1992 have varied between USD900million and USD1,100million per year, with the only increase during that period seen amongst the Least Developed Countries. Although overall global ODA has increased since 2000, and is promised to rise further by 2010, no promises have been made as far as water funding goes.

There is a depressing tendency for this to get misappropriated, meaning even less is done and donors are discouraged. Only anecdotal data is available, but Transparency International believes that anything up to 60% of operations and management costs can be absorbed by corrupt practices where water is managed by unaccountable municipal entities. Such a mighty degree of malpractice depends on a culture of compliant collusion, where funding flows are not subject to scrutiny. This is found where a utility does not need to fund itself through recovering its own costs, but depends on cross subsidies which are unrelated to service delivery.

There is an increasing reluctance just to disburse ODA funding at projects in the hope that they will look after themselves. At the same time, conditions are generally pretty unattractive for private finance. Hopes that the structured finance concept can deliver in the region are not well founded. Currently, only Cote d'Ivoire, Senegal and parts of Uganda have effective cost recovery policies for urban areas. Despite negative publicity, long standing contracts in these West African countries appear to be working, as have local contracts in Uganda. In each case, there is a reasonable amount of cost and performance data in the public domain, allowing people to query where their money goes. These 'windows of transparency' (see the Appendix for illustrations) grind away at the fiscal slack the corruption depends on. They also create a climate of confidence that may encourage further funding flows. While it is sadly unlikely that the water and sanitation goals will be met in most of Africa, hope lies in the lessons to be learnt.

**Globally, there is much to do**

The dynamics of water provision are highlighted in the 2010 progress report for water and sanitation ('Progress on sanitation and drinking-water, 2010 update') from the UN's Joint Monitoring Programme for the water and sanitation Millennium Development Goals. Between 1990 and 2008, 1,052million people living in urban areas have gained access to safe water (1,005million gaining household connections) and 813million to improved sanitation. However, population growth and urbanisation have meant that 1,089million more people now live in urban areas.

The WHO and UNICEF didn't mince their words in their report on 'Meeting the MDG drinking water and sanitation targets' in September. This coverage figures up to 2004 and makes it pretty clear that much needs to be done in urban areas if these targets are to be met, let alone in rural areas. Even though the number of people unserved is meant to be halved between 2000 and 2015, population growth and political inertia in urban areas is clearly outweighing many urban service provision initiatives:

**Watsan connections in urban areas, 1990 & 2008**

	Tap		Sewer	
	1990	2008	1990	2008
Developed regions	98%	98%	100%	100%
Developing regions	71%	73%	65%	68%
World	80%	79%	77%	76%

Source: UNICEF/WHO (2010) *Progress on sanitation and drinking-water*, Geneva

**Urban demand for access to safe watsan (water and sanitation) services by 2015 (million people):**

	Water	Sanitation
Eastern Asia & Pacific	290	330
Sub-Saharan Africa	175	178
South Asia	243	263
South-Eastern Asia	115	208
Latin America & Caribbean	121	132
Former Soviet Union	27	24
<b>Total</b>	<b>961</b>	<b>1,032</b>

Source: UN Millennium Project Task Force on Water & Sanitation, *Interim Report*, 2005

It is also evident that major projects cannot hide neglect in secondary cities (water coverage in the Philippines fell from 95% to 87% between 1990 and 2004, despite the transformation of Manila's services), while bulk water treatment and provision projects need to be pushed further down the pipes (a fall from 99% to 93% water coverage in China).

The most encouraging aspect of this report has been the gradual diminution of official 100% (or for the ultra realists, 99%) coverage rates, no matter how bleak other realities appear to be. Even so, it is unlikely that Zimbabwe really offered 'just' a 98% urban water coverage rate in 2004 and 99% in 2008 against 100% in 1990. Expect further progress (or regress) here as the 2015 targets start to loom.

Taking one example, India:

<b>WHO 2004 Report</b>	<b>1990</b>	<b>2002</b>
Urban drinking water access	88%	96%
Household connections	51%	51%
<b>WHO 2006 Report</b>	<b>1990</b>	<b>2004</b>
Urban drinking water access	89%	95%
Household connections	53%	47%
<b>WHO 2010 Report</b>	<b>1990</b>	<b>2008</b>
Urban drinking water access	90%	96%
Household connections	52%	48%



There is some significant slippage between these two yearly surveys, in turn suggesting a change in methodologies and mindsets and the cooler realisation that international largesse is becoming increasingly results oriented, which means that being bleakly honest about matters past and progress to the present does at least open up the prospect of future improvement, as long as those fickle sources of funds can be harnessed.

Along with the fear of losing face (while trying to attract foreign funds, always a subtle balancing act), there are the shifting sands of defining what 'access' means in the first place. There is a bare honesty about the household access data. In India, urban access means one standpipe per 30 households, or one every 162 people, while in the developed world, it means water delivered to your property. While overall access varies between countries and surveys, there is far less room for ambiguity about having a functioning tap within each household.

#### Urban households with individual access to improved water supplies:

% Household connection	1990	2004	2006	2008
Developed world	99%	99%	98%	98%
Developing world	70%	70%	69%	73%
Northern Africa	83%	92%	91%	91%
Sub-Saharan Africa	45%	36%	35%	35%
Latin America	85%	90%	97%	92%
Eastern Asia	82%	87%	87%	96%
Southern Asia	56%	50%	51%	51%
Western Asia	83%	94%	93%	93%

Sub-Saharan Africa and Southern India are in severe danger of being left behind the rest of the developing world, unless profound remedial action is taken over the next six years, along with some commitment to meeting the World Water Visions' 2025 target of universal water and sanitation coverage.

The OECD presented a different take on access to safe water in 2010:

Unserved – collect unsafe water	0.87billion people
Urban poor – collect safe water	0.58billion people
Rural poor – collect safe water	1.59billion people
Urban piped – basic regulation	1.77billion people
Rural piped – developing world	1.04billion people
Rural piped – developed world	0.20billion people
Urban piped – strong regulation	0.75billion people

That points to 870million people needing improved supplies as a matter of urgency and 2.17billion who would benefit from improved access.

#### Getting the funding together

Water projects remain riskier than almost all other forms of capital intensive projects. Between 1990 and 2005, 39% of all projects involving World Bank funding were either cancelled or in a risk position. The cancellation of the various Argentinean and Bolivian concessions during 2006-07 has not helped this. Even so, the ongoing quality of the portfolio has improved more rapidly than any other sector, perhaps due to the lessons learnt from the loans of the 1990s, especially that foreign exchange rate collapses do happen and they have to be taken seriously when local people have to pay for their consequences.

Sector	1995	2000	2005
World Bank overall	30%	15%	14%
Infrastructure	28%	15%	10%
Water & Sanitation	49%	14%	9%

Source: World Bank, (2005) *Water Supply and Sanitation Lending: Volume Rises, Quality Remains High, Water Supply and Sanitation Feature Stories*, Washington DC, USA

There is a general commitment from the various development banks to increase funding in the sector, but this funding is increasingly tied to higher expectations about operational reform and cost recovery. Thus the higher funding outlined below remains dependent on institutional reform and capacity building.

<b>Water &amp; sewerage disbursements (USD million pa)</b>	<b>2000-05</b>	<b>2006-10</b>
World Bank	1,280	2,500
African Development Bank	70	200
Asian Development Bank	790	2,250
European Bank for Reconstruction & Development	75	150
Inter American Development Bank	200	400

## **Problems**

### **NGO and political pressure**

Opposition towards the private sector by NGOs has been extensive. This has partly arisen through the conflation of a right to water as a human right with the right to free water (see Barlow & Clarke 2002 and Barlow 2007), along with opposition to globalisation (e.g. Brennan et al 2004) and private sector participation per se (summarised by Hall & Lobina 2006). While no firm evidence exists of any of these campaigns resulting in a concession being rescinded in developing economies, this may have been a contributory factor in Cochabamba and La Paz & El Alto in Bolivia.

### **Contract instability**

The World Bank has been involved with 713 water & sewerage PPP projects in 62 countries between 1990 and 2009 (World Bank 2010). The 64 cancelled or distressed contracts at the end of 2009 represented 9% of contracts and 34% by value. The distress level of 34% compares poorly with Electricity (10%), Telecoms (4%) and Transport (11%). The quality of the overall water and sanitation portfolio has improved during this time, with 49% of projects by value being identified as cancelled or at risk in 1995 against 28% for infrastructure overall, falling to 9% in 2005 against 10% for infrastructure overall (World Bank 2005).

The threat of a contract being rescinded has become a material disincentive for the international players, especially since 2000. 43 contracts serving a total of 47.9million people which have ended have been identified. In 11 cases (3.6million people) this was at the end of the contracts agreed life, while in the other 32 cases (44.3million people) contracts were ended either by the operating company or the municipality. In population terms, 14% of contracts have been rescinded; 2% of contracts awarded to local companies, 15% to regional companies and 23% for Transnational Corporations. All three rescinded contracts in the least developed economies (1.1million people) had been awarded to TNCs.

### **Having the wrong contract in the wrong place**

Impossible conditions, such as unrealistic demands being placed upon current and future customers (even when the bidder does not appreciate these at the time) are not an encouragement for further investment. These can be particularly important when seeking to make a concession politically acceptable. In Buenos Aires, under Argentinean law, if a consumer was within a certain distance of a pipeline, they were obliged to connect to it (Lindfield, 1998) which led to the perception in some cases that these services were being imposed on poor areas.

In Bolivia, contract conditions were even more divisive. The Cochabamba concession attracted a single proposal, which was then developed through negotiation (World Bank & PPIAF, 2006). Aguas de Tunari was awarded the concession in October 1999 with the concession starting in January 2000. Law 2029 meant that the concession covered all water resources in its area and all actual and potential customers had to connect to the system and well owners were obliged to use the company's water irrespective of their ability to pay (Castro, 2006). No public consultation was taken either over the law or the concession process (Slattery, 2003). Contract disputes were to be dealt with through the International Centre for the Settlement of Investment Disputes, the International Chamber of Commerce and the United Nations Commission on International Trade Law (Castro, 2006).

**Regulators, dispute mechanisms and dealing with poor data**

The Aguas Argentinas contract was based on performance targets (connections, levels of service, metering) rather than capital spending. A price formula was drawn up, which would be reviewed every five years (Lindfield, 1998). But ETOSS was staffed by former OSN employees and not formally qualified for their new roles. It has been suggested that the monitoring process was politically motivated (Zerah and Graham, 2001).

In 1994, a tariff rise of 13.4% was imposed because the infrastructure condition was found to be worse than expected. Since 1996, AA and ETOSS went into a series of contract renegotiations over bill collection and charging. By 2001, it appears that AA was experiencing financial problems and from 2001, ETOSS imposed a series of fines relating to AA's performance as the company reduced spending in the wake of the 2001 economic crisis and the 2002 peso devaluation. Between 2003 and 2005, further renegotiations took place but were inconclusive and the contract was handed back in 2006 (Castro, 2006).

**Foreign exchange risk**

It is surprising that some highly reputable companies, with a long track record in international business have run into major difficulties with foreign exchange risks. The inability to avoid these losses reflects a fundamental tension between using a TNC to attract hard currency debt and the TNC having to use soft currency tariff revenues to service this debt. The argument that foreign exchange crises are exceptional is facile, as they have affected TNC concessions in Argentina, Indonesia and the Philippines, amongst others.

**The unexpected**

The best two examples involve sewerage and sewage treatment concessions in Malaysia and Thailand. They are relevant for the water sector as the operators are the same and the perceptions likewise. In Malaysia, a recession meant that in order to stimulate the economy, price restraints were imposed on the contract making it unviable. In Thailand, operational constraints (allowed working hours) were imposed on the contract, along with a revised specification (more infrastructure work than anticipated), which led to exceptional losses.

**Some new approaches considered****New approaches: Making sub-sovereign debt a viable proposition**

Sub-sovereign entities in developing economies, such as municipal water utilities, have considerable problems in raising debt funding for infrastructure extension and upgrading, because neither they nor their municipality are likely to have a credit rating. This means that funding is either unavailable (making companies dependent on ODA or municipal/state funding) or very expensive as it has to be raised either from bank loans or from unrated debt issues. In addition, their relatively small size means that the credit rating and fundraising process is also expensive and any bonds so raised will face liquidity problems. Local government bond issues are very rare in developing economies, even when denominated in local currencies. Their high coupon makes the financing of their repayment more challenging. For example, municipal bonds in India (except for Hyderabad in 2002, AA+ rated with a coupon of 7.00%) have a coupon of 11.50–14.75%.

