Water targeted as part of Greek national reforms

The Greek government has targeted the water sector as part of its drive to help put the country’s finances on a more secure footing, aiming to raise funds from the part sale of its stakes in the country’s two main water utilities. The move comes at a time when the government has also set out plans to rationalise public administration across the country, and is reducing subsidies to the water sector.

The plans announced by the Greek Ministry of Finance at the start of June include the sale of a 10% stake in EYDAP, the water utility of Athens, and the sale of a 23% stake in EYATH, the water utility of Thessaloniki. The State currently owns 61% of EYDAP and 74% of EYATH, so the intention is that the sales will still leave a 51% State holding in each case.

The moves to secure funds from the private sector come at a time when the Greek government is planning a major overhaul of the country’s public administration under the so-called Kalikratis plan for local government. Under this, the intention is to replace more than 70 prefectures with 13 regions and cut back the number of municipalities from over 1000 to less than 370 by the start of next year, and to cut to around one third the some 6000 legal entities and municipal corporations.

Of a national population of around 11 million, EYDAP and EYATH supply water to some four million and one million respectively. A further four million are supplied by around 230 municipally-owned companies. It is estimated that under the Kalikratis plan the number of such companies will be reduced to around 140. (See Analysis, page 6)

Cascal applies for preliminary relief from Sembcorp bid

In the fast-moving story of utility group Sembcorp’s attempted purchase of Netherlands-based water and wastewater services provider Cascal, the latter has filed an application with the Amsterdam court of appeals for preliminary relief to protect the interests of its minority shareholders.

A hearing was scheduled for 10 June, but the company had not announced the result of this bid as WUMI went to press. The offer expired on 21 June. At the same time as its bid to stall the takeover in the Dutch courts, the company made a further filing unani mously recommending that stockholders other than Biwater reject the offer.

This filing says that Cascal’s board of directors ‘believes that Biwater agreed to sell the Biwater stake as a result of Biwater’s significant financial distress due to pressure exerted by its principal lender HSBC, which also acted as its financial advisor in negotiating the sale to Sembcorp.’

Biwater agreed the sale of its 17.8 million shares (a 58.4% stake in Cascal) to Sembcorp back in late May. At the time Sembcorp group president Tang Kin Fei said that the company was ‘excited’ about the growth prospects that Cascal brought to Sembcorp.

The Cascal board statement stressed that it was committed to exploring strategic alternatives to maximise shareholder value of the shares, including seeking a superior alternative to Sembcorp’s offer ‘which may include a business combination of the company with third parties or other strategic or financial alternatives that could deliver higher stockholder value than the offer.’

Sembcorp and its parent had filed a tender offer for all of Cascal’s outstanding common shares for an offer price of $6.75 per share if at least 80% of the issue and outstanding shares were tendered and not withdrawn, and a price of $6.40 per share if that condition is not satisfied.

In early June, a class action was filed in the New York Southern District court on behalf of all Cascal shareholders alleging that Sembcorp ‘failed to disclose material information in tender offer materials filed with the SEC (Securities and Exchange Commission) and publicly disseminate in connection with the tender offer by Sembcorp for Cascal.’

The complaint says the materials were ‘materi ally false and misleading because they included only a summary of one set of financial projections and failed to disclose, inter alia, whether the summary of projections was relied on by Sembcorp and/or its financial advisor in developing the terms of the tender offer, and whether the summary was supported or not supported by other company financial information made available to Sembcorp.’

The latest news is that Cascal has announced that it has obtained a new loan facility from Australia’s Macquarie Bank. The facility is for £55 million ($81 million) and will mature in June 2015. The term loan facility replaces an existing $60 million revolving loan facility and $10 million guarantee facility with HSBC, which was due to expire in June 2011. The company will use funds from the new loan to fully retire the outstanding $58 million balance on the existing facility.

(See Analysis, page 6)
World Bank offers climate change insights

The World Bank recently issued a report ‘Climate change and urban water utilities: challenges and opportunities’, which stresses that the impact of climate change is becoming increasingly important to the design of infrastructure investment programmes.

The report, the 24th in its series of water working notes, notes that ‘growing evidence indicates that the water sector will not only be affected by climate change, but that it will deliver many of its impacts through floods, droughts or extreme rainfall events. Water resources will change in both quantity and quality, and water, stormwater and wastewater facilities’ infrastructure will face greater risk of damage caused by storms, floods and droughts.’

Climate change effects will manifest in a range of ways from operational difficulties to disrupted services and increased costs for these services, the report adds.

Mott MacDonald leads Botswana service reform

Mott MacDonald and Merz and McLellan Botswana, which is now part of the Mott MacDonald Group, have been appointed by Botswana’s Ministry of Minerals, Energy and Water Resources as lead consultant on a consortium that will help to establish a new energy and water regulatory agency in Gabarone.

The other members of the consortium are Cameron McKenna and Collins Newman & Co.

The government of Botswana is reforming and restructuring its energy, water and sanitation sectors and wants greater private sector participation in procuring and operating infrastructure in the water and power sectors. This requires an independent regulatory authority to leverage private sector support.

The Mott MacDonald and Merz and McLellan’s team will work with colleagues on the consortium to develop a regulatory framework and legislation to cover all operational, organisational and governance procedures for the newly-established authority. The team will also help the client to recruit new core staff and provide training to help build their knowledge and enhance the capacity of the new authority.

Manila Water forms subsidiary holding for overseas operations

Manila Water, the Ayala-owned concessionaire company for the east zone of Metro Manila, has formed a subsidiary holding company in Singapore to take care of its overseas operations.

In its disclosure to the Philippines stock exchange, Manila Water said the incorporation of Manila Water Asia Pacific was in line with its expansion programme in the Asia-Pacific region.

The company currently has $15 million worth of leakage reduction and management services projects in Ho Chi Minh city, Vietnam and has said it is looking to bid for water projects in India, China and Indonesia.

The company recently partnered with Indian company Jindal Water Infrastructure to explore water and wastewater projects in the three western Indian states of Rajasthan, Gujarat and Maharashtra. Manila Water’s 2009 net income was P3.2 billion ($69.5 million), 15.8% up on 2008.

The company also connected an additional 54,000 households to its network last year and reduced non-revenue water from 19.7% to 15.8%.

The company was ‘very bullish’ about its growth prospects in Asia. He noted: ‘In the past 13 years, Manila Water has developed a skill set that will make us competitive in selected Asian markets.’
The European Commission (EC) has issued a second follow-up report to the European Union (EU) on the progress of member states in addressing water scarcity and droughts, which warns that some states have begun to suffer from a permanent state of water scarcity.

The report says an effective water pricing policy, greater water efficiency and water saving measures are ‘essential’ to ensure that Europe has sufficient good quality water to meet both user needs and the challenges of climate change.

The latest annual report shows that some member states have begun to suffer permanent scarcity across the whole country. The problem is not limited to Mediterranean countries – the Czech Republic has reported areas with frequent water scarcity, and France and Belgium have reported over-exploited aquifers. Mediterranean countries are suffering badly, with Spain and Italy reporting permanent drought across whole river basins and Malta and Cyprus reporting permanent drought across the entire country.

The EC has urged member states to adopt policies such as water pricing, improved water management tools and efficiency and water saving measure for some years.

The new report confirms that good water management should be based on the water hierarchy, with priority given to water demand management. Supply options should only be considered once the potential for water savings has been exhausted, it observes.

The report warns that the tourism sector needs attention as most tourists go to areas where water scarcity and droughts are already problematic and use on average four times as much water as local residents. ‘Peak season demands can therefore put severe constraints on local supply,’ the report says. ‘A key challenge is to reduce water demand in the peak season and minimise resource use to reduce the ecological footprint and stress on water.’

EU Environment Commissioner Janez Potočnik said: ‘Water is life – so water policy is our life insurance. This report highlights the importance of integrating water policy into wider policy goals at all levels, at EU and national levels. More than anything else, our water policies must be sustainable: we cannot afford to borrow water from the future.’