Both the Camdessus and Gurria reports look at the potential for multilateral institutions, such as the development banks, to play a role in bringing in domestic private capital for infrastructure finance. The Camdessus Panel Report identified the need for new sources of municipal project finance with guarantees for projects with capital spending in the region of USD0.1–100million. A number of municipal water and sanitation project financing initiatives have been developed to date. The World Bank through the IFC and related initiatives is seeking to develop sub-sovereign debt support. USAID, the US ODA entity, is also recognised as a significant partner in these initiatives.

**New approaches – learning to live with risk**

The first step for financiers and investors is to get to know the sub-sovereign debt markets outside Western Europe and North America. The EBRD is an example. Since 1991, it has always been allowed to lend to sub-sovereign entities. Between 1997 and 2003, it fundamentally altered the nature of its central Europe and Russia infrastructure portfolio:

**EBRD – structure of central Europe and Russia portfolio, 1997 and 2003:**

<b>Portfolio</b>	<b>1997</b>	<b>2003</b>
Sovereign	82%	37%
Municipal	16%	36%
Private	2%	27%

Source: EBRD

This shift has been reflected in its Municipal & Environmental Infrastructure loan portfolio where significant loans are being extended towards sub-sovereign entities. This has been important in raising the profile of such lending, but these markets are decidedly at the advanced end of the developing economies.

**New approaches – pooled finance in the Philippines**

When projects are too small for funding, pooling them helps to drive down administrative costs and provides a more attractively-sized bond. In the Philippines in 2003, the Land Bank of the Philippines developed the Water District Development Project (WDDP), a local dedicated fund for water and sanitation projects. The driver behind the fund was to enable local municipalities to raise finance for capital projects by applying to a common pool of funds to reduce their costs. USD36.3million was raised with a 12 year term and a coupon of 12% with a 0.25% per annum commitment fee. At least 10% of the project equity has to be raised by the municipality and the WDDP provides technical assistance.

By June 2003, 13 projects obtained loans of USD27.6million, ranging from USD0.4million to USD7.6million. Individual projects currently have to pay the Land Bank interest at 15% pa, implying a decrease in the debt coupon of 3% being gained through project pooling. Pool financing is also a risk management tool, as it allows for the diversification of risk through a group of similar projects and municipalities.

More recently, the Local Government Unit Guarantee Corporation (LGUGC, 38% owned by the Bankers Association of the Philippines, 37% by the Development Bank of the Philippines and 25% by the Asian Development Bank) guarantees repayments to private investors in the event of default on eligible local government loans and bonds. The LGUGC provides the guarantee at a fee of 0.5% to 1.25% pa and an internal credit screening and rating system. (Source: Tremolet S (2009) Private money for public water – A safe haven in the midst of a financial storm? A presentation to ICEA, 16 June 2009).

**New approaches – Revolving credit in Colombia**

Financiera de Desarrollo Territorial (Findeter) was founded in 1989 and is 90% held by the Colombian government and 10% by municipalities. It lowers the cost of loans to municipalities through rediscounting up to 85% of the debt and holding the debt for 8–15 years rather than the usual 3–5 years. Where appropriate, a capital grace period of up to three years and an interest grace period of up to one year can be utilised.

This means that commercial banks are able to operate in the municipal debt market, while the banks retain the risk. 25% of loans to date have been for water and sanitation. In 2005, the Colombian government approved COP366billion (USD170million) on loans for water and sewerage systems in 300 municipalities. Findeter receives its funding from its capital and retained earnings, as well as through external borrowing, primarily from the Inter-American Development Bank and the World Bank, and is rated AAA (Duff & Phelps). 78% of its revenues come from existing loans. (Source: Tremolet S (2009) Private money for public water – A safe haven in the midst of a financial storm? A presentation to ICEA, 16 June 2009).

In December 2009, this was taken further by Grupo Financiero de Infraestructura Ltda (GFI), which has sold COP124.9billion (USD62.5million) of bonds for financing water and wastewater projects in local municipalities. The issue has been developed on the state revolving facility (SRF) principle. 29 small and medium municipalities have been organised into a legal trust which acts as the bond issuer and funds the loans and allows the municipalities to leverage the annual transfers of funds from the national government. In turn, it allows local investors access to long term financial products which are supporting local activities. The bonds were bought by local institutions, such as pension funds and insurance companies. With an AA+ rating from Moody's BRC Investor Services and a 19 year term,

the issue is denominated in Colombian inflation adjusted units (UVR) and has a coupon of 8.0%. The Central Bank's benchmark interest rate has been held at 3.5% in recent months so this represents a 450 basis points (4.5%) premium over Colombia's base rate.

*Sources: Tremolet S (2009) Private money for public water – A safe haven in the midst of a financial storm? A presentation to ICEA, 16 June 2009 & Colombia Infrastructure Group LLC, Press Release, 15<sup>th</sup> December 2009*

### **New approaches – Microfinance in Bangladesh, Grameen-Veolia Water**

The Grameen-Veolia Water joint venture was formed in 2008 between the 2006 Nobel Peace Prize-winner and founder of the Grameen microcredit Bank Muhammad Yunus and Veolia Water AMI. Veolia Water AMI is Veolia Environnement's subsidiary for Africa, the Middle East and India (with IFC and PROPARCO as shareholders). In 2009 they inaugurated the first water treatment plant intended for village populations living in remote rural areas of Bangladesh. Most of the groundwater in this part of the world is contaminated by arsenic. The plant will supply drinking water to 40,000 people in Goalhari, a village, 100km from Dhaka. The water is distributed via a system of storage reservoirs, standpipes, and deliveries to the farthest-flung locations. This will be followed by four further treatment plants to provide a total of 100,000 people with drinking water, living in villages in central and southern Bangladesh.

As part of this pilot project, which is based on the economic principles of "social business", drinking water is sold to inhabitants for a price of EUR0.002 per litre, which is 100 times cheaper than locally-available bottled water. All profits will be ploughed back to drive the development of other water-related projects in Bangladesh.

*Source: VE Press Release, 24<sup>th</sup> June 2009*

### **New approaches – innovative bond structures in India**

Tamil Nadu in India has seen a series of initiatives designed to take the pooled finance concept a stage further by enhancing the credit rating of the project pool through structuring the debt to provide a series of credit guarantees which can be used to create an investment grade product, with a significant reduction in the debt's coupon.

In 2002, USAID helped develop the Water and Sanitation Pooled Fund (WSPF), a bond that was partially guaranteed by USAID for providing water and sewerage infrastructure finance to seven municipalities in Tamil Nadu in India. Structuring the debt using a guarantee means that the bond was issued in Indian Rupees (eliminating foreign currency risk), had an enhanced credit status (AA investment grade ratings from two leading Indian rating agencies: L AA (SO) by ICRA and Ind AA (SO) by Fitch), with the bond's repayment supported by a portfolio of loans on-lent to the municipalities, while pooling a number of projects reduced the bond issue's transaction and rating costs and made the issue more attractive to investors.

Three levels of credit enhancement were used:

1. The escrow of the property tax and other collections made by the municipalities, covered under a tripartite agreement among the WSPF, municipalities and their banker.
2. A Debt Service Reserve Fund, called the Bond Service Reserve Fund (BSRF), was set up by the government of Tamil Nadu with liquid investments of INR69million.
3. A guarantee issued by USAID to the extent of 50% of the principal, with the balance covered by an undertaking by the Government of Tamil Nadu, in the form of a government order that the shortfall would be replenished by the Government of Tamil Nadu to the BSRF by deducting their respective share of State Finance Commission (SFC) funds accruing to the municipalities involved.

The bond had an issue size of INR304.1million and a coupon of 9.20% pa, with a tenor of 15 years, carrying a put and call option at the end of the 10th year. The bond is to be redeemed in 15 equal annual instalments with an annual payment of coupon on a diminishing balance method.

Subsequent events have shown this concept remains a work in progress. For example, the monthly municipal repayment mechanism did not take into account the effect of the monsoon season on

repayment scheduling. Even so, the WSPF has set an encouraging precedent. Similar bonds have been developed in Chennai and Karnataka, each raising USD22million. There is room for flexibility with the escrow accounts, as individual municipalities can select the most effective repayment revenue source – water bills, electricity bills, rental or tax income, for example. The figure below outlines the relationship between funding sources for a structured obligation.

From this, it is evident that structuring can be used to enhance credit quality, especially when allied with the optimum use of credit enhancement (limited funds need to be disbursed with care) and that they need credit enhancement by multilateral agencies or the government. The structured obligation operates through the escrowing of dedicated revenue streams from the municipalities. A full guarantee from an entity with superior credit profile needs to be allied with a partial guarantee mechanism for pledging of cash collateral and partial guarantees covering the amount raised, its tenor and interest rate.

Structured finance enables ODA to act as a catalyst for municipal water and sewerage infrastructure projects, with the total guarantee funding supporting approximately three times of private sector investment in bond issues.

### **Spreading the word - International initiatives**

The World Bank, IFC and regional development banks all support such initiatives, principally through supplying finance for the national municipal funding agencies. The active development of structured and pooled financing has been pioneered by USAID and more recently by Japan's ODA organisation, the Japan Bank for International Cooperation (JBIC) and the UK's Department for International Development (DfID). The challenge is to mobilise enough new funding for these good ideas to make a greater difference.

### **New approaches: Driving down the cost of capital spending**

The scope for technical innovation in delivering basic services appears to be limited. Yet there is a great deal to be done, especially in developing devolved technologies and making systems operate more efficiently so that technological innovations allow funding to go further. At one end, this involves the rehabilitation and upgrading of extant systems (remote water metering and pipeline monitoring and rehabilitation systems), while upgrading their treatment capabilities (devolved, non chlorine based forms of drinking water treatment such as low maintenance UV systems and the application of electrodes), along with efficient methods of introducing appropriate and upgradeable forms of water and wastewater treatment and recovery.

The latest figures provided by the UN (the UN Millennium Project Task Force on Water & Sanitation, 2005) include an assumed 15% for overheads and unspecified O&M costs, implying that capital spending costs account for 60-80% of the figures for sanitation and sewage treatment services cited below:

<b>New service connection</b>	<b>USD per person</b>
Improved traditional practice	10
Simple pit latrine	45
Ventilated improved pit latrine	65
Pour-flush latrine	70
Septic tank	160
Sewer (local labour)	175
Conventional sewer	300
Sewerage and secondary treatment	450
Sewerage and tertiary treatment	800

In fact, for medium to larger cities, the western experience shows that the cost of sewerage and secondary and tertiary treatment is more likely to be in the range of USD350-500 per population equivalent (PE). Much of the disparity is due to the relentless drive for lower costs in countries such as the UK. In Europe, using the private sector to develop sewerage treatment assets has driven down capital costs by 15-40% since the early 1900s.

It is also clear that labour costs are a significant element in the laying of basic infrastructure and need to be factored into regional estimates. For treatment facilities, differences in labour costs are less significant as most of the costs are taken up by equipment.

The World Health Organization's 'Global Water Supply and Sanitation Assessment 2000 Report' (WHO, Geneva, 2000) used the following capital spending estimates for its projections. Capital spending costs only:

USD per capita		Africa	Asia	Latin America
Water	House connection	102	92	144
	Standpipe	31	64	41
Sanitation	Sewer connection	120	154	160
	Small bore sewer	52	60	112
	Septic tank	115	104	160

#### NGO estimates for connecting urban watsan projects:

USD per capita	Mali	Burkina Faso	Niger	Nepal	Tanzania
Water	106	104	88	40	150
Sanitation	41	46	22	45-95	50

Sources:

*Mali: ISW (2005) Blue book Mali, ISW, Montreal, Canada*

*Burkina Faso: ISW (2005) Blue book Burkina Faso, ISW, Montreal, Canada*

*Niger: ISW (2005) Blue book Niger, ISW, Montreal, Canada*

*Nepal: WaterAid (2004) The Water & Sanitation MDGs in Nepal, WaterAid, Nepal*

*Tanzania: WaterAid (2005) USD2 billion dollars, the cost of water and sanitation MDGs for Tanzania, WaterAid, UK*

The per capita cost of water and sewage treatment facilities is related to their size, so comparative data has been restricted to the medium to large scale facilities found in larger towns and cities (more than 100,000 people).

Treatment facilities (USD per capita)	Range
Water	20 - 100
Sewage treatment (primary)	20 - 60
Sewage treatment (secondary)	150 - 180

Source: *Envisager*

The private sector has a broad remit for driving down costs. Small bore sewerage networks built with local labour in El Alto, Bolivia between 2000 and 2002 under AISA, the concession managed by Suez until this year cost USD90 per capita. Given the contentious nature of private sector participation, it remains likely that more expensive municipally operated approaches will usually be adopted.

In per capita terms, improving urban water, sewerage services and wastewater treatment ought not to exceed USD100-140 per capita, while providing these services from scratch should not cost more than USD300-450 per capita, less USD120-160 without full wastewater treatment. Suez has been able to provide basic water and sewerage services in Latin America for USD100 per capita. Rural service provision is appreciably cheaper, concentrating on the ready availability of water a short distance from each house, along with sanitation and effluent recovery and composting systems.

#### New approaches - Reducing water losses and unbilled water in developing economies

According to Lienberger (WATER 21, June 2008, p48, International Water Association, London, UK) a 50% fall in urban water losses for low and middle income countries would mobilise an extra 11 billion m<sup>3</sup> of water each year, allowing the public supply of water to a further 130 million people and at the same time, improving utility cash flow by USD4 billion pa. The latter is the equivalent to funding 10 million new household water and sanitation connections per annum. The workshop looked at a number of experiences in a number of cities and countries. Quantitative data provided about water loss reduction schemes at the workshop can be summarised as follows:

APPENDIX 3: THE PRIVATE SECTOR AND THE MILLENNIUM DEVELOPMENT GOALS

Area	Category	Start year	Losses	End year	Losses
Uganda	NRW	1998	52%	2007	33%
Zambia	UFW	2003-04	52%	2006-07	43%
Lusaka, Zambia	UFW	2001	52%	2003	25%
Mexico City	Leakage	2001	35%	2002	23%
Lima, Peru	NRW	1995	50%	2007	37%
Toson, Egypt	NRW	2005	35%	2007	15%
Zagazig, Egypt	Leakage	2006	28%	2006	10%
Zagazig, Egypt	NRW	2006	35%	2006	18%
Madaba, Jordan	UFW	2005	45%	2007	34%
Budapest, Hungary	NRW	1996	61%	2007	32%

Source:

*Ardakanian R and Martin-Bordes J L (2009) Proceedings of International Workshop on Drinking Water Reduction: Developing Capacity for Applying Solutions, UN Campus, Bonn 3-5 September 2008. UNW-DPC, Publication 1, Bonn, Germany*



**APPENDIX 4:**  
**GLOSSARY OF WATER AND FINANCE TERMS AND ABBREVIATIONS**

## APPENDIX 4: GLOSSARY OF WATER AND FINANCE TERMS AND ABBREVIATIONS

**Abstraction.** The taking of water from surface water (rivers, lakes and reservoirs) and groundwater (boreholes and springs from water bearing rocks such as chalk, limestone and sandstone).

**Acre-Feet.** Expression used in the USA to describe groundwater resources. 1 acre-foot = 1.482MI (1,482m<sup>3</sup>)

**ADB.** African Development Bank/Asian Development Bank. The former is sometimes known as the AfDB and in general are not to be confused with each other.

**Affermage.** See Lease.

**AMP.** Asset Management Period. The five yearly operating cycles in England and Wales set out by Ofwat, the industry regulator since 1989. AMP4 runs from 2005-10.

**Ammoniacal nitrogen (NH<sub>3</sub>).** Ammoniacal nitrogen is often found in water as a result of the discharge of sewage effluent with high levels affecting the quality of fisheries.

**Aquifer.** Rock and soil which holds water, an underground water source for groundwater.

**Artesian.** Water abstracted from groundwater resources.

**ASEAN.** Association of South-East Asian Nations.

**Asset Sale.** The full privatisation of utility services via the outright sale of their assets and an operating licence to shareholders or to a private sector company. This is known as the 'British Model' after the 1989 privatisation of the WASCs of England and Wales. Placing the operating assets in private hands in perpetuity has proved politically very contentious and, as a result, has not been used elsewhere, save in Chile and to a lesser extent, in the Czech Republic and in Belize.

**ATO.** Ambito Territoriale Ottimale. The ideal area for water and wastewater contracts in Italy as designated by the 1994 Galli Law. This law broadly seeks to rationalise some 6,800 water distribution regions into a more manageable 89.

**BATNEEC/BAT.** Best available technology not entailing excessive cost/Best available technology. The former's expediencies have earned it the nickname CATNIP, or cheapest available technology not involving prosecution.

**Biosolids.** The new expression for sewage sludge which has been processed for recycling. The latter refers to its application on agricultural land or after further treatment, as compost sold for horticulture and domestic gardens. As far as PR goes, a better term than refined human excreta.

**Biotic.** Plant, bacterial or animal life. Biodiversity refers to the optimal diversity of species in an ecosystem. The greater the number of species in a given ecosystem in relation to its ideal number, the less perturbed the habitat is.

**Blue Flag.** Under the EU's bathing waters directive, designated bathing areas that meet the stricter 'Guideline' standard for water quality, as well as satisfying standards for safety, can be awarded a 'blue flag'.

**BMO.** Build, Manage, Operate. A form of O&M contract.

**BOD/COD.** These are chemical/biochemical determinants of water quality. As plants and animals do not necessarily respond to numbers and engineering standards, there is a move towards complementing these criteria with a biological assessment of the water's quality. For example, in several families of invertebrates, better water quality results in a greater degree of species diversity. Indicator species are used to measure water quality.

**Biochemical oxygen demand (BOD).** This is the amount of dissolved oxygen in water consumed in test conditions over a period of five days by the microbiological oxidation of biodegradable organic matter contained in effluent. BOD measures the amount of oxygen consumed, usually by organic

pollution (mainly sewage effluent and effluents from the wood and paper industry), so lower values indicate better quality.

**Chemical oxygen demand (COD).** Unlike BOD, this includes all the oxygen consumed by effluents.

**BOT.** See Concession.

**'British Model'.** See Asset Sale.

**CAO.** Chief Accounting Officer.

**CAP.** The Common Agricultural Policy of the European Union.

**Capex.** Capital spending. Money spend on new assets or replacing or upgrading extant assets.

**Carcinogen.** A substance which is believed to be a cause of cancers in humans.

**CEO.** Chief Executive Officer.

**CFO.** Chief Financial Officer.

**Coliform bacteria.** Gut living bacteria that are discharged with excreta. Drinking water contaminated with coliform bacteria is the main cause of diarrhoea and other intestinal infections. The most useful indication that sewage effluent is being discharged into a body of water.

**Combined sewers.** A sewer that carries both sewage and storm water runoff.

**Common Ownership.** A form of privatisation where the operating assets are corporatised and a minority of the shares in the asset-holding company are offered to one or more private sector companies. This is known as Kooperationmodell or the 'German Model'. A further variant is the Betreibermodell, where the private sector operator pays a fixed rate for the right to operate the services.

**Concession.** The granting of the right to operate given utility services for a locality for an agreed period of time. Unlike outright privatisation (see Asset Sale), the assets are transferred to municipal ownership at the end of the concession's life. In a full utility concession, the collection of water and sewerage tariffs is included. There are also four main variants of the concession model (BOO, BOT, TOT and BOOT) where tariff collection usually remains in municipal hands. These versions are typically seen where the municipality needs private sector finance and management for new facilities.

- **BOO (Build Own Operate).** The private sector company builds, owns, maintains and operates the facility for the length of its operating life.
- **BOOT (Build Own Operate Transfer).** Similar to the BOO contract, save that the private sector company hands over the assets to the municipality at the expiry of the concession.
- **BOT (Build Operate Transfer).** Similar to the BOOT except that the private sector company hands over the assets to the municipality on completing construction work.
- **TOT (Transfer Own Transfer).** Take over an existing facility, rehabilitate and subsequently operate it and hand over the assets to the municipality at the expiry of the concession.

**COO.** Chief Operating Officer.

**Corporatised.** A utility that is in municipal ownership while being run in a manner similar to that of a private sector entity. A corporatised utility will be structured as a limited liability company, with its share capital controlled by the municipality, while publishing the equivalent of an annual report replete with a profit and loss account, balance sheet and cash flow data.

**Cryptosporidium.** Parasitic micro-organisms which live in water and are a cause of diarrhoea. The presence of 'crypto' is arguably an indicator of an under-maintained distribution network.

**CSD.** Commission on Sustainable Development of the UN.

**DBFO.** Design, Build, Finance and Operate. A form of BOT concession.

**DBO.** Design, Build and Operate. A form of BOT concession.

**DBOT.** Design, Build, Operate and Transfer. A variant of the BOT contract incorporating the design of the facility.

**DfID.** The UK Government's Department for International Development, a government agency for promoting development initiatives.

**Digestion.** Process for stabilising sewage sludge before application to land. Digestion involves heating the sludge to 40°C to reduce the number of bacteria and pathogens. Anaerobic digestion (see Pasteurise) generates methane, which can be extracted for energy recovery.

**Distribution Loss.** Non-contentious expression for leakage (q.v.) which also includes other losses including theft of water.

**Dry tonne.** Sewage sludge or industrial effluent after all water has been removed. This is the standard measure used for comparing sewage sludge generation and disposal statistics.

**EBITDA.** Earnings before interest, taxation, depreciation and amortisation.

**EBRD.** European Bank for Reconstruction and Development. Loans for municipal and private services, with an emphasis on the EU candidate countries.

**Ecosystem.** The community of organisms associated with a particular habitat. It ought to be noted that there is no such thing as 'ecological', as in 'ecologically friendly', since ecology is the science of studying the environment. Expressions such as 'environmentally sound' do, however, make sense.

**Effluent.** Liquid wastes typically discharged into a body of water. Strictly speaking, it is the liquid discharged from a wastewater treatment plant into a body of water, which is meant to meet various quality criteria.

**EIB.** European Investment Bank. Loans for municipal and private enterprises, priority within the EU.

**EPA.** (National) Environmental Protection Agency.

**EU.** The European Union's directorate general for environmental issues is DG XI. The EU acts as a driver for and against water quality. In subsidising inefficient forms of industrial (intensive) agriculture, it is possible that the EU's Common Agricultural Policy (CAP) does more damage to water resources than all of DG XI's environmental initiatives combined.

**Eutrophication.** The process by which lakes and ponds become enriched with dissolved nutrients, resulting in increased growth of algae and other microscopic plants. Nitrogen and phosphorous enrichment of water, which causes algal growth to extend beyond that associated with the particular aquatic environment. Degrades the quality of the ecosystem and impairs water quality. The main causes are industrial agriculture (fertilisers and slurry) and excess effluent discharges.

**Evapotranspiration.** The removal of water from a surface through evaporation.

**FAO.** Food and Agriculture Organisation of the United Nations.

**'French Model'.** Also known as affermage, (see Lease).

**Fresh water.** Water that contains less than 1000milligrams per litre of dissolved solids such as metals and nutrients.

**FY.** Financial Year.

**GEF.** Global Environment Facility (World Bank)/Global Environment Fund (privately held).

**'German Model'**. Also known as Kooperationmodell and the Betreibermodell (see Common Ownership).

**GDP.** Gross domestic product – most effectively compared through using the Purchasing Power Parity tool, PPP.

**Green Flag.** EU bathing water quality award for smaller and rural beaches and resorts, similar to the Blue Flag scheme.

**Groundwater.** The supply of fresh water found beneath the earth's surface (usually in aquifers) which is often used for supplying wells and springs.

**Groundwater recharge.** The inflow of water to an aquifer.

**Habitat.** United Nations Centre for Human Settlements (see UNCHS).

**Hague.** The second World Water Forum, held in the Hague in 2000. Unveiled the 2025 target for universal water and sanitation provision, allied with greater private sector investment.

**IADB.** Inter-American Development Bank. Development Bank primarily concerned with financing infrastructure projects in Central and South America.

**IFC.** International Finance Corporation (World Bank, investment banking and privatisation).

**IMF.** International Monetary Fund – encourages the sale of assets as part of state refinancing.

**Inset Appointment.** Term for water provision contracts awarded to a new company within an incumbent company's service area. A form of water service provision competition, mainly seen in the UK.