Most countries in sub-Saharan Africa are seeking long-term solutions to their water financing hiccups, with some reporting major shifts towards reforming their tariff and billing structures.

Water tariffs, a key source of revenue for the continent’s water service providers, some countries now believe will not only turn around the revenue streams for the providers but will also attract private investors in the water sector.

Tanzania and Rwanda have set in motion processes that would see the billing system and tariff structures revolutionised to ensure sustainable water revenue streams, and accommodate the poor who cannot pay for the water they consume.

In Tanzania, President Jakaya Kikwete’s government is struggling to eliminate incidents of poor revenue collection and incidents of fraud in the 20 urban and 132 rural water service providers by reviewing the weaknesses of the current water billing system with possible amendments to make it easier for consumers to pay.

In March, both regional and urban water authorities took a bold step of embracing new automatic pre-paid water meters meant to reduce water revenue losses attributed to unpaid water bills. Enerweb East Ltd, the company that imported and installed the water meters, said the equipment ‘will enable customers to settle their bills in advance’.

‘Most water users complain about irrational and inflated water bills, but the meters can address all these complaints as no water would be lost while on way and even water authorities would now be able to collect revenues [and] use the money in improving water services,’ said Mr Gaston Meltus Francis, the company’s Managing Director. Authorities in neighbouring Rwanda, east Africa’s fastest emerging economy, have set in motion a process of re-working the country’s water tariff structures with a view to attracting private sector investment in the water sector. Rwanda Water and Sanitation Corporation (RWASCO), charged with the responsibility of production and distribution of water in the country, has subsequently floated an international tender seeking to contract a reputable consultancy firm to carry out an assessment of the existing water tariff structure, as the country steps up the hunt for private investors to inject the much needed funding into the water sector.

The successful bidder will specifically assess and recommend tariff structures and billing systems that would be attractive to potential investors, and encourage customers towards appreciating the necessity of paying for the water supply.

‘Assessment of the current and future opportunities of water tariff systems and making recommendations for water tariff and billing / collection systems, including identifying specific circumstances where operating subsidies would be required, are some of the focused activities of the water tariff review,’ said Yves Muyange, Acting Managing Director of RWASCO.

A new water tariff structure would further enable Rwanda, where 60 percent of the population lives below the poverty line, achieve projected increased water and sanitation of 85 percent and 65 percent respectively by the end of 2015.

Stable utility prospects in face of currency devaluation

European utilities face mixed but generally stable prospects should their home currencies be devalued, according to research from UK-based analysts Execution Noble.

Given uncertainty over what the future holds for the Euro in particular, the likely impact of a 20% weakening of the Euro and of UK Sterling was assessed for some of Europe’s major utilities. Whilst focusing on the power sector, these included prominent players with water interests – RWE, Suez Environment and Veolia.

The research looked at key financial parameters, including companies’ foreign debt, foreign earnings, foreign capital, and debt / equity ratio. It assessed the possible impact of a 20% depreciation of companies’ respective home currency. The net impact of an increase in financial expenses and foreign earnings on group earnings was found on average to be a 2% improvement in earnings, ranging from 8% to -0.7% (Veolia 3.2% and Suez Env 2.5%, RWE -0.7%).

The research states: ‘For the majority of stocks, depreciation of their home currency would have a mild positive effect on EBIT (earnings before interest and taxes), measured as the impact of an increase in foreign EBIT, partly offset by higher financial costs related to the servicing of foreign debt... Only Fortum and RWE would suffer marginal net earnings decreases of c1% of EBIT.’

Generally the debt / equity ratio would worsen, increasing on average by 0.08 (RWE 0.15, Veolia 0.11, Suez 0.22 – three of the four worst affected of the ten utilities assessed). The research states: ‘There are no significant risks to gearing (net debt / equity) under the balance sheet stress test. In most cases the combined FX (foreign exchange) effects of revaluation debt and assets plus the variation of EBIT have a small negative impact on gearing.’

The research concludes: ‘In our universe, utilities are generally well protected against a scenario of a 20% depreciation of both the Euro and GBP. There is an average 2% improvement to EBIT. Balance sheets suffer mildly, with RWE, E.ON and SEV most affected. Dividends are not at risk.’

WATER UTILITY MANAGEMENT INTERNATIONAL • JUNE 2010 • 3
Suez Environnement signs tranche of contracts across South America

Suez Environnement, through its Agbar, Degrémont and Ondeo Industrial Solutions subsidiaries, has signed a tranche of contracts to design, build and operate waste-water treatment plants in Chile, Panama and Brazil worth €390 million ($480 million).

An Agbar and Degrémont consortium has signed a €260 million ($320 million) contract with Aguas Andinas in Chile to extend and then operate for five years the Mapocho wastewater treatment plant in Santiago valley, and modernize the facility to ensure energy recovery from sludge.

In consortium with Odebrecht, one of Brazil’s largest builders, Degrémont has signed a contract with the Panama Ministry of Health to design, build and operate for four years an urban wastewater treatment plant for the capital worth a total of €170 million ($209 million), including €80 million ($99 million) in sales for Degrémont.

Degrémont and Ondeo Industrial Solutions have signed an agreement with the EGESA-TK consortium, which is building the 12th Petrobras refinery in north-west Brazil, to design and build a treatment and recycling plant for residual process water from the new installation. The total turnover of this contract will be €97 million ($120 million), including €49 million ($60 million) membrane bioreactor (MBR) for the partners.

The facility will use a pretreatment unit and MBR to produce demineralised water for the site. Degrémont has recently won several process water treatment contracts with Petrobras across Brazil.

CDM in to develop Jordan infrastructure master plan

Design and construction firm CDM has been chosen by the United States Agency for International Development (USAID) to develop a comprehensive water and wastewater infrastructure master plan and design, and to deliver water and wastewater infrastructure improvements in Jordan.

The five-year, multi-site investment project will provide urgently-needed system improvements and better water resources management over the next 25 years in Amman, Zarqa, Ma’an, Tafila and Jerash.

The company will work with the Water Authority of Jordan (WAJ) and other stakeholders to focus programme efforts on developing water and wastewater master plans and feasibility studies.

It will also identify cost recovery opportunities to guide the design of new and upgraded facilities to meet effluent reuse standards, and will train WAJ staff to maintain the system improvements.

The project will be the sole contract for funding all USAID-funded water and sanitation design and construction work in the country over the next five years.

CDM previously managed another USAID project in Jordan, a four-year multi-phase water quality management initiative that finished in 2006. The aim of this was to improve stewardship of water resources and protect public health and the environment.

The initiative was a short-term holistic analysis of the country’s water resources to strengthen institutional capacity and inter-agency relationships, with a second phase that included a pilot project to institutionalise watershed protection in the Jerash Governorate and develop a series of best management practices.

Business

KUWAIT: Significant investment needed to improve Kuwait’s supplies

Local press have reported that Kuwait is going to have to spend an estimated $85 billion by 2019 to enhance its electricity and water production capabilities. A source claimed the country’s energy sector will require around $20 billion for desalination, without adding the costs for replacing ageing equipment, and that population increases and industrial expansion will drive water demand upwards. It is estimated that desalination production will increase by 70% to 4.4MGD (19.8MLD) by 2019.

US: American States water company sells Chaparral City shares

The American States water company has agreed to sell all of the common shares of Chaparral City water company, a wholly-owned subsidiary in Arizona, to Epcor Water (USA) for an estimated total price of $35 million, which includes assuming around $6 million of long-term debt. Chaparral serves over 13,000 customers in the town of Fountain Hills, Arizona, and part of the city of Scottsdale. Epcor builds, owns and operates water and wastewater treatment facilities and electric transmission and distribution networks. It provides water and wastewater services to over a million people in more than 70 communities in western Canada.