**IPO.** Initial Public Offering, whereby a company's shares are listed and subsequently traded on a recognised stock exchange for the first time.

**IPPC.** Integrated pollution prevention and control regulates the discharges from industrial processes into the air, land and water.

**ISPA.** Instrument for Structural Policies for Pre-Accession. EU funding for Accession Candidates, providing up to 75% of the cost of transport and infrastructure projects.

**IWRM.** Integrated Water Resources Management.

**Johannesburg.** The Second Earth Summit was held at Johannesburg in 2002. Targets to halve the proportion of people not connected to water or sanitation by 2015 were agreed.

**K.** The percentage above (or below) the Retail Price Index that Ofwat allows a water company in England and Wales to alter its fees in a given year. This has evolved from the 'RPI-X' regulatory model pioneered by Oftel when British Telecommunications was privatised in 1984 and is an example of price driven regulation as opposed to the rate of return model used in the USA.

**Kyoto.** The third World Water Forum was held at Kyoto in March 2003. Despite hopes that it would develop a framework to implement The Hague and Johannesburg proposals at the country level, little of substance took place due to NGO disruptions.

**L.** Litre.

**Leakage.** Loss of water through the distribution system either at joints between pipes or due to cracks in pipes. Because the perceived wastage of water is a contentious subject, definitions of leakage rates tend to vary. Pipes are affected by cold weather (ice-cracking) and dry weather (subsidence) as well as structural deterioration. Approximately one third of leakage takes place within the customer's pipe network. It is also affected by water pressure, leading to a pay-off between water supply pressure and leakage rates.

**Lease (Affermage).** Privatisation model pioneered in France whereby the private sector company rents the assets from the municipality for a given length of time. The municipality is responsible for

investment while the company does the tariff collection. In France, this evolved into a form of concession model, with the company carrying out an agreed programme of asset improvements over the life of the contract.

**m<sup>3</sup>.** Cubic metre, or 1,000litres. Measure of water volume. One cubic km is one million m<sup>3</sup>.

**Mains.** Pipes that carry treated drinking water to the customer's supply pipe via a connection pipe. Also called the distribution mains.

**Management Contract.** The simplest form of privatisation, where the private sector company provides management support for the operation of the assets. Usually seen as a means for the private and public sector entities to get to know each other.

**Mexico City.** The fourth World Water Forum was held at Mexico City in 2006. A low key event, but one where issues about funding and meeting the MDGs were taken more seriously than in the past.

**MDG.** The Millennium Development Goals were drawn up in 2000 and ratified in 2002 by the United Nations as a series of human development targets to be reached by 2015. The water and sanitation MDGs aim for a halving of people worldwide without access to safe water and sanitation by 2015.

**MENA.** Middle East and North Africa.

**MG/day.** 4.55million metres per day. A volumetric measure used in the USA.

**MI/day.** Megalitres per day (1,000m<sup>3</sup> per day). Measure of water availability.

**Monitoring Techniques.** Monitoring needs to take greater account of water quality in biological, not chemical terms. Sometimes this is good for standards – lowland, slow flowing rivers can have low levels of dissolved oxygen – but usually this will mean tighter criteria.

**Mt/pa.** Million tonnes per annum.

**MWA.** Municipal Water Authority. The body controlling the water and wastewater service activities in Bangkok, Thailand.

**N/A.** Not Available.

**Nitrates (NO<sub>3</sub>).** Nitrates are formed naturally in the soil by micro-organisms, but are also produced industrially and used as fertilisers. Nitrates are the nutrients, which in most saline waters control the production of algal growth with high levels of nitrates in the water causing eutrophication through algal and macrophyte growth. Furthermore 'blue baby disease', an affliction of the blood's oxygen-carrying capacity, is associated with drinking water containing nitrogen in the form of nitrates.

**NGO.** Non Governmental Organisation.

**Non-accounted for water.** The proportion of water put into a system that does not end up being paid for either directly or indirectly.

**O&M (Operation and Maintenance).** A step further from management contracts, but not a privatisation in the sense of a concession or asset sale. Here the private sector company operates and maintains the extant assets for a given period of time, but is not involved in the development of these assets or new facilities.

**ODA.** Overseas Development Assistance. Infrastructure development aid.

**OECD.** Organisation for Economic Co-operation and Development. Global grouping of 24 more developed economies.

**OFWAT.** Office for water services, the water regulator for England and Wales.

**Opex.** Operating expenditure. Money spent maintaining the extant infrastructure and using it to provide a service.

**PAH.** Polyaromatic hydrates. A toxic industrial pollutant of increasing concern in EU and WHO water quality assessment criteria.

**Parastatal.** A state held entity that operates at least nominally independently of the state. A Parastatal may also operate as a corporatised (q.v.) entity.

**Pasteurise.** Sewage sludge which is more extensively treated than digested sludge (q.v.). After heating the sludge to 60°C for several days, all pathogens and bacteria are removed, making it satisfactory for a wide range of agricultural applications. The main techniques are known as anaerobic digestion and composting.

**Pathogen.** An organism which is capable of causing a disease.

**PCBs.** Polychlorinated biphenyls were mainly used for electrical transformers. They do not degrade and are understood to be carcinogens which can bioaccumulate (build up in an organism's body, typically in fat reserves) to a dangerous degree. Their manufacture was banned in 1977, but some 60% of all PCBs manufactured remain in use.

**PE.** The population equivalent or amount of oxygen demand (see COD/BOD) generated and discharged by the average person each day. In a typical town, it is 1.5 to 2.0 times the population.

**P/E.** Price Earnings Ratio (PER). A company's share price divided by its historic financial year (FY) earnings per share.

**Pesticides.** There are two main classes of pesticides: chlorinated hydrocarbons are long-lived and capable of being concentrated up the food chain (this is called bioaccumulation). The second group is the organophosphates which are short-lived and presumably degrade to 'harmless' end products, but whose long-term environmental impact is not yet known.

Chlorinated hydrocarbons:  
Aldrin, Endrin, Benzene, Hexachloride,  
DDT, Dieldrin, Endosulfan and others

Organophosphates:  
Azodrin, Malathion, Parathion, Diazinon,  
Trithiopl, Phosdrin and others

**PFI.** Private Finance Initiative. A tool developed in the UK in the mid 1990s for awarding single projects to the private sector on a concession basis.

**Phosphates.** Phosphates are another nutrient, responsible for the eutrophication that mostly stems from sewage effluent with the remainder mainly from agricultural inputs and from extensive use of detergents.

**Physicochemical treatment.** The treatment of liquid wastes to reduce their environmental impact (see BOD/COD).

**Plumbsolvency.** The ability of water to dissolve lead from piping or solder. Soft waters (e.g. granite) are more plumbsolvent than hard waters (e.g. chalk). Soft water is defined as water that has less than 60 milligrams of calcium carbonate (lime) per litre.

**Potable.** Water that is fit for human consumption, as defined by World Health Organisation (WHO), EU or national standards.

**PPP.** Polluter pays principle, whereby a discharger of polluting substances pays a fee relating to the pollution load discharged. PPP can either be used to encourage dischargers to minimise their pollution loads or to finance the development of an appropriate effluent treatment network.

**PPP.** Purchasing Power Parity. A tool developed to illustrate the relative purchasing power of a common currency (in GDP per capita terms) in different economies. One US dollar goes further in India than it does in Japan.

**PPP.** Public-Private Partnership, where the private sector manages state or municipally held assets on a partnership basis. 'PPP' is a common TLA (triple letter acronym) affecting the water sector.

**PSP.** Private Sector Participation. Another TLA for PPP.

**PWA.** Provincial Water Authority. The body controlling the water and wastewater service activities in urban areas outside Bangkok, Thailand.

**Raw water.** Water from surface or ground sources prior to treatment.

**Red List.** Substances deemed harmful to the environment. Their discharge into the environment is to be brought under the control of the EU's IPPC directive. Grey List substances are of intermediate toxicity and are subject to a less stringent set of controls.

**Reservoir.** A body of water, usually artificially impounded, for maintaining controllable supplies of raw water. Prior to distribution, it is usually sent to a treatment works to be made potable and held in a service reservoir.

**River basin.** A term used to designate the area drained by a river and its tributaries.

**Sanitary sewers.** Underground pipes that carry off only domestic or industrial waste, not storm water.

**Septic tank.** Tank used to hold domestic wastes when a sewer line is not available to carry them to a treatment plant; part of a rural on-site sewage treatment system.

**Sewage.** Domestic sewage mainly consists of human excrement. Agricultural sewage has the same environmental impact, but its legal status is more ambiguous (as long as it is not discharged directly into watercourses).

**Sewage sludge.** The House of Lords, in its 1991 paper on the EU's UWWTD, perhaps harks back to school when describing sewage sludge as having "the consistency of thin semolina." The principal by-product from sewage treatment. Typically consisting of 96-97% water and 3-4% dry solids, it is usually measured in terms of dry solids to allow international comparisons to be made.

**Sewage treatment.** This usually involves a series of phases, each designed to progressively reduce the environmental and health impact of the effluent. Sewage is carried in the effluent either as solid matter or in dilute, suspended solids. While several performance criteria are used to assess the performance of a sewage treatment works (mainly, the removal of silts, BOD and ammonia), each level of treatment can be judged by its ability to remove these solids from the effluent stream prior to its final discharge. There is a fairly close relationship between ultimate solids removal and the lowering of an effluent stream's BOD.

Level of treatment	Process involved
None and Preliminary	Screening out of solids
Primary (1°)	Settlement to remove solids from effluent
Secondary (2°)	Biological treatment to remove suspended solids
Tertiary and Advanced	Further nutrient removal via filtration, etc.

Level of treatment	Percentage of sludge removed	BOD removal
None and Preliminary	2% (range 0-5%) of sludge removed	0-5%
Primary	30% (range 10-40%) of sludge removed	2-35%
Secondary	90-95% of sludges removed	75-90%
Tertiary and Advanced	99-100% of sludges removed	95-98%

- **Preliminary/Screening.** Intended to remove solids flushed down lavatories, such as condoms, tampons and nappies. Reduces the aesthetic impact of the sludge without affecting its environmental impact.
- **Primary (1°).** Physical treatment, where the effluent is placed in a settlement tank, so that solids are left behind and the liquid effluent is then discharged.
- **Secondary (2°).** Biological treatment, where the effluent trickles through inert materials such as slag, clinker, gravel or more recently, moulded plastic, so that it comes into contact with micro-organisms, which oxidise and clarify the effluent.
- **Tertiary.** A bit of a catch-all expression, usually referring to chemical treatment. Usually concerned with the removal of nutrients such as nitrogen and phosphorous.



- **Advanced treatment and disinfection.** In addition, reverse osmosis membranes are being adopted where space is at a premium. For example, for serving a bathing area directly backing onto cliffs. Treatment can be extended to include further disinfection by exposing the effluent to ultra violet light or ozone prior to its final discharge.

**Sewerage.** The collection and distribution network linking domestic and industrial properties with the sewage treatment system.

**Storm sewer.** A system of pipes (separate from sanitary sewers) that carry only water runoff from building and land surfaces.

**STW.** Sewage treatment works. Sewage effluents are collected at a STW for treatment, with the sewage sludge being separated from water for discharge.

**Supply pipe.** The part of the water distribution network which is on the customer's property and thus usually owned by the customer, not the water supplier. The statutory obligations of water provision companies usually do not extend to the supply pipe.

**Surface water.** All water naturally open to the atmosphere (rivers, lakes, reservoirs, streams, seas, estuaries). It also refers to springs and wells, which are directly influenced by surface water.

**SWC.** The statutory water companies are private sector companies with a statutory obligation to provide water in England and Wales under the 1973 Water Act. Also known as water only companies (WOCs) and are distinct from the Water Plcs.

**TNC.** Transnational Corporation

**TOT.** Transfer, Operate and Transfer. A variant of the BOT contract where extant assets are taken over and operated for a set period of time.

**Trade effluent.** Dilute wastewater (effluent) discharged by industry into the sewerage network. Increasingly subject to restrictions under IPPC whereby it is to be treated separately from domestic sewage.

**Tuck-in.** Acquisitions by a major water company of small water companies within or adjacent to their service area, which are 'tucked-in' or integrated into their networks.

**Turbidity.** Cloudiness caused by the presence of suspended solids in water; an indicator of water quality.

**UFW.** Unaccounted for water. Distribution losses or leakages (q.v.), either expressed as a percentage of water put into the system or in terms of million litres per day (or year). Percentage losses are typically avoided due to their emotive impact. Often also includes illegal abstraction and unmetered supply that has not been billed for.

**UNCHS.** United Nations Centre for Human Settlements (Habitat). Research and aid relating to urban areas.

**UNDP.** United Nations Development Programme

**UNEP.** United Nations Environment Programme.

**USAID.** US direct aid programme for supporting international development projects.

**USEPA.** US Environmental Protection Agency.

**UWWTD.** The EU's 1991 Urban Wastewater Treatment Directive (91/271/EC). All populations of more than 2,000 to have suitable sewage treatment from 2005.

**WASC.** Water and sewerage company, see Water Plc.

**Wastewater.** Typically either sewage (q.v.) or an effluent (q.v.). Water that carries wastes from homes, businesses, and industries. A mixture of water and dissolved or suspended solids.

**Water consumption.** Consumption is the part of a withdrawal of water that is ultimately used and removed from the immediate water environment whether by evaporation, transpiration, incorporation into crops or a product, or other consumption.

**Water contamination.** Impairment of water quality to a degree which reduces the usability of the water for ordinary purposes, or which creates a hazard to public health through poisoning or spread of diseases.

**Water for Life.** The United Nations' Decade for Action launched on World Water Day, 22 March 2005 for meeting the 2015 Millennium Development Goals of halving the number of people without access to improved water supplies and sanitation.

**Water Plc.** Colloquial expression for the ten water and sewerage companies (WASCs) of England and Wales, which were privatised in 1989.

**Water pollution.** Industrial and institutional wastes, and other harmful or objectionable material in sufficient quantities to result in a measurable degradation of the water quality.

**Water quality.** Classification of inland waters. EU classifications range from 'Very Good' (IA) quality waters that have no appreciable indicators of human activities and are capable of supporting more sensitive species such as Brown Trout, to 'Poor' (III) quality waters that support a significantly degraded community of plant and animal species, and 'Bad' (IV) quality waters that (with the exception of some fungi and algae) are usually incapable of supporting life.

**Water use.** Water use is usually defined and measured in terms of withdrawal (q.v.) or consumption (q.v.) that which is taken and that which is used up. Not all water withdrawn is consumed, but is instead returned to a surface or ground water source from a point of use and becomes available for further use.

**Water withdrawal.** Withdrawal refers to water extracted from surface or ground water sources

**WB.** World Bank. Loans targeting services and infrastructure at the pre-privatisation phase. Broad remit to encourage cost recovery and commercialisation.

**WBCSD.** World Business Council for Sustainable Development.

**Wet tonne.** A measure of weight for sewage sludge or industrial effluent. In the case of sewage sludges, this usually refers to material removed from the sewage treatment process. Sewage sludge usually consists of 95-98% water, falling to 75-85% after basic drying. The variability of the water content makes wet tonnes an inconsistent measure of sewage generation, hence the use of dry tonnes when comparing sewage data.

**WFD.** The EU's 2000 Water Framework Directive. Inland waters to be of "good ecological quality" by 2012-15. Calls for cost recovery from 2010 and water management at the river basin level. The expected practical compliance date will be during the third assessment cycle, ending in 2029.

**WHO.** World Health Organisation. Sets Global Standards for drinking water quality, as specified in its 'Guidelines for Drinking-water Quality' (3<sup>rd</sup> edition published in 2004).

**WOC.** See SWC.

**WRI.** World Resources Institute, United States. Independent body researching the use and abuse of natural resources.

**WTW.** Water treatment works render raw (untreated) water potable or fit for human consumption.

**WWC.** World Water Council. Organises the triennial World Water Fora (WWF, q.v.)

**WWF.** World Water Forum. A global gathering of people involved in water issues that as in 2000 has the potential to set the policy agenda or as in 2003 to become mired in polemic. Five have been held to date and the sixth is in preparation: WWF 1; Morocco 1997, WWF 2; The Netherlands 2000, WWF 3; South Africa 2003, WWF 4; Mexico 2006, WWF5; Turkey 2009 and WWF6; Marseilles 2012.

## APPENDIX 4: GLOSSARY OF TERMS AND ABBREVIATIONS

**WWTW.** Wastewater treatment works, another term for sewage treatment works.

**WWV.** The World Water Vision. Drawn up at the Second World Water Forum (see WWF) in 2000, this project envisages universal access to safe water and sanitation by 2025.

**APPENDIX 5:  
REFERENCES AND FURTHER READING**

## APPENDIX 5: REFERENCES AND FURTHER READING

Important sources of country information are included in the relevant country entries. Information on individual companies and privatisation contract awards has been obtained from company annual reports, press releases and web sites, along with analyst briefings and visits since 1989. Copious use of the following periodicals has been made:

- Source Water & Sanitation Weekly (fortnightly)
- The Global Water Report (fortnightly, to October 2006)
- Global Water Intelligence (monthly)
- Asian Water (monthly)

This survey mainly covers secondary sources, reviews and overviews rather than reports on field data and primary academic papers, except where they illustrate particular points or the state of the art at the time. It is a provisional list and in general excludes press releases, internal studies and material solely posted on the Internet.

### General reviews

The country data entries have broadly been based upon the publications below. The exceptions are where other sources are more recent, or where they have provided information not available in these publications.

GEO-3 (2002) Global Environment Outlook 3. UNEP, Earthscan, London, UK

GEO-4 (2007) Global Environment Outlook 4. UNEP, Progress Press, Valetta, Malta

Human Development Report 2003 (2003) Millennium Development Goals: A compact among nations to end human poverty. UNDP, United Nations, New York, USA

Human Development Report 2004 (2004) Cultural Liberty in Today's Diverse World. UNDP, United Nations, New York, USA

Human Development Report 2005 (2005) International cooperation at a crossroads: Aid, trade and security in an unequal world. UNDP, United Nations, New York, USA

Human Development Report 2006 (2006) Beyond scarcity: Power, poverty and the global water crisis. United Nations Development Programme, UNDP, New York, USA

Human Development Report 2007/08 (2007) Fighting climate change: Human solidarity in a divided world. UNDP, United Nations, New York, USA

Human Development Report 2009 (2009) Overcoming barriers: Human mobility and development. UNDP, United Nations, New York, USA

Human Development Report 2010 (2010) 20<sup>th</sup> Anniversary Edition. UNDP, United Nations, New York, USA

OECD Environmental Performance Reviews, OECD, Paris:

- Austria (2003, 2008)
- Australia (2008)
- Belgium (2007)
- Canada (2004)
- Chile (2005)
- China (2007)
- Denmark (2008)
- Finland (2009)
- France (2008)
- Germany (2001)

## APPENDIX 5: REFERENCES AND FURTHER READING

- Greece (2010)
- Hungary (2008)
- Ireland (2000, 2010)
- Italy (2001)
- South Korea (2006)
- Japan (2002, 2010)
- Mexico (2003)
- Netherlands (2003)
- New Zealand (2007)
- Poland (2003)
- Portugal (2001)
- Romania (2008)
- Spain (2004)
- Sweden (2004)
- Switzerland (2007)
- Turkey (2008)
- Ukraine (2008)
- United Kingdom (2002)
- USA (2006)

Sarukhan J. & Whyte A. (2005) Millennium Ecosystem Assessment: MEA Synthesis Report ([www.millenniumassessment.org](http://www.millenniumassessment.org))

Transparency International (2008) Global Corruption Report 2008: Corruption in the Water Sector Cambridge University Press, Cambridge

UNEP (2006) Challenges to International Waters – Regional Assessments in a Global Perspective. United Nations Environment Programme, Nairobi, Kenya.

UN ESA (2009) World Population Prospects: The 2008 Revision; Data Tables and Highlights. Population Division, New York, Department of Economic and Social Affairs, UN Secretariat, UN, NY, USA

UN ESA (2008) World Urbanization Prospects: The 2007 Revision; Data Tables and Highlights. Population Division, New York, Department of Economic and Social Affairs, UN Secretariat, UN, NY, USA

UNCHS Habitat (2007) Enhancing urban safety and security: Global; Report on Human Settlements 2007. United Nations Human Settlements Programme, UN-HABITAT, Earthscan, London

UNCHS Habitat (2006) Meeting development goals in small urban centres: Water and sanitation in the world's cities 2006. United Nations Human Settlements Programme, UN-HABITAT, Earthscan, London

UNCHS Habitat (2003) The Challenge of Slums: Global; Report on Human Settlements 2003. United Nations Human Settlements Programme, UN-HABITAT, Earthscan, London

UNCHS Habitat (2003) Water and Sanitation in the World's Cities: Local Action for Global Goals, Earthscan, London, UK

UNCHS Habitat (2001) Cities in a Globalizing World: Global Report on Human Settlements, 2001. Earthscan, UK.

UNESCO (2003) World Water Development Report - Water for People, Water for Life, United Nations Educational, Scientific and Cultural Organization (UNESCO), Paris, France,

UNESCO (2003) Water a shared responsibility - The United Nations World Water Development Report 2, United Nations Educational, Scientific and Cultural Organization (UNESCO), Paris, France,

## APPENDIX 5: REFERENCES AND FURTHER READING

WWA 1 (2003) Water for People, Water for Life: World Water Assessment Programme, UNESCO / WWAP, Perugia, Italy

WWA 2 (2006) Water, a Shared Responsibility: World Water Assessment Programme, UNESCO / WWAP, Perugia, Italy

WWA 3 (2009) Water in a Changing World: World Water Assessment Programme, UNESCO / WWAP, Perugia, Italy

WHO / UNICEF (2008) Progress on drinking water and sanitation: special focus on sanitation, WHO Geneva

WHO, Global Water Supply and Sanitation Assessment 2000 and WHO (2008) Regional & Global Costs of Attaining the Water Supply and Sanitation Target of the MDGs, WHO, Geneva, Switzerland

WHO / UNICEF (2005) Water for life: making it happen, JMP, Geneva

World Bank (2003) Water Resources Sector Strategy: Strategic Directions for World Bank Engagement, World Bank Washington DC, USA

World Bank (2003) World Development Report, 2004: Making Services Work for Poor People, World Bank, Washington DC, USA

World Development Report 2005 (2004) A Better Investment Climate for Everyone. WRI, UNDP, UNEP, World Bank, OUP, Oxford, UK.

World Development Report 2006 (2005) Equity and Development. WRI, UNDP, UNEP, World Bank, OUP, Oxford, UK.

World Development Report 2007 (2006) Development and the next generation. WRI, UNDP, UNEP, World Bank, OUP, Oxford, UK.