INDONESIA: Jakarta water company hikes up tariffs

Jakarta’s private water company PT Aetra Air has announced massive rate increases for 3000 of its customers in areas with high water pressure. Aetra’s corporate secretary Yosua L Tobing said the company was basing its new rates on a survey of 7000 customers that assessed property types and development in its areas. He added that 75 customers would see their rates drop. The rest would have their status changed from a subsidised rate of $0.11/10m3 to $0.34/10m3.

 BRAZIL: Sabesp signs reuse contract with Foz do Brasil

Sabesp, Brazil’s state water utility for Sao Paulo, has signed a 34-year contract with environmental engineers Foz do Brasil to provide reused water from its treatment plant. When the $136 million project is completed, 65% of the water will be supplied to petrochemical company Quatar.

Loans and tenders

PAKISTAN: Japan provides funding for Murree drinking water project

Japan is providing a $283.785 grant for the Japan Mine Action Service (JMAS), a non-governmental organisation (NGO), to provide safe drinking water in areas of the city of Murree in Pakistan’s Punjab region. The grant will be used for the construction of water supply systems and for repairing broken water pipes and tanks in the three villages of Luss, Koharr and Upper Ghel in the city’s suburbs. JMAS will also teach the maintenance skills of the water supply system to the local residents.

CHINA: Chongqing gains funds for public service improvements

The World Bank has approved a loan of $84 million to China to aid Chongqing municipality’s efforts to meet the challenges of rapid urbanisation. The project aims to increase resident access to improved public services including roads, water supply, employment training, and primary health care. Roads and water supply is one of five components of the project, along with township and village infrastructure improvement and health and training-based initiatives.

AUSTRALIA: Government announces wide-ranging WASH funds

Australia has announced 44 water, sanitation and hygiene services projects to coincide with World Environment Day. The Australian government will provide more than AUD$31 million ($25 million) to support NGOs in providing toilets, clean water and promoting handwashing with soap in developing countries. The Civil Society Water, Sanitation and Hygiene Fund will support 11 NGOs to deliver the projects across sub-Saharan Africa, south and southeast Asia and the Pacific.

CROATIA: EBRD provides loan to improve Sisak wastewater system

The European Bank for Reconstruction and Development (EBRD) is supporting the modernisation of municipal infrastructure in the Croatian city of Sisak with an €11 million ($13 million) loan to co-finance the extension of the wastewater network and the construction of a wastewater treatment plant. The EBRD loan is for Sisacki Vodovod, the municipal water company servicing the city of Sisak and the surrounding towns and villages, which is owned by local authorities and the state.
EPA begins rulemaking process to tackle SSOs

The US Environmental Protection Agency (EPA) is starting a rulemaking process to better protect the environment and public health from the effects of sanitary sewer overflows (SSOs) and basement backups.

In many US cities, SSOs and basement backups occur because of blockages, broken pipes and excessive water flowing into pipes, the EPA points out.

Beside the evident health and basement issues, the EPA notes that combined sewer overflows can also contribute to beach closures, shellfish bed closures, contamination of drinking water supplies and other environmental and health concerns.

The EPA is considering two possible modifications to existing regulations: establishing standard National Pollutant Discharge Elimination System (NPDES) permit conditions for publicly owned treatment works’ permits that specifically address sanitary sewer collection systems and SSOs; and clarifying the regulatory framework for applying NPDES permit conditions to municipal satellite collection systems.

Municipal satellite collection systems are sanitary sewers owned or operated by a municipality that conveys wastewater to a treatment works operated by a different municipality.

As a part of this work, the agency is also mulling whether to address long-standing questions about peak wet weather flows at municipal wastewater treatment plants to allow for a holistic, integrated approach to reducing SSOs while at the same time addressing peak flows.

Veolia consortium to build and operate Reunion wastewater plant

The concession contract for a new wastewater treatment plant at Grand Prado in the district of Sainte-Marie on the island of Reunion has been awarded to a Veolia Water consortium.

The Reunion North Interdistrict Community (CINOR), the authority responsible for wastewater treatment in the districts of Saint-Denis, Sainte-Marie and Sainte-Suzanne (which contains around 190,000 people), awarded the contract, which covers design, financing, construction and operation of the new plant for 20 years.

This key project will help to rehabilitate the island’s natural environment using a sophisticated system of wastewater treatment designed to anticipate the needs of a steadily-growing population.

The new plant will have an initial capacity of 160,000PE, with the possibility of being extended later to 235,000PE.

The contract, won after an international call for tenders, is worth an estimated consolidated revenue of €270 million ($331 million) for Veolia Water.

The consortium is led by Veolia Water and the other members are OTV, Sogea and SBTPC (Vinci) and Egis Eau. Within the consortium, the engineering will be handled by OTV, a Veolia Water subsidiary that will lead the design and construction consortium and be in charge of equipment, apart from the tertiary treatment, which has been awarded to Sogea.

Civil engineering work will be the responsibility of Vinci, through its Sogea and SBTPC arms. Egis Eau will be responsible for supervising the works and project management for the construction component on behalf of Veolia Water.

To meet EU directive requirements, the project will comply with quality standards for urban water in sensitive areas and bacteriological quality of bathing water. It is based on a zero-pollution concept (for noise and odour), compliance with a green worksite charter for the construction element, and a partnership with the Reunion Island air quality office, which will organise a panel of volunteer ‘noses’ from among local residents during the operating period.

The project will be a benchmark in terms of sustainable development on the island, as part of the ‘Green Reunion Island’ project that stems from France’s Grenelle agreements. This means solar panels will be installed to generate power, electricity will be co-generated using biogas from anaerobic digestion, a microfiltration unit will reuse part of the treated water for the plant’s internal needs and rainwater runoff will be treated by phytoremediation.

The wastewater treatment train consists of pre-treatment, primary lamellar settling, low-load activated sludge treatment, clarification and tertiary treatment using a microfilter and UV. Odour removal will be via scrubber columns and monitoring networks comprising four ‘electronic noses’.

Sludge will be treated by thickening, digestion and indirect thermal dewatering. Work is scheduled to start in the second half of 2010 and commissioning is due in the spring of 2013.

New research announced into uninterruptable supplies

The UK’s Cranfield University has announced a new project to ensure an uninterruptable supply at the correct pressure, whatever potential disruptive events may occur.

Combining mathematics and risk analysis, the two-year project funded by the Leverhulme Trust aims to determine how to ensure water networks can withstand failure. Dr Paul Jeffery and Dr Alireza Yazdanif from Cranfield’s School of Applied Sciences are using a variety of computer-based analytical tools to look at the relationships between water distribution network layout and the ability of the network to continue to deliver a service when components are damaged or fail.

They hope to develop methods to assess network vulnerability and thereby help water utilities to save costs through improved protection of their assets and better security. Such methods could also be adapted as a decision support tool for others involved with critical infrastructure such as urban transport, energy and supply chain networks, Cranfield says.

Dr Yazdanif said: ‘Water services can be disrupted as a result of the ageing infrastructure being exposed to various hazards – from typical failures with low severity, to catastrophic events such as flooding, natural disasters and targeted attacks.

‘Rather like a network of roads where there are multiple routes between points A and B, a water supply network’s physical pattern of pipes, pumps, treatment works and junctions determines its ability to maintain services when one or more pathways are unusable.

‘While there has been similar research to look at the robustness of power grids, there hasn’t been much around water networks, yet these are classified as critical infrastructure. So protecting them and ensuring their efficiency is extremely important.’

Stockholm Industry Award winner

Cambodia’s Phnom Penh Water Supply Authority (PPWSA), under the leadership of its general director Ek Sonn Chan, has won the Stockholm Industry Water Award for 2010.

Decades of conflict left the city’s water supply system running low until the appointment of Mr Chan in 2003. He and his team refurbished the whole supply system, and introduced cost-effective billing and payment collection methods.