World Development Report 2009 (2008) WDR 2009: Reshaping Economic Geography, World Bank, Washington DC USA

World Development Report 2010 (2010) WDR 2010: Development and Climate Change. World Bank, Washington, USA

World Investment Report (2008) Transnational Corporations and the Infrastructure Challenge, UNCTAD, Geneva

WRI (2003) World Resources, 2002-04: Decisions for the Earth. World Resources Institute, Washington DC, USA

### **Overviews of water provision issues**

ADB (2009) Asian sanitation data book 2008: Achieving sanitation for all. ADB, Manila, Philippines

ADB (2004) Water in Asian Cities, Asian Development Bank, Manila, Philippines

ADB (2007) Water development outlook, Asian Development Bank, Manila, Philippines

AICD (2008) Ebbing Water, Surging Deficits: Urban Water Supply in Sub-Saharan Africa. AICD Background Briefing 12, World Bank / IBRD, Washington, USA

AICD (2009) Provision of Water to the Poor in Africa: Experience with Water Standposts and the Informal Water Sector. AICD Background Briefing 12, World Bank / IBRD, Washington, USA

## APPENDIX 5: REFERENCES AND FURTHER READING

- Eisebreich S.J., ed. (2005) *Climate Change and the European Water Dimension*, EU Report 21553, DG JRC, Italy
- Cairncross S, ed. (2003) *Water & Sanitation in the Worlds Cities: Local Action for Global Goals*. United Nations Human Settlements Programme. UN-HABITAT, Earthscan, London
- Danida (2010) *Reaching the MGD target for sanitation in Africa – a call for rwalism*. Ministry of Foreign Affairs of Denmark, Copenhagen, Denmark
- European Environment Agency (2009) *Water resporces across Europe – confronting water scarcity and drought*. EEA, Copenhagen, Denmark
- Gleick, P.H. & Palanippan M (2010) *Paek water : Conceptual and practical limits to freshwater withdrawal and use*. PNAS.
- Gleick, P.H. et al. (2004) *The World's Water 2004-2005: The Biennial Report on Freshwater Resources*. Island Press, Washington, D.C.
- Gleick, P.H. et al. (2002) *The World's Water 2002-2003: The Biennial Report on Freshwater Resources*. Island Press, Washington, D.C.
- Gleick, P.H. (2000) *The World's Water 2000-2001: The Biennial Report on Freshwater Resources*. Island Press, Washington, DC
- Gleick, P.H. (1998) *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*. Island Press, Washington, DC
- Hutton G & Bartram J (2008), *Global costs of attaining the Millennium Development Goal for water supply and sanitation*, *Bulletin of the World Health Organization*, 2008; 86: 13-19
- IPCC (2007), *Climate Change 2007: Fourth Assessment Report*
- IPCC (2008), *Climate change and water: IPCC Technical Paper IV*
- Kundzewicz, Z.W., L.J. Mata, N.W. Arnell, P. Döll, P. Kabat, B. Jiménez, K.A. Miller, T. Oki, Z. Sen and I.A. Shiklomanov, 2007: *Freshwater resources and their management. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 173-210.
- Le Quesne, T, Pegram, G, & Von Der Heyden, C (2007) *Allocating scarce water. A WWF primer on water allocation, water rights and water markets*. WWF-UK, United Kingdom
- Mcintosh, A. C. (2003) *Asian Water Supplies: Reaching the Urban Poor*. Asian Development Bank / IWA Publishing, London
- OECD (2009) *Managing Water for All: An OECD Perspective on Pricing and Financing*, OECD, Paris, France
- Owen, D A LI (2006) *Financing Water and Wastewater 2006-2025: From Necessity to Sustainability*. Thomson Financial, London, UK
- Owen, D A LI (2009) *Tapping Liquidity: Financing Water and Wastewater 2010-2020*. Thomson Reuters, London, UK
- Pearce F (2006) *When the rivers run dry: What happens when our water runs out?* Eden Project Books, London
- Prüss A , Kay D, Fewtrell L & Bartram J (2002) *Estimating the Burden of Disease from Water, Sanitation, and Hygiene at a Global Level*, *Environmental Health Perspectives*, 110 / 5, 537-542



UNESCO-WWAP (2006) Water a shared responsibility: The United Nations World Water Development Report 2. UNESCO, Paris, France

Water Supply and Sanitation Collaborative Council (2004) Resource Pack on the Water and Sanitation Millennium Development Goals, WSSCC, Geneva, Switzerland

WHO (2000) Global Water Supply and Sanitation Assessment. WHO, UNICEF & WSSCC, USA.

WHO (2004) Guidelines for Drinking-water Quality. Third edition. WHO, Geneva

WHO / UNICEF (2006) Meeting the MDG drinking water and sanitation target: the urban and rural challenge of the decade. WHO, Switzerland

WHO (2008) GLAS: UN-Water Global Annual Assessment of Sanitation and Drinking-Water, WHO, Geneva, Switzerland

WHO (2009) Vision 2030: The resilience of water supply and sanitation in the face of climate change – Technical report. WHO / DFID, Geneva, Switzerland

WHO (2009) Vision 2030: The resilience of water supply and sanitation in the face of climate change – Summary and policy implications. WHO / DFID, Geneva, Switzerland

WHO (2010) GLAAS 2010: UN-Water global annual assessment of sanitation and drinking water. WHO / UN-Water, Geneva, Switzerland

WHO (2010) Progress on sanitation and drinking-water: 2010 update. WHO / UNICEF JMP, Geneva, Switzerland

World Bank (2008) MENA development report: Making the most of scarcity, World Bank, Washington DC, USA

World Bank (2006) Getting Africa on Track to Meet the MDGs on Water and Sanitation: A Status Review of Sixteen African Countries, World Bank, Washington DC, USA

Wouters P (2010) Water Security: Global, regional and local challenges. IPPR, London, UK

WSP (2008) Performance Improvement Planning: Developing Effective Billing and Collection Practices, Water & Sanitation Program, South Asia, New Delhi

WSP (2008) Performance Improvement Planning: Designing an Effective Leakage Reduction and Management Program, Water & Sanitation Program, South Asia, New Delhi

WSP (2008) The Sanitation Business: 100million customers await you! The National Development Planning Agency, Jakarta, Indonesia

WSP (2008) Economic Impacts of Sanitation in Southeast Asia: A four-country study conducted in Cambodia, Indonesia, the Philippines and Vietnam under the Economics of Sanitation Initiative(ESI), The World Bank, Jakarta, Indonesia

WSP (2007) Performance Improvement Planning: Upgrading and Improving Urban Water Services, Water & Sanitation Program, South Asia, New Delhi

WSP (2007) Taking Water and Sanitation Services to the Urban Poor, Water & Sanitation Program, South Asia, New Delhi

### **Water economics and policy**

Ahmed R. (2003) DSK: a model for securing access to water for the urban poor. WaterAid, London, UK

## APPENDIX 5: REFERENCES AND FURTHER READING

Baietti A, Kingdom W & van Ginneken M (2006) Characteristics of well Performing Public Water Utilities. Water Supply & Sanitation Working Notes Note No. 9, May 2006 The World Bank, Washington, DC, USA

Bannister, M (2003) Corruption in development – a killing virus. 29th WEDC International Conference Abuja, Nigeria, 2003. WEDC, Loughborough, UK

BIPE / FP2E (2008) Water and wastewater services in France, 3<sup>rd</sup> Edition, BIPE, Paris, France

le Blanc, D (2007) A Framework for Analyzing Tariffs and Subsidies in Water Provision to Urban Households in Developing Countries. Division for Sustainable Development, United Nations

Briceno C & Foster V (2009) Africa's Infrastructure: A Time for Transformation. Presentation by ACID for the World Bank Water Week 2009, World Bank, Washington DC, USA, February 2009

Briceno C, Smits K & Foster V (2008) Financing Public Infrastructure in Sub-Saharan Africa: Patterns, Issues and Options. Africa Infrastructure Country Diagnostic (ACID) Paper 15, World Bank, Washington DC, USA

Brikké F. & Rojas J. (2001) Key Factors for Sustainable Cost Recovery in the context of community-managed water supply. Occasional Paper Series 32-E, IRC International Water and Sanitation Centre, Delft, The Netherlands

Cardone R & Fonseca C (2006) Financing Facilities for the Water Sector , Thematic Overview Paper 13, IRC International Water and Sanitation Centre, IRC, Delft, The Netherlands,

Chohin-Kuper A et al (2008) Water pricing in Europe and around the Mediterranean Sea: issues and options. Presentation to 4<sup>th</sup> EWA Conference, Brussels, Belgium

Collignon, B & Vezina, M (2000). Independent Water and Sanitation Providers in African Cities. World Bank, Washington DC, USA.

Cosgrove, W J & Rijsbnerman, F R (2000). World Water Vision: Making Water Everybody's Business. WWC, Earthscan, UK. In addition, 18 regional documents were published in 1999.

Dole, D. and Bartlett, I. (2004). Beyond cost recovery: setting user charges for financial, economic, and social goals. (Technical note /ERD-ADB; no. 10). Manila, Philippines, Asian Development Bank.

Dubreuil C (2006) The Right to Water: From concept to implementation World Water Council. 2006.

Elshorst H & O' Leary D (2005) Corruption in the Water Sector: Opportunities for Addressing a Pervasive Problem, Transparency International

Emerton, L & Bos, E (2004) Value: Counting ecosystems as water infrastructure. IUCN, Gland, Switzerland

FAO (2006) Stakeholder-oriented valuation to support water resources management processes Confronting concepts with local practice, FAO Water Report 30, UN, Rome, Italy.

Foster, V and Yepes T (2005) Is Cost Recovery A Feasible Objective for Water and Electricity? A background paper commissioned for the World Bank, and quoted in Fay, M & Morrison M (2005) Infrastructure in Latin America & the Caribbean: Recent Developments and Key Challenges. Volume I: Main Report & Volume II: Annexes, Report No. 32640-LCR, World Bank, Washington DC, USA.

Frankhauser S & Tepic S (2005) Can poor consumers pay for energy and water? EBRD, London

Foxwood, N. and Green, J. (2004). Making every drop count: an assessment of donor progress towards the water and sanitation target. Teddington, UK, Tearfund.

## APPENDIX 5: REFERENCES AND FURTHER READING

- Gunatilake, H, Yang, J-C, Pattanayak, S & van den Berg, C, (2006) Willingness-to-pay and design of water supply and sanitation projects: A case study. ERD Technical Note No 19, ADB, Manila, Philippines
- Hearne, R. R. & Trava, J. L. (1997) Water Markets in Mexico: Opportunities and Constraints. Discussion Paper D 97-01, Environmental Economics Programme, IIED, London
- Hutton, G & Haller, L (2004) Evaluation of the costs and benefits of water and sanitation improvements at the global level. WHO / SDE / WSH. World Health Organization 2004
- IIED (2002) Financing for Sustainable Development. IIED, London.
- Johnstone, N. (1997) Economic Inequality and the Urban Environment: The Case of Water and Sanitation. Discussion Paper D 97-03, Environmental Economics Programme, IIED, London
- Kingdom, B, Liemberger, R & Marin P (2006) The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries How the Private Sector Can Help: A Look at Performance-Based Service Contracting. Water Supply and Sanitation Sector Board Discussion Paper Series, Paper No.8, World Bank, Washington DC, USA
- Komives K, Halpern J, Foster V & Wodon Q (2006) The Distributional Incidence of Residential Water and Electricity Subsidies World Bank Policy Research Working Paper 3878, April 2006 The World Bank, Washington, DC, USA
- Lenton R. (2003) Background Paper of the Taskforce on Water and Sanitation, Millennium Project, UNDP
- Littlefair, K. (1998) Willingness to Pay for Water at the Household Level: Individual Financial Responsibility for Water Consumption, Occasional Paper No. 26, SOAS Water Issues Study Group, University Of London
- Marshall J. et al (2002) Water and Sanitation in Tanzania: Poverty Monitoring for the sector using national surveys. WaterAid, London, UK
- McGranahan, G. et. al. (2001) The Citizens at Risk: From Urban Sanitation to Sustainable Cities, SEI / Earthscan, London UK
- McGranahan, G. (2002) Demand-Side Water Strategies and the Urban Poor, PIE Series No.4, IIED, London
- McIntosh, A. (2003) Asian Water Supplies: Reaching the Urban Poor, Asian Development Bank / International Water Association, London
- Mehta, M. (2004) Meeting the Financing Challenge for Water Supply and Sanitation: Incentives to promote reforms, leverage resources, and improve targeting. The World Bank, Washington DC, USA
- Met Office (2009) Vision 2030: The resilience of water supply and sanitation in the face of climate change - Climate change projection study. Met Office / DFID, Hadley Centre, UK
- Mohajeri M et al (eds) (2003) Aqualibrium: European water management between regulation and competition, European Commission, Directorate 1, Brussels
- Morrison J & Schulte P (2010) Corporate water accounting: An analysis of methods and tool for measuring water use and its implications. Pacific Institute for UNEP and UN Global Compact, Pacific Institute, Oakland, USA
- Nigan A. (1996) 'Sustainable financing of WATSAN' 22<sup>nd</sup> WEDC Conference, WEDC, Loughborough, UK