Accepting the award on behalf of the authority, Mr Chan said that this accolade put his organisation in the same league as other world-class water industry organisations, reinforcing their drive towards achieving future objectives.
Greek budget crisis prompts latest water sector reforms

Sparked by a need for reform of the country’s public finances, the Greek water sector faces its latest changes, under the government’s privatisation programme and due to plans to rationalise local administration. KEITH HAYWARD reviews developments.

The announcement by the Greek Ministry of Finance of plans to reduce the State holding of shares in the country’s two main water companies, Athens Water and Sewerage Company (EYDAP SA) and Thessaloniki Water and Sewerage Company (EYATH SA), to 51% are just part of the reforms that are to be carried out under the Hellenic Privatization Programme announced by the Ministry on 2 June. This is intended to raise a reported one billion Euros a year for the next three years through privatisations.

The programme has the stated policy goals of making effective use of public assets and resources in order to restructure the economy, foster economic development, contribute to fiscal consolidation and raise the overall quality of life. It also aims to safeguard public goods and state shareholdings in strategic and national security assets. And it is intended to guarantee public goods and ‘utilize the dynamism of the private sector so as to better serve citizens’.

The Ministry certainly appears to be flexible as to how it hopes to attract the private sector to the wider programme. It says possible levels of state ownership could range from a controlling state interest right through to complete privatization, and private sector input could be sought through various means, such as concession agreements, outright sales, initial public offerings, or holding companies.

Similarly, so deep is the crisis that the government is looking for private sector involvement in a wide range of state-owned assets, including banks, airports, energy, telecoms, gaming and real estate, as well as water utilities. It is also looking to reform and attract private sector investment in the state-owned railway group OSE which, according to the Ministry of Finance, has annual losses of almost €1 billion and about €10 billion of debt.

Prized water assets
Yet the government nonetheless hopes to retain overall control of the sensitive Athens and Thessaloniki water assets by maintaining 51% shareholdings. So the 10% stake in EYDAP, which has a market capitalisation of some €561 million (22 June), would be on that basis raise some €56 million, while the 23% stake in EYATH, which has a market capitalisation of €153 million (22 June), would raise some €35 million.

Greece has a total population of around 11 million. With EYDAP supplying water to around four million people and EYATH around one million people, these are understandably prized assets. The two companies have been listed on the Athens stock exchange for around a decade now, creating organisations run on a commercial basis, with full reporting requirements. After the State, the largest stockholder in EYATH is Suez Environment, with a 5% holding, while the largest stockholder in EYDAP after the State is ATB – Agricultural Bank of Greece, with a 10% holding.

The 2009 turnover for EYDAP was €386 million, with a profit after tax of €5.7 million. Its 2009 results showed a deterioration on all profitability measures and a decline in turnover for the first time since 2000. For 2009, EYATH reported a turnover of €77 million, with after-tax earnings of €14 million.

But against that backdrop of operating on a commercial basis, the Greek State committed under the law that established EYDAP to subsidising the water company to cover 60% of its capital expenditure on maintaining, restoring, improving or expanding the water supply and sewerage network, either using EU funds or the Greek Public Investment Program. As of the end of 2008, the company says it had spent around €430 million on capital expenditure since 2000 and claims a right to around €260 million in subsidy. According to EYDAP’s latest quarterly financial summary, it says it has received just €9 million to date and is in fact due a further €4.8 million in subsidy for capital expenditure in the first quarter of 2010.

Challenges and opportunities in climate change adaptation

A new World Bank water sector working note focuses on the adaptation of water utilities to climate change, discussing current efforts and what preparation needs to be undertaken for the future. LIS STEDMAN looks at the report’s main points.

The World Bank has recently released its ‘Climate change and urban water utilities’ report, which was prepared as part of a wider programme of work addressing climate change adaptation in the water sector being undertaken by the Bank’s Energy, Transport, and Water Department and the Water and Sanitation Program.

It reaches a number of important conclusions, among which is that an important difference between financially-viable utilities and those that are struggling is that well-performing utilities are now beginning to identify strategic options to address climate change concerns based on monitoring, analysis and the use of climate models.

Leading utilities from various nations are adopting a mix of scientific approaches in tandem with institutional reform to help set out their responses to climate-associated risks. Those helping with this process include the US’s Water Utility Climate Alliance and the Water Supply Association of Australia, which are both funding research to identify approaches to developing utility decision support systems.

Despite the risks, utility adaptation actions are often of an ad-hoc nature, the report warns, noting that ‘there is an evident need to address climate vulnerability more systematically’. Some current measures primarily address short-term concerns, and the document notes that longer-term actions often seem to be unaffordable or unfeasible because of their apparent complexity, a lack of scientific information relevant to the urban environment, or a lack of coordination with other authorities on issues such as watershed and resource protection, and flooding.

Climate change also intensifies the existing challenges that utilities face, the report says, and increases economic pressure to improve existing operational procedures. ‘This will require that utilities begin to consider the wider implications of climate change on water resources and its influence on service delivery,’ the report notes.

Traditional approaches to operations and investment planning have often not taken the inter-dependent nature of resources and urban delivery systems into account, the document observes. Climate change will require this interdependency to be addressed, so greater attention is given to water resources and source protection as well as improving the operational performance of the existing infra-structure. The report recommends that utilities incorporate principles of integrated urban water management (IUWM).

IUWM will allow utilities to consider the interaction between these various strands – resources, infrastructure, operations and planning. This will put them in a better position to consider how factors outside their traditional remits such as spatial development, pollution control, solid waste and stormwater management could influence service delivery. The methodology also acts as a strategic entry point for preparing climate vulnerability assessments.

Vulnerability assessments allow utilities to better analyse how far their system components are exposed to climate change, and identify adaptation measures that can reduce this potential exposure.
Pressures on smaller operators

The wider water sector too is feeling the effects of the efforts to improve the country’s financial position. Around four million people are served by the almost 230 DEYA – municipality-owned companies providing water and sewerage services. Olga Kotselidou is General Director of the Hellenic Union of Municipal Enterprises for Water Supply and Sewerage (DEeya), the association that represents 183 of the DEYA. According to Kotselidou, the DEYA receive financial subsidies from central government, but the subsidy provided has been reduced by 37% for 2010 to around €23 million. ‘Furthermore, we are afraid that this subsidy will be reduced more,’ she adds.

According to Kotselidou, this subsidy is provided to DEYA to allow them to carry out water and sewage works and pay off annuities on their loans. ‘The reduction of the financial support will have implications for DEYA, especially the small and medium DEYA, since they will have difficulties in paying off their loans and constructing their works,’ she says. ‘Also, we are concerned about the viability of some DEYA, especially the small companies and those that are charged by loans,’ she adds.

This view is supported by Dr Nikolaos Safarikas, an economist and General Director of DEYA Serron, who says that the subsidy cut, ‘or its total abolition’, will bring ‘big problems’ for the DEYA serving up to 30,000 people. Larger companies will, he says, have ‘fluidity’ (cash flow) problems financing works in progress, but this will be offset by salary reductions imposed by recent laws.

Safarikas also warns that DEYA will have to fall back on lending from deposit and loan funds, with rates of interest of up to 5.9%, in order to complete investment programmes. ‘They will have difficulties due to the bad economic situation… covering their financial obligations for the new loans,’ he points out, explaining that ‘they cannot raise the water price and also they will not be able to collect the bills on time’.

Alongside these pressures, the DEYA face changes under the new ‘Kalikratis plan’ for local government adopted in May of this year. ‘Because of this, the number of DEYA will be reduced,’ says Kotselidou. ‘Many DEYA will merge and we estimate that after the implementation of ‘Kalikratis’ in 2011, we shall have 142 DEYA.’ What is more, she anticipates that the number of people served by DEYA will increase from four million to more than 5.2 million.

However, these reforms should be seen in the context of the history of DEYA and the fact that, according to Safarikas, there are questions around the viability of DEYA, especially the small and medium-sized ones. ‘A lot of new companies were established during the implementation of the ‘Kapodistria’ law in 1997 – from 80 they became 227,’ says Safarikas, ‘but most of them are not viable,’ because of a lack of cost recovery and because of their overheads.

Private sector prospects

A Greek Ministry of Finance document setting out its privatisation plans indicated that it may go further than reducing its stake in the Athens and Thessaloniki water utilities. Under the banner of ‘Hellenic Waters S.A.’, it indicated it would look at the possibility of including EYATH, EYDAP and other regional water utilities into a holding company. Both Kotselidou and Safarikas comment that this was raised in the Greek media but that they are not aware of further details. However, this raises the question of how attractive water utilities other than EYDAP and EYATH may be to the private sector.

Kotselidou points out that the DEYA are municipal companies established and functioning under a special law (1069/80) and the Municipal Code that provides the legal framework for municipalities. ‘We believe that the transfer of DEYA to the private sector is quite difficult for the time being since an amendment of the legal framework is required,’ she says.

Even if this challenge could be overcome, she still questions their attractiveness. ‘The big DEYA are viable because they have skilful personnel, know-how in the water and sewage sector, and their pricing policy is quite reasonable.’ But she adds that some of the DEYA, especially the small ones, have problems with viability. ‘DEYA wouldn’t be attractive to the private sector,’ she says, due to the high operation and maintenance costs and the costs they face servicing repayments, coupled with a failure to recover costs as required by the EU Water Framework Directive.

Safarikas supports this view: ‘For the time being DEYA are not attractive to the private sector because they have accrued big losses due to the big investments they have [made] and as a result they have to pay big annuities. They also have high running costs. Only about 5-10 big companies (above 70,000 inhabitants) may be attractive for the private sector.’

and improve resilience.

Each adaptation option must be screened for financial viability using utilities’ existing evaluation processes for investment planning. The report says: ‘“No regret” investments are worth doing anyway, no matter what the eventual climate change stress may be on a particular system.’

Such investments do not have climate change as the primary factor in the decision making process. ‘Climate justified’ investments, on the other hand, are of benefit only if climate change impacts actually occur and the overall benefits of taking an action are found to exceed the marginal cost following a cost-benefit analysis. ‘Undertaking such analyses can serve as a major input into the formulation of climate action plans for short and medium terms,’ the report says.

Targeted communication with customers and improved coordination among municipal authorities about potential climate change impacts on water resources and services can complement climate action plans, the report suggests. There are a variety of activities that are encompassed in this overall recommendation, including publishing brochures, announcing reservoir storage levels, and intensifying knowledge exchange with cities sharing similar climatic risks.

The World Bank also recognises its own potential role, noting that ‘the implications of climate change may strongly affect the development impact of World Bank projects in the urban water supply and sanitation sector and similarly reduce a nation’s capacity to recuperate economic and financial losses incurred from related impacts’.

The Bank is in a good position to undertake the role of disseminator of emerging best practice and facilitator of the knowledge exchange process, it acknowledges. Indeed the report itself is part of a larger World Bank effort that is seeking to provide both analytical and strategic aid to both Bank staff and utilities in client countries as they begin to consider impacts on water resources.

The report aims to improve understanding and awareness of the operational implications of climate change for urban utilities and present utility-level adaptation actions for inspiration. It also establishes an analytical framework to help its staff and utilities in client countries to identify and prioritise potential adaptation measures, and assesses the feasibility of implementing such measures based on a set of criteria.

The wider report provides ample evidence of climate effects and the challenges that utilities face, interspersed with case studies such as Dhaka in Bangladesh, one of the fastest-growing megalopolises in the world, which is facing severe climate-related problems. Another urban utility facing challenges is Nairobi Water, which is finding its capacity to start addressing climate change is highly limited because of pressures such as decreasing surface water supplies, increasing competition from farming and an increasing water demand from a rising population, and inadequate infrastructure.

However, the latter is working hard to resolve its issues, with actions including a new approach to watershed management that involves developing a partnership with the country’s environment ministry and private companies that may have direct or indirect interests in watershed protection.

The spread of examples make clear the enormity of the challenge that lies ahead, but provides extremely valuable information on possible approaches that utilities that are in a position to plan for climate change can take. As might be expected, reducing non-revenue water, water reuse, domestic roofwater harvesting and the pros and cons of adopting metering are discussed among other potential actions. Some of the case studies illustrate best-in-class activities, and the report in total will provide much food for thought for urban utilities.
Water utilities and the sector as a whole need to be able to assess what greenhouse gases they are responsible for as a first step towards reporting on and managing this environmental impact. STEFANIA GALLETTI and BARBARA BAFFEO-BONNIE describe some of the main tools used in the UK in greenhouse gas accounting, reporting and management.
September 2009), which are based upon the GHG Protocol (World Business Council for Sustainable Development, Water Resources Institute), an internationally recognised standard. Although UK businesses are not subject to specific GHG emission reduction targets, they are encouraged by this guidance to tackle their carbon impact on a voluntary basis. The Defra / DECC guidance provides recommendations on emission measuring and accounting, as these are seen as the first steps to managing and reducing the carbon impact of operations. By passing the Climate Change Act 2008, the UK government must introduce new regulations requiring the mandatory reporting of organisational GHG emissions by 2012. UK water companies will benefit from taking early action using CAW.

**Accounting boundaries**

CAW provides company emission estimates according to the recommendations of the Defra / DECC guidance and as required in the annual disclosure of information to Ofwat. The main difference between the Defra / DECC guidance and the Ofwat reporting requirements is the respective accounting boundaries. These boundaries define the sphere of a company’s operations and activities, which must be included, and hence which emissions must be calculated and reported. In contrast with the Defra / DECC guidance, under which emissions from all activities should be reported, emissions reported to Ofwat must only relate to the company’s ‘appointed business’, i.e. the regulated activities that are necessary in order for the company to fulfil the functions and duties of a water and sewerage undertaker. According to this definition, emissions arising from the disposal of company waste to landfill, or from the application of biosolids to third party land, are not included in the totals reported to Ofwat.

**Renewable energy generation**

Total emissions estimates are displayed in summary tables as company gross and net emission figures. Net emissions are obtained by subtracting the emission credits and reductions that the company has been able to declare in the financial year, such as via renewable electricity guarantees of origin (REGOs). Credits and reductions can be claimed mainly in relation to the generation of electricity, usually when this is achieved by means of renewable sources (combined heat and power plants run on biogas, small hydroelectric plants, wind, etc.).

The multiple incentive schemes available in the UK make carbon accounting of renewables complex. A number of pragmatic decisions were taken in close consultation with UKWIR to produce a tool which satisfies the majority of permutations faced by its users.

**Focus on improvement of energy efficiency**

CAW also estimates the uncertainty in emissions figures, primarily based on the uncertainty from the EFs used in the calculations. Another UKWIR study carried out by WRc demonstrated that on average, emissions of methane and nitrous oxide from water company operations (especially sewage treatment and sludge management) are lower but far more uncertain than emissions derived from the use of electricity. Although there is a willingness to research for more accurate EFs for specific water industry processes, UK water companies remain focused on achieving best efficiency of energy use on site. The reduction of energy consumption has the double benefit of reducing carbon emissions as well as operating costs. WRc has been coordinating a programme on energy efficiency and benchmarking for water utilities since 2006. The programme, which has international breadth, offers the following major benefits to the participants:

- Identify effectively where to save energy;
- Monitor improvement in energy use at process level caused by changes within a treatment works;
- Identify and share best practice with others.

An online software tool allows analysis of energy consumption data at treatment works or process level. The tool calculates energy performance indicators (EPIs) and allows benchmarking against other participants on an anonymous basis. The outputs can be used to identify efficiency improvement measures and return on investment of implementation. This is an on-going project and new participants are able to take advantage of the software and existing model base.