## APPENDIX 5: REFERENCES AND FURTHER READING

- OECD (2002) Environmental benefits of foreign direct investment: A literature review, OECD Paris, France
- OECD (2003) Financing Strategies for Water and Environmental Infrastructure, OECD Paris, France
- OECD (2003) Aid activities in the water sector 1997-2002, OECD Paris, France
- OECD (2003) Improving Water Management: Recent OECD Experience, OECD, Paris, France
- OECD (2003) Social Issues in the Provision and Pricing of Water Services OECD, Paris, France
- OECD (2006) Cost-Benefit Analysis and the Environment OECD, Paris, France
- OECD (2006) Water: the Experience in OECD Countries OECD, Paris, France
- OECD (2007) Financing water supply and sanitation in ECCA Countries and progress in achieving the water-related MDGs. OECD, Paris, France
- OECD (2009) Managing Water for All: An OECD Perspective on Pricing and Financing, OECD, Paris, France
- OECD (2009) Measuring aid to water and sanitation, OECD-DAC, Paris, France
- Ofwat (2006-9) International comparison of water & sewerage service, 2006, 2007, 2008 and 2009 Reports, Ofwat, Birmingham, UK
- Palmer K, Cockburn M, Storer D & Hulls D (2003) Funding Johannesburg – Beyond the Rhetoric, Delivering the Water and Sanitation Targets Cambridge Economic Policy Associates, Cambridge, UK
- Pieris, M E (1994). Water treatment for high incomes, in 'Affordable Water Supply & Sanitation', 20<sup>th</sup> WEDC Conference, Colombo, Sri Lanka, 1994. WEDC, Loughborough University, UK.
- PricewaterhouseCoopers (2001) Water: a World Financial Issue – A Major Challenge for Sustainable Development in the 21st Century. Sustainable Development Series. Paris, PricewaterhouseCoopers.
- Prüss-Üstün A, Bos R, Gore F, Bartram J. (2008) Safer water, better health: costs, benefits and sustainability of interventions to protect and promote health. World Health Organization, Geneva
- Prynn P. & Sunman H, (2000) 'Getting the water to where it is needed and getting the tariff right' ( Financial Times Energy, Conference, Dublin, November 2000)
- Rijsberman, F (2004) The Water Challenge. Copenhagen Consensus Challenge Paper. Copenhagen Consensus project of the Environmental Assessment Institute, Copenhagen, Denmark.
- Rogers P., Bhatia R, & Huber A. (1998) TEC Background Paper No 2: Water as a Social and Economic Good: how to Put the Principle into Practice. Global Water Partnership, Stockholm
- Rogers P. & Hall A. (2003) TEC Background Paper No 7: Effective Water Governance. Global Water Partnership, Stockholm
- Scatasta M (2010) Pricing Water Resources and Water and Sanitation Services. OECD, Paris, France
- Schwartz, K (2006) Managing Public Water Utilities An assessment of bureaucratic and New Public Management models in the water supply and sanitation sectors in low- and middle-income countries. UNESCO-IHE, Delft, the Netherlands
- SIWI (2005) Making Water a Part of Economic Development: The Economic Benefits of Improved Water Management and Services, SIWI, Stockholm, Sweden

## APPENDIX 5: REFERENCES AND FURTHER READING

- Stockholm International Water Institute (2005). Can International Water Targets be Met without Fighting Corruption? Stockholm World Water Week Seminar, 21 August, 2005. Background for Case Presenters.
- Tearfund (2001) Running on Empty: A call for action to combat the crisis of global water shortages. Tearfund, Teddington, UK
- Tearfund & WaterAid (2002) The Human Waste: A call for action to combat the millions of deaths caused by poor sanitation. Tearfund, Teddington, UK
- Terry G. & Calaguas B (2003) Financing the Millennium Development Goals for domestic water supply and sanitation. WaterAid, London, UK
- Toubkiss J (2006) Costing MDG Target 10 on Water Supply and Sanitation: Comparative Analysis, Obstacles and Recommendations World Water Council. 2006.
- Transparency International / World Bank Institute (2009) Improving Transparency, Integrity, and Accountability in Water Supply and Sanitation. World Bank, Washington, USA
- Tremolet S (2010) Innovative Financing Mechanisms for the Water Sector. OECD, Paris, France
- Tremolet S et al (2010) Financing On-Site Sanitation for the Poor: A Six Country Comparative Review and Analysis. WSP, World Bank, Washington, USA
- Trémolet S. & Hunt C (2006) Taking Account of the Poor in Water Sector Regulation, Water Supply & Sanitation Working Notes, Note No. 11, August 2006 The World Bank, Washington, DC, USA
- Triche T, Requena S & Karuiki M (2006) Engaging local private operators in water supply & sanitation services. Water Supply & Sanitation Working Notes, No 12, December 2006, World Bank, Washington DC, USA
- Tynan N. & Kingdom B. (2003) A Water Scorecard: Setting Performance Targets for Water Utilities. Public policy for the private sector Note 242, World Bank (April 2002): 2
- UNEP (2010) Clearing the waters: A focus on water quality solutions. Pacific Institute for UNEP, Nairobi, Kenya
- UN Human Rights Council (2010) Report of the independent expert on the issue of human rights obligations related to access to safe drinking water and sanitation, Catarina de Albuquerque. UN, General Assembly A/HRC/15/31, 29<sup>th</sup> June 2010, UN, New York, USA
- Van den Berg, C, Pattanayak, S Yang, J-C & Gunatilake H (2006) Getting the Assumptions Right: Private Sector Participation Transaction Design and the Poor in Southwest Sri Lanka. Water Supply and Sanitation Sector Board Discussion Paper Series, Paper No.7, World Bank, Washington DC, USA
- Van Dijk M P (2003) Liberalisation of Drinking Water in Europe and Developing Countries, UNESCO-IHE Institute for Water Education, Delft, The Netherlands
- Van Hofwegen P (2006) Task Force on Financing Water For All: Enhancing access to finance for local governments Financing water for agriculture, Chaired by Angel Gurría, World Water Council. 2006.
- Vives, A, Paris A M Benavides J, Raymond, P D Quiroga D & Marcus J (2006) Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects, IADB, Washington, USA
- WaterAid & Tearfund (2003) New Rules, New Roles: Does PSP benefit the poor? Tearfund, Teddington, UK

## APPENDIX 5: REFERENCES AND FURTHER READING

WaterAid (2006) Bridging the gap: Citizens' Action for accountability in water and sanitation, WaterAid, London

WaterAid (2008) Think local, act local: Effective financing of local governments to provide water and sanitation services, WaterAid, London

WaterAid (2008) Beyond Construction: Use by all, WaterAid, London

WaterAid (2004) The education drain, WaterAid, London

WMO (1992), International Conference on Water and the Environment: Development Issues for the 21<sup>st</sup> Century: The Dublin Statement and Report of the Conference, World Meteorological Organization, Geneva

Winpenny J. (2003) 'Financing water for all. Report of the World Panel Financing Water Infrastructure, Chaired by Michael Camdessus' Global Water Partnership / World Water Council / 3<sup>rd</sup> World Water Forum

World Bank (2005) Water Supply and Sanitation Lending: Volume Rises, Quality Remains High Water Supply and Sanitation Feature Story The World Bank, Washington, DC, USA

World Bank (2010) An Evaluation of World Bank Support, 1997-2007: Water and Development, Vol 1 & 2, World Bank, Washington, USA

World Bank (2009) Water and Climate Change: Understanding the Risks and Making Climate-Smart Investment Decisions. World Bank, Washington, USA

World Business Council for Sustainable Development (2006) Business in the world of water: WBCSD Water Scenarios to 2025

WSP (2009) Water Utilities in Africa: Case Studies of Transformation and Market Access. World Bank WSP / PPIAF, World Bank, Washington, USA

WSP (2009) How Can Reforming African Water Utilities Tap Local Financial Markets? World Bank WSP / PPIAF, World Bank, Washington, USA

Zabel T (2002) Pricing Mechanisms in the Water Sector in Selected OECD Countries, in Promoting Environmentally Sustainable Development in Asia, OECD Emerging Asian Economies Programme, OECD Paris

### **History of water provision issues**

Allan, J.A. (2001) The Middle East Water Question: Hydropolitics and the Global Economy. I B Tauris, London

Barty-King, H (1992). Water, The Book. WSA, London.

Cosgrove W.J. (2003) Water Security and Peace: A Synthesis of Studies Prepared under the PCCP-Water for Peace Process, UNESCO IHP PCCP Series No 29, Montreal, Canada

De Villiers M (1999). Water Wars. Weidenfeld & Nicholson, London.

Hassan F.F., et al (2001) History and Future of Shared Water Resources, UNESCO IHP PCCP Series No 6, Montreal, Canada

Jacobson, Charles D., and Joel A. Tarr. 1996. "No Single Path: Ownership and Financing of Infrastructure in the 19th and 20th Centuries." In Ashoka Mody, ed., *Infrastructure Delivery: Private Initiative and the Public Good*. Washington D.C. World Bank.

Tynan, Nicola. 2002. "London's Private Water Supply, 1582-1902." In Paul Seidenstat, David Haarmeyer, and Simon Hakim, eds., *Reinventing Water and Wastewater Systems: Global Lessons for Improving Management*. New York: John Wiley and Sons, Inc.

**Private sector participation and water**

Bakker K (2003) *An Uncooperative Commodity: Privatizing Water in England and Wales*, OUP, Oxford, UK

Balen M (2006) *Water for Life: The case for private investment and management in developing country water systems*. Globalisation Institute, London UK.

Banco Interamericano de Desarrollo (2007) *Salida de operadores privados internacionales de agua en América Latina*, IADB, Washington DC

Berg C. van den (2000) *Water Concessions: Who Wins, Who Loses, and What To Do About It*, Public Policy for the Private Sector Note 217, World Bank, Washington DC, USA

Bitran G.A. & Valenzuela, E.P. (2003) 'Public Services in Chile: Comparing Private and Public Performance'. Public Policy for the Private Sector Note 255, World Bank, Washington DC, USA

Budds, J. & McGranahan, G. (2003) *Privatization and the provision of urban water and sanitation in Africa, Asia and Latin America*. Human Settlements Discussion Paper Series. Theme: Water-1. IIED, London.

Castro J P (2006) *Water Services in Latin America: Public or Private? (Discussion of Four Case Studies)*. MSc Thesis, Erasmus University, Rotterdam

Chenoweth J & Bird J ed. (2005) *The business of water and sustainable development*, Greenleaf, Sheffield, UK

Cowen P.B. & Tynan N. (1999) 'Reaching the Urban Poor with Private Infrastructure' Public Policy for the Private Sector Note 188, World Bank, Washington DC, USA

Dalton G. (2001) 'Private sector finance for water sector infrastructure: what does Cochabamba tell us about using this instrument?' Water Issues Study Group, School of Oriental and African Studies (SOAS), University of London (Occasional Paper No 37, 2001)

Elhadj, E (2001a) *Islamic Finance to Aid Water Utilities*, Occasional Paper No. 36, SOAS Water Issues Study Group, University Of London

Elhadj, E (2001b) *Financing Major Water Projects in the Poorest Economies*, Occasional Paper No. 36, SOAS Water Issues Study Group, University Of London

Europe Economics (2003) *Scope for Efficiency Improvement in the Water and Sewerage Industries*. Europe Economics, London

Fellows W. et al (2003) *Reforming the Nigerian Water and Sanitation Sector*. 29th WEDC International Conference Abuja, Nigeria, 2003. WEDC, Loughborough, UK

Finger, M. & Allouche J. (2001) *Water Privatisation*, Spon Press, UK.

Franceys, R (1997). *Private Sector Participation in Water and Sanitation Services*. Water Resources Occasional Paper No. 3, WEDC, Loughborough University, UK.