**Economic appraisal of carbon abatement measures**

There are many potential strategies that can be used to achieve reduction in carbon emissions. However, within the constraints of limited capital budget, compliance with tight regulatory standards and time, there is a need to provide water companies with a tool that will help them meet their carbon reduction targets at least cost. WRc has been working with some water companies in the UK to deliver
carbon abatement tools (CAT) that allow water utilities to identify the most cost effective programme for delivering carbon reduction targets for the whole of their business within an economic framework. These tools help identify and prioritise carbon reduction programmes. They aim to facilitate clear and rational decision-making, taking ‘carbon planning’ into the boardroom on the same footing as other aspects of project appraisal. The schematic framework of the tool is illustrated in Figure 2.

There is a need for water companies to define the baseline or ‘business as usual’ (BAU) scenario, the projected BAU emissions, and the abatement target that they want to achieve within defined timescales. BAU typically describes a plausible future in which no specific actions or projects are taken to reduce carbon emissions.

The first step is for companies to develop an unconstrained list of potential abatement strategies that could be implemented to achieve a reduction in carbon emissions, including both adaptation and mitigation options. This list is usually developed by key staff through a brainstorming session to understand the current situation and the potential options that might be implemented taking into account the technological feasibility, ease of application and the availability of expertise to effectively implement and manage the option. Each abatement option will have different degrees of efficacy, cost and limitations. CAT therefore provides an interface for a constrained short list or programme to deliver a defined abatement target.

The key inputs for this tool include a profile of cost (direct and indirect) of options, projected GHG emissions as result of option implementation, and the BAU emissions. Other inputs modelled by WRc include information on embodied carbon (e.g. if construction of new facilities is required to implement an option), emission factors and the monetary implication of policies and legislations including the carbon reduction commitment energy efficiency scheme (CRC), renewable obligation certificates (ROCs) and ‘green’ purchased electricity.

The output of the analysis include the net present value (NPV) of options, which helps make decisions based on an objective financial criterion; the average incremental cost (AIC) which is used to rank options based on their cost effectiveness, and a scoring matrix for intangible environmental and social impacts of options.

Marginal abatement cost curves
A key graphical output of the CAT are marginal abatement cost curves (MACCs), which help provide an understanding of the cost implications and level of emission reduction which a range of abatement measures could deliver at a given point in time. The options are ranked in terms of their AIC (net cost per tonne of CO₂e abated) and it is assumed that options will be implemented sequentially in order of decreasing cost effectiveness. As illustrated in Figure 3, a stepped MACC results as the company moves towards greater abatement, bringing options online sequentially, each delivering carbon reduction at a somewhat higher net cost than its predecessor.

Conclusions
The need to reduce carbon emissions from the UK water industry is rising and will become a more pressing issue in the coming years. Concerns about climate change, regulatory requirements on reporting GHG emissions and the introduction of the mandatory cap-and-trade initiative CRC Energy Efficiency Scheme have focused water companies’ attention on carbon reduction strategies for the whole of their business. The tools that have been developed for the UK water companies are enabling them to optimise their limited budgets for carbon reduction strategies and to provide sound, scientifically based reports to government and regulators. Similar tools could benefit operators across the world.


Notes
3 www.energypi.co.uk. Energy Performance Indicators software tool.

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The countries of eastern Europe have to make up a huge gap that separates them from the other countries of the continent, this being obviously the case for the new member states of the European Union (EU), which have infrastructure that is insufficiently developed and, with very few exceptions, technically obsolete. This is also the case in non-member states, such as Albania and Moldova.

There are also large discrepancies between eastern European countries themselves, depending on their heritage of the Soviet era and approach to the last two decades. Thus, countries such as Poland and Hungary, the first two countries of a region that gave up on Communism, have had the benefit of support from the EU since June 1989, through the Phare Programme (the abbreviation of Poland Hungary Aid for Reconstruction of the Economy).

The Phare Programme was one of the instruments of non-reimbursable financial aid granted by the EU, providing support to the candidate states from central and eastern Europe in their pre-accession efforts. As other states from central and eastern Europe passed to democratic forms of government, they were also included in this programme. Thus, by 1996, 13 states had received Phare non-reimbursable funds: ten candidate states at that time (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) and three non-candidate states (Albania, Bosnia–Herzegovina and the former Yugoslavian Republic of Macedonia).

As far back as June 1989, Poland had in operation an institution called the National Fund, meant to coordinate water infrastructure development, and since then it has administered billions of Euros from European grants, as well as from reimbursable funds and loans.

Romanian objectives

Romania has declared its entire territory a sensitive area and aims to provide access to a centralized water system by 2020 for the entire urban population (currently 94%) and 85% of rural population (compared to less than 50% at present). The objective for wastewater treatment is that by 2018 the entire amount of wastewater will be collected and treated (see Figure 1).

Within the country’s Sectoral Operational Programme (SOP) ‘Environment’ there is an estimated investment need of €19 billion ($23 billion) in order to settle all issues from water supply and wastewater treatment in Romania. Other studies estimate this need to be more than €30 billion ($36 billion).

The investment needs in new EU member states for the period ending 2013 are shown in Figure 2. Romania alone needs €3.8 billion ($4.5 billion) in the water supply field and €4.8 billion ($6 billion) for wastewater collection and treatment, among the largest amounts of all new member states of the EU.

For the period 2007–2013, Romania expects an EU contribution from Structural and Cohesion Funds of about €2.8 billion ($3 billion), which is far bellow the estimated needs in the same period. During this period it is also expected that there will be a Romanian contribution of €0.5 billion ($0.6 billion), from water company loans, local authority contributions and the central budget.

Current investment progress

SOP ‘Environment’ includes 31 major projects (at the level of one or two counties). Out of these, 26 have financing applications totaling €2.5 billion ($3 billion). Ten of these applications have already been approved by the European Commission. Five (totaling €675 million ($808 million)) are in the approval process. Another 12 projects, totaling €1.3 billion ($1.6 billion), are in the submission process. The remaining four projects are in the planning stage.

The value of the approved financed contracts concluded by the ten regional operators represent one third of the total amount allotted for years 2007–2013. Out of the pre-financing granted to start the projects, only a tiny part was used, mostly for advance payments. There has been practically no physical progress.

Out of 150 contracts relating to approved projects, only 74 have been signed. This is due to delay in the preparation of tender documents by consultants and the slow development of tendering procedures. The lack of experience of the water companies in developing procurement procedures for investment on a large scale, as well as the large number of disputes relating to submitted tenders, have caused delays. Thus, out of 74 concluded contracts, almost all – 71 – were signed with delay due to tendering disputes. The other 76 contracts not yet concluded are delayed when compared to the proposed schedule.

The operators

In Romania, the entire infrastructure (water grid, sewerage network, water and wastewater treatment plants, etc.) is the public property of local authorities. The water supply service is provided, with very few exceptions, by public companies specialized in water and wastewater services, with the
capital entirely belonging to local authorities. The service is provided in smaller localities by companies that also provide other public services (e.g. solid waste or gardening), or ‘specialized’ services established by the city hall department. The infrastructure status is bad in most localities and the operators are in a ‘masked’ insolvency.

The economic and financial crisis has affected the entire economy and implicitly the water services field. Operators have experienced a decline in their financial and economic status through a decrease in water demand and a low rate of bill payment by consumers. This is reflected in a low level of investment carried out by operators, using their own funds, and a decreased attractiveness for the financing banks. All of this is at a time when the water companies have to sustain a process of regionalization and co-finance investment in water infrastructure alongside EU Cohesion Funds.

**Regionalization**

Romania’s institutional arrangements stipulate that project implementation and operation of water and wastewater systems should be performed by regional operators, each accepted by localities gathered in intercommunity development associations (IDAs). These associations control the operator as though it were their own department. The role of regional operator was awarded to the larger companies in the county. Thus, a first phase would result in 40 operators – as many counties as there are in Romania – but with the possibility of having two ‘regional’ operators in a county (e.g. Sibiu, Brasov) or having companies that operate in two counties (e.g. Water Company Somes Cluj). Ultimately there should be ten operators, one for each hydrographic basin, but it is not possible to estimate the time horizon necessary to reach this objective, or determine how the local authorities will make these mergers.

The operation of this service in smaller localities inevitably involved taking over all technical and environmental problems, as well as financial loss. In most cases, the takeover also involved taking over the entire personnel of the former operator and covering the costs until restructuring took place.

In the case of operators undergoing a rapid expansion, their economic status was impaired, having to keep in operation the systems taken over, restructure the company, and provide co-financing and project implementation, all in a crisis period. Thus, there were companies that had reported an operating loss after the first half of 2009.

The poor financial status of some operators makes the contracting of loans difficult. The banks show restraint in awarding loans, or they apply high interest rates. The Romanian government has therefore decided to guarantee these loans in order to solve this situation.

**Tariffs / regulation**

In Romania, tariffs are proposed by operators, agreed by the National Regulating Authority (ANRSC) and approved by local councils or IDAs. The tariffs should cover operational costs and investment loan reimbursement and should be at a reasonable level for users. The tariff applied for water is the same for all types of consumers, whether residential or company, but the tariffs differ between localities. At present, operators are developing a programme to unify the tariffs in all the localities in which they operate. This process is estimated to be concluded in 2011-2012. The ‘polluter pays’ principle is applied, with the possibility of applying different tariffs for industrial wastewater treatment, depending on chemical load.

Connection work is supported by users, apart from when network rehabilitation projects and development projects are implemented by the operators according to their investment plan. The operator may ask to develop the network to the area where the consumer is located, and the resulting line becomes city property and is handed over, without any compensation, to be operated by the water company.

The tariff policy is stipulated by International Financing Memorandum provisions concluded with the EU and / or International Financial Institution Agreements, which co-financed investments.

In comparison with other European countries, Romania is at the middle of the classification, having tariffs higher then in former Soviet countries, but with lower tariffs then in central European countries.

**Collection rate**

Provision of liquid funds, essential for any company, depends on the payment rate of issued invoices. During recent years, more and more operators have achieved very good rates, some of them reaching 85% and above. For most operators, obtaining payment from consumers is currently more difficult compared to last year.

There are also cases where the rate is alarmingly low. It can be expected that as the financial status of these companies will be impaired in the middle- and long-term, possibly preventing them from paying their obligations to suppliers and / or creditors. The total debt amount accumulated by the operators is between 10% and 60%, with an average of 25% in relation to turnover.

Analyzing the correlation between the level of applied tariffs and the payment of bills, the conclusion is
surprising: operators with the highest tariffs usually register the highest collection rates. This is clearly related to proper debt management.

Tariff affordability

The national strategy provides that the necessary investment for the coming period, including the operational costs, is made within the limits of tariffs that will generate an average invoice of up to 3% of a family income (see Figure 3). Hence, affordability depends both on the tariff itself and on consumption and population incomes.

During the last ten years we have seen a halving of consumption, but also a doubling of real incomes, so at present we achieve a reasonable value for the invoices, considered as less than 2% of a family income.

The average income of a family differs from one part of the country to another, depending on the level of development achieved. There is also a significant difference between the income of the families from urban and rural areas, and the distribution of income between those on the lowest income and the middle range is considerably high.

Given single tariffs and different incomes, the actual affordability is derived from the consumption by each category of consumer. The absence of a means for supporting the population with the lowest income may lead to difficulties in payment of bills, and in particular could make it impossible to increase tariffs to what would be an acceptable level for other categories of customer.

Maintenance Replacement Development mechanism

One of the most valuable lessons learned during the last 15 years has been the establishing of the Maintenance Replacement and Development Fund (MRD) (see Figure 4). This financing mechanism was included in the first Loan Agreement signed in 1995 between the Romanian government and the European Bank for Reconstruction and Development, and was meant to ensure that all profit from tariff increases is used for loan reimbursement and infrastructure development. Consequently, a MRD borrowing account was opened by each water company and supplied amounts corresponding to depreciation of the operators’ fixed assets, with royalties for water infrastructure paid to local authorities by operators. So, along with royalties, the entire gross profit tax payable to local authorities (as the owner of the water companies) are returned by each city / county council to the MRD account. The remaining net profit (after taxation) is retained by the operator as dividends and are not distributed to shareholders (local councils).

In addition, the local authorities exonerate the companies from any other local taxes or, when this is not legally permitted, the amounts equivalent to the taxes applied are allocated from the local budget and repaid to the MRD fund.

So, all the profits generated by the water companies are returned for the renewal of water and sewerage infrastructure, and the consumers’ payments are not taxed. Since 2005, the MRD financing mechanism has been compulsory by law for all water companies implementing international funding investment.

Depreciation

Depreciation is the reduction in the value of an asset used for business purposes during a certain amount of time due to use, passage of time, wear and tear, technological obsolescence, depletion, inadequacy, rot, rust, decay or other such factors.

Romanian legislation allows only for the calculation of companies’ fixed asset depreciation (office buildings, vehicles, furniture and equipment), but does not recognize the depreciation of public fixed assets, representing the entire water and wastewater infrastructure (water and wastewater networks, pumping stations, water and wastewater treatment plants, etc.). As result, public asset depreciation cannot be a fiscally deductible cost and neither can it be recognized in the tariff. In order to resolve this situation and have the equivalent value reflected in the tariffs, some companies have set the due royalty to the same level as depreciation. However, this practice is not undertaken across the whole country.

In the long-term, once new investments are performed, the level of the depreciation will be considerably increased, putting an additional pressure on tariffs. This already happened in Poland, a country that has put in place large investment projects during last 20 years.

Conclusions

Eastern European countries are facing serious problems of long-term financing of water infrastructure and providing sustainable services, particularly where regionalization processes may introduce new financial issues to tackle and force water operators to cover larger service areas, sustaining at the same time investment and operational costs.

Regulatory regimes and pricing policy strategies are closely connected and thus directly impact on revenue stream stability – the pivotal prerequisite to financing water services development both in the short and in the long run.

The economic and industrial environments, which differ locally, as well as the need to match conservation efforts with affordability problems, mainly incurred by people living on social welfare, similarly affect the design of water pricing policies designing. However, to a large extent, waterworks should be self-supporting and the subsidisation of water prices by the government should be avoided.


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Water utilities everywhere face the challenge of being more energy efficient. A project has been underway to help utilities rise to this challenge by gathering together a compendium of best practices from around the world. ROGER MIDDLETON and JOS FRIJNS outline the project managed by UK Water Industry Research and supported by the Global Water Research Coalition.

After manpower, energy is the highest operating cost item for most water and wastewater companies. Over the last decade, energy consumption has increased as a result of the implementation of new technologies to meet new potable water and effluent treatment quality standards. The price of energy has also substantially increased and this cost impact will be compounded by the need to meet future changes to regulations and standards that will require additional energy intensive processes to achieve more exacting requirements. High energy consumption will affect the water industry worldwide and is inextricably linked to the issue of climate change.

Building and managing its infrastructure in a cost-effective, energy efficient manner is nowadays seen as an important responsibility for the water industry. With the aim of learning from each other, a project has been carried out and recently completed to collect best practices of energy efficiency in the water industry. The project was managed by UK Water Industry Research (UKWIR) and supported by Global Water Research Coalition (GWRC) partners worldwide, as represented by substantial inputs from the four continental coordinators in the US (Water Environment Research Foundation (WERF)) and Water Research Foundation (WRF), Europe (KWR Watercycle Research Institute and Foundation for Applied Water Research (STOWA)), Singapore (PUB, Singapore’s national water agency), Australasia (Water Services Association of Australia (WSAA)), and South Africa (Water Research Commission (WRC)).