Galiani S., Gertler P. & Schargrotsky E. (2002) *Water for Life: The Impact of the Privatisation of Water Services on Child Mortality*, Stanford Institute for Economic Policy Research, Stanford University, USA

## APPENDIX 5: REFERENCES AND FURTHER READING

- Gassner, K Popov A & Pushak N (2009) Does Private Sector Participation Improve Performance in Electricity and Water Distribution? Trends and policy options No 6, The World Bank, Washington DC, USA
- GINNEKEN, M. van, TYLER, R. & TAGG, D. (2004) Can the Principles of Franchising be used to Improve Water Supply and Sanitation Services? – A Preliminary Analysis. World Bank Water Supply and Sanitation Sector Board Discussion Paper Series, No 2
- Gomez-Lobo A., Foster V. & Halpern, J. (2000) Infrastructure Reform, Better Subsidies, and the Information Deficit, Public policy for the private sector Note 212, World Bank (June 2000)
- Green J (ed) (2001) Community participation in urban water services. Tearfund, Teddington, UK
- Guash, J.L., Laffont, J-J. & Straub. S. (2003) Regulation of Concession Contracts in Latin America, World Bank Discussion Paper, Washington DC, USA
- Guasch J L, Laffont, J J & Straub S (2005) Infrastructure Concessions in Latin America: Government-led Renegotiations World Bank Policy Research Working Paper 3749, October 2005 The World Bank, Washington, DC, USA
- GWP (2000) TEC Background Paper No 4: Integrated Water Resources Management. Global Water Partnership, Stockholm
- GWP (2003) TEC Background Paper No 8: Poverty Reduction and IWRM. Global Water Partnership, Stockholm
- Haarmeyer, D. & Mody, A. (1998) Worldwide Water Privatisation, Financial Times Energy, London
- Harris, C., Hodges, J., Schur M. & Shukla P. (2003) 'Infrastructure Projects: A Review of Cancelled Private Projects' Public policy for the private sector Note 252, World Bank (January 2003)
- Harris, C., Hodges, J., Schur M. & Shukla P. (2003) 'Infrastructure Projects: A Review of Cancelled Private Projects' Public policy for the private sector Note 252, World Bank (January 2003): 4.
- IADB (2006) Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects, IADB, Washington DC
- Johnstone, N. & Wood, J. (2001). Private Firms and Public Water, IEED, London, UK
- Johnstone, Nick and Libby Wood (2000), 'Private Sector Participation in Water and Sanitation: Realising Social and Environmental Objectives in Developing Countries', Edward Elgar (forthcoming)
- Kauffmann C (2009) Private Participation in Water Infrastructure: OECD Checklist for Public Action, OECD, Paris, France
- Kessides, I. N. (2004) Reforming Infrastructure: Privatization, Regulation and Competition, World Bank, Washington DC, USA / Oxford University Press, UK
- Komives K. & Prokopy L. S. (2000) Cost Recovery in Partnership: Results, Attitudes, Lessons and Strategies. Business Partners for Development, London, UK
- Lauber, W (2006) Privatisierung des Wassersektors in Europa: Reformbedarf oder Kapitalinteressen? Österreichischer Städtebund, Vienna, Austria
- Lee, S (2007), Water and Development in China, Studies on Contemporary China Vol. 6, World Scientific, Singapore
- Lovei, M & Gentry, B S (2002). Implications of Privatization: Lessons for Developing Countries. World Bank Discussion Paper 426, The World Bank Washington, D.C. USA.



## APPENDIX 5: REFERENCES AND FURTHER READING

- Marin (2009) Public-Private Partnerships for Urban Water Utilities: A Review of Experiences in Developing Countries World Bank, Washington DC, USA
- Mohajeri. S et al (2003) Aqualibrium: European Water Management between Regulation and Competition. EU, DG I, Brussels, Belgium.
- Moore P. & Urquhart P. (2004) Global Water Scoping Process
- OECD (2000) Global trends in urban water supply and waste water finance and management: changing roles for the public and private sectors, OECD, Paris
- Ononski K (2006) The Water Revolution: Practical Solutions to Water Scarcity, International Policy Press, London
- Plummer, J. (2002) Focussing Partnerships: A Sourcebook for Municipal Capacity Building in Public-Private Partnerships, Earthscan, London, UK
- PPIAF (2002) Private Infrastructure: A Review of Projects with Private Participation, 1990-2000. Public Policy for the Private Sector Note 246, World Bank, Washington DC, USA
- Rees J. A. (1998) TEC Background Paper No 1: Regulation and Private participation in the Water and Sanitation. Global Water Partnership, Stockholm
- Rees J. A. (2002) TEC Background Paper No 6: Risk and Integrated Water Resources Management. Global Water Partnership, Stockholm
- Riskong K, Hammond M E & Locussol (2007) Using management and lease-affermarge contracts for water supply: How effective are they in improving water supply? Gridlines 12, The World Bank, Washington DC
- Rivera, D. (1996) 'Private Sector Participation in Water Supply and Sanitation: Lessons from Six Developing Countries', World Bank, Directions in Development, Washington DC, USA
- Sohail M. ed. (2002) 'Public Private Partnerships and the Poor' 8 papers, WEDC, Loughborough, UK
- Solo, T. M. (2003) Independent Water Entrepreneurs in Latin America: The other private sector in water services. World Bank, Biblos, Lima, Peru
- Tremolet, S. (2003) Rural Water Service: Is a Private National Operator a Viable Business Model? Public Policy for the Private Sector Note 249, World Bank, Washington DC, USA
- Tynan N. (2000) 'Private sector participation in infrastructure and the poor: Water and sanitation' Infrastructure for Development: Private Solutions and the Poor, London, UK
- Tynan N. & Kingdom B. (2003) A Water Scorecard: Setting Performance Targets for Water Utilities. Public policy for the private sector Note 242, World Bank (April 2002): 2
- World Bank (2002) Water Supply and Sanitation in PRSP Initiatives: A Desk Review of Emerging Experience in Sub-Saharan Africa (SSA). World Bank, Washington DC, USA
- World Bank (2004) East Asia & Pacific Private Investors in Infrastructure: Perception Survey. World Bank, Washington DC, USA
- World Bank (2006) Approaches to Private Participation in Water Services: A Toolkit. The World Bank, Washington, DC, USA
- World Bank (2006) The challenge of reducing non-revenue water in developing countries: How the private sector can help – A look at performance-based service contracting. The World Bank, Washington, DC, USA

World Bank (2010) Water operators from emerging markets: New players for public-private partnerships. Gridlines, 56, World Bank, Washington, USA

World Bank (2010) Corporatizing a water utility: A successful case using a performance-based contract for ONEA in Burkina Faso. Gridlines, 53, World Bank, Washington, USA

WBSCD (2005) Collaborative actions for sustainable water management. The role business can play as an active stakeholder in collaborative processes for water management. World Business Council for Sustainable Development, Geneva, Switzerland

WBSCD (2006) Business in the world of water: WBCSD Water Scenarios to 2025. World Business Council for Sustainable Development, Geneva, Switzerland

WEF (2009) The Bubble Is Close to Bursting. World Economic Forum Water Initiative, WEF, Davos, Switzerland

WWC (2004) Proceedings of the Workshop on Water & Politics: Understanding the Role of Politics in Water Management, Marseille, February 26-27, 2004

### **Water resources**

Alghariani, S. A. (2003) Water Transfer versus Desalination in North Africa: Sustainability and Cost Comparison. Occasional Paper No. 49, SOAS Water Issues Study Group, University Of London

Allan, J.A. (2003) Virtual Water - The Water, Food, and Trade Nexus Useful Concept or Misleading Metaphor? IWRA, Water International, Volume 28, Number 1

Bates, B.C., Z.W. Kundzewicz, S. Wu and J.P. Palutikof, Eds., (2008) Climate Change and Water. Technical Paper of the Intergovernmental Panel on Climate Change, IPCC Secretariat, Geneva

Fisher FM & Huber-Lee A (2005) Liquid Asseys: An economic approach for water management and conflict resolution in the Middle East and beyond. Resources for the Future, Washington DC, USA

Gleick, P. H. (2000) The changing water paradigm: A look at twenty-first century water resources development. Water International, Vol. 25, No. 1, pp. 127-138.

JHU (1998) Solutions for a Water-Short World, Population Information Program, John Hopkins University, USA

Merrett, S. (2003a) Virtual Water and the Kyoto Consensus: A Water Forum Contribution. International Water Resources Association, Water International, Volume 28, Number 4, Pages 540–542

Merrett, S. (2003b) 'Virtual Water' and Occam's Razor. Occasional Paper No. 62, SOAS Water Issues Study Group, University Of London

Serageldin, I (1994). Water Supply, Sanitation and Environmental Sustainability: The Financing Challenge. IBRD/World Bank, USA.

### **Corporate approaches towards water provision**

This is, to the author's best knowledge, a comprehensive listing of English-language stand-alone corporate publications addressing the need for the private sector to play a role in extending water and sanitation services.

Aquafed (2007a) Practitioners' Views on the Right to Water, Aquafed, Brussels, Belgium

Aquafed (2007b) 2005-2008 Progress on CSD13 decisions on water and sanitation – Perception of Private Water Operators. Aquafed, Brussels, Belgium

Lyonnais des Eaux (1998) *Alternative Solutions for Water Supply and Sanitation in Sectors with Limited Financial Resources*, Lyonnais des Eaux, Paris

Suez (2002) *Bridging the Water Divide*, Suez Ondeo, Paris

Suez (2006) *Water for All*, Suez Environnement, Paris

Suez (2007) *Human Rights and Access to Drinking Water and Sanitation. Contribution to OHCHR Consultation*, Suez, Paris

Thames Water (2002) 'Planet Water' 1<sup>st</sup> edition, Thames Water Plc, Reading UK.

Thames Water (2003) 'Planet Water' 2<sup>nd</sup> edition, Thames Water Plc, Reading UK.

Veolia (2007) *The right to water: from concept to effective implementation*, Veolia Environnement, Paris

WEF (2008) *World Economic Forum Water Initiative Realizing the Potential of Public-Private Partnership Projects in Water*, Davos, Switzerland

### **Critiques of PSP and water**

This is a selection of the more influential books, publications and papers either highlighting areas which the private sector needs to address or by the outright opposition of the use of private sector finance and management. With one illustrative exception, publications which include exclamation marks in their titles have been omitted.

Recent research initiatives looking at European water provision from a historic perspective (WaterTime, sponsored by the European Union) and Latin America and Africa (Prinwass – Barriers to and conditions for the involvement of private capital and enterprise in water supply and sanitation in Latin America and Africa: Seeking economic, social, and environmental sustainability) highlight an informed critical engagement with PSP by the academic community in general.

Barlow M. & Clarke T. (2002). *Blue Gold: The Fight to Stop the Corporate Theft of the World's Water*. The New Press, NY, USA.

Barlow M (2007) *Blue Covenant: The Fight for Water as a Human Right*. McClelland & Stewart, Toronto, Canada

Brennan B., et al (2004) *Reclaiming Public Water! Participatory alternatives to privatization*, TNI Briefing Series 2004/7, TNI, Amsterdam, The Netherlands

Consumers International (2004) *Water Works: A consumer advocacy guide to water & sanitation*, CI, London

Food & Water Watch (2006) *Faulty Pipes: Why Public Funding – Not Privatization – is the Answer for U.S. Water Systems*. Food & Water Watch, Washington DC, USA

Foxwood, N. and Green, J. (2004) *Making every drop count: an assessment of donor progress towards the water and sanitation target*. Teddington, UK, Tearfund, 72 p

Gleick P. H. et al. (2002) *The New Economy of Water: The Risks and Benefits of Globalization and Privatization of Fresh Water*. Pacific Institute, Oakland, California

Hall, D. (1999) *Privatization, Multinationals and Corruption*, *Development in Practice* 9 (5)

Hall, D. (2004) *Water Finance – A Discussion Note*. PSIRU, University of Greenwich, UK

Hall, D., Lobina, E. & de la Motte, R. (2003) *Public solutions for private problems? Responding to the shortfall in water infrastructure investment*, PSIRU, University of Greenwich, UK

## APPENDIX 5: REFERENCES AND FURTHER READING

Hall, D. & Lobina, E. (2006) Pipe dreams: The failure of the private sector to invest in water services in developing countries. World Development Movement / PSIRU, London, UK

Hall, D. & Lobina, E. (2007) Water as a public service. PSIRU, Business School, University of Greenwich

Hall, D., & de la Motte, R. (2004) Dogmatic Development: Privatisation and conditionalities in six countries. PSIRU / War on Want, PSIRU, University of Greenwich, UK

Hukka, J.J. and Katko, T.S. (2003) Water privatisation revisited: panacea or pancake? (Occasional paper series; no. 33-E) Delft, The Netherlands: IRC International Water and Sanitation Centre.

Lobina, E. (2003) Problems with private water concessions: a review of experience. PSIRU, University of Greenwich, UK

Lobina, E. & Hall, D. (2003) Water privatisation and restructuring in Latin America, 2007. PSIRU, Business School, University of Greenwich

Hasan, S. (2001) The Privatisation Process of Water and Sewerage Services in an Asian Metropolis: Global Politics, Organisations and Local Poor; a Case Study of Karachi Occasional Paper No. 34, SOAS Water Issues Study Group, University Of London

Oxfam (2006) In the Public Interest: Health, Education, Water and Sanitation for all. Oxfam/WaterAid, Oxford, UK

Wagner J. M. et al. (2003) Human Rights and the Environment. Earthjustice, Oakland, California

WaterAid Tanzania (2002) Water utility reform and private sector participation in Dar es Salaam, WaterAid and Tearfund, London