Project objectives

The objective of this UKWIR/GWRC project was to develop a compendium of best practice and technologies in the energy efficient design and operation of water industry assets.

The scope of work covered the principal activities of the whole water cycle from abstraction to discharge, including: raw water treatment and distribution; wastewater conveyance and treatment; water reuse; and sludge treatment and disposal. Building services were also covered, with opportunities for reducing net energy demand by using renewable energy. A priority shortlist was discussed with all parties early in the project to focus attention on the parts of the water cycle and technologies thought most likely to yield the most energy savings. Two levels were covered: incremental savings from optimisation of existing assets and operations – the ‘low hanging fruit’ – and more substantial savings from investment in novel processes or technologies, although these must be proven at full scale.

Team effort

The project involved international engineering firm Black & Veatch in two ways. The front end discussion documents were prepared from a desk study, with guidance for gathering case study information to ensure consistency. This was agreed with the global partners along with ideas for the presentation of the final compendium. At a local level B&V interviewed most of the water utilities in the UK and gathered case studies and examples of how they had improved energy efficiency. The UK report was combined with the European report for the IWA Water Utility Conference – Strategic Opportunities for Future Challenges 2010, held in May in Barcelona, Spain. Black & Veatch are also compiling the global compendium from all of the continental coordinators’ inputs. There are excellent case studies on most aspects of energy efficiency and savings, including:

- Pumping, aeration and renewable energy from the UK and Australasia;
- Process optimisation, pumping and biogas energy from Europe;
- Pump efficiency and renewable energy from the US; and
- Water conservation and pumping from South Africa.

Both incremental improvements in energy efficiency through optimisation of existing assets and operations and more substantial improvements in energy efficiency from the adoption of
novel technologies can be distinguished. Examples with potential include the improved operational set up of pumping design, online aeration control, and energy efficient bubble aeration and sludge belt thickeners. Next to optimising energy efficiency across the water cycle, there are also opportunities for energy generation. Appealing practices include biogas production from sludge (co)digestion, heat recovery from wastewater, and hydraulic energy generation from micro-turbines.

The key areas for savings were identified: about 80% of the water industry energy demand is from pumps. For the wastewater sector using activated sludge plants or their derivatives, about 60% of the energy demand is from air blowers. However, for best energy efficiency the whole system must be considered, not just the pump or blower, and the compendium provides advice and examples of how savings can be cost effectively realised as in the fact sheet and case study in Figure 1.

**Accessibility of information**

It was recognised from the outset that the significant amount of information and data in the compendium would need to be presented for ease of reference. This has been facilitated by the Water Matrix (see Figure 2). This is a word table with the water cycle across the top, from raw water abstraction through treatment and distribution, to sewerage, treatment and disposal. Down the left hand column are the various techniques and processes used in the industry, from conservation and leakage control, through pumping, primary, secondary and tertiary treatment to sludge processing. Below this are included building services and renewable energy including hydro-turbines and sludge gas combined heat and power (CHP).

The matrix allows the user to pinpoint their interest and see quickly what technologies and examples are available. The compendium is a complete electronic document and the user can click on a process in the matrix to go straight to the relevant fact sheet. The process and its major issues are described, the technology is explained and there are estimates of what savings can be made with relevant case study references. Most process areas have one fact sheet, but to cover pumps and their systems there are eight, including subjects such as correctly sizing pump for their duties, hydraulics and variable speed drives (VSDs).

Those matrix areas with significant potential for energy savings are coloured. If the user clicks on a case study tabled in the matrix, the links go straight to the case study document. Information is presented in a standard format including the location and any regulatory background, starting and end situations, changes made, savings, costs, operation and other impacts.

The user can therefore quickly find details of the technology and examples of energy efficiency projects in any area of interest, which may be on the other side of the world or in their own back yard. It is hoped that this will stimulate further activity in energy saving and particularly help those utilities without access to research or advanced engineering facilities.

**Outcomes**

It is evident that significant global cuts in energy demand are required as typified by the UK’s commitment to an 80% reduction by 2050. The GWRC members are developing concepts, tools and technologies that contribute to an energy and carbon neutral urban water cycle by 2030. The water industry challenge is to achieve this against the background of increasing standards and rising human population. Bearing in mind the design life of water industry assets this should start now, before we enter an energy-limited economy.

Depending on the starting point and geography, it seems possible to save between 15 and 25% of energy demand through efficiency savings at utility level, although some individual examples of 50% savings are given. Most plant and process areas of the water cycle are covered by case studies although there may be a few outstanding opportunities.

It is estimated that most of the viable energy efficiency savings can be achieved in about ten years with the right regulatory framework or corporate will. The remainder of the challenge will then be to develop new water cycle concepts and technologies and at the same time change social, economic and political behaviour to attain the balance of the 80% target.


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Jos Frijns (bottom) is Senior Scientific Officer at KWR Watercycle Research Institute, which is a lead European Continental Coordinator for GWRC on this project.
Organisational structure and size: experiences in the UK water sector

Reforms of the UK water sector over the last 60 years have brought considerable benefits, particularly through amalgamation of many small operators, and offer a useful perspective to other countries going through the process of consolidation. BILL BAKER, SHAMEEL AHMAD and MARK ROBINSON review the changes, and look at the implications of the latest reforms – efforts to bring greater competition to the sector.

Water and sewerage services are delivered by organisations which differ a lot from place to place. They vary by size, scope, nature of regulation or contract, ownership, and source of loans. The sector needs to improve service quality, reduce environmental impacts, and mitigate climate change impacts while household and government owners, and source of loans.

Service quality, reduce over 60 years in the UK and we outline the nature of regulation or contract, budgets are stretched. Policy-makers, regulators and managers are looking for productivity improvements. No organisational model will be universally best, but experiences from other places can provide insights.

A series of reforms were undertaken over 60 years in the UK and we outline them below. Improvements came firstly from amalgamation of water and sewerage suppliers to build scale and scope and to establish strong management independent from local politics. Further improvement came from independent incentive-based economic regulation and from private ownership. We also briefly mention current suggestions to introduce competition.

A history of amalgamation

Over the last 60 years in all four countries of the UK small water and sewerage operators have been amalgamated, initially by local mergers then by new central government laws. The objectives were to achieve technical and professional competence in management, to secure supplies, to take advantage of economies of scale and scope in water reservoirs and bulk pipelines, and in water, sewage and sludge treatment facilities, and to manage the whole water cycle at a river basin level.

In the 1940s there were more than 1000 water suppliers in England and Wales. Most were local government bodies but there were some private suppliers with a long history. At that time 34 River Boards were created for pollution control and drainage. These were reformed in 1963 after problems with flooding, drought, and growing water demands, and the 29 new River Authorities were responsible for planning and developing water resources for their regions, and for abstraction licensing.

Between the 1940s and 1960s, many small water suppliers were voluntarily amalgamated into joint boards, and the city-based water supply areas were extended to suburban and rural areas. A smaller number of mergers were forced by central government. By 1970, England and Wales had reduced the number of water suppliers to 198 – comprising 101 joint boards, 64 local authorities and 33 private companies. In sewerage, there was little amalgamation and in 1970 there were still around 1300 authorities.

In 1971, the Central Advisory Water Committee suggested that there should be between six and 15 regional authorities for the whole of England and Wales, planning and controlling water resources in an integrated river basin management (IRBM) model. The Committee did not state whether water and sewerage suppliers should be included or left separate. In 1973 central government passed laws creating ten large Regional Water Authorities (RWAs) to cover the whole of England and Wales, combining the existing River Boards and all public sector water and sewerage suppliers, and having both the environmental and the water and sewerage service duties. (The 30+ private water companies which provided 25% of water supply at that time were left separate). This reform brought scale and scope and strong management under a strengthened IRBM approach.

Soon afterwards the central government revised the RWA Board membership, introducing smaller skills-based boards appointed by the Minister instead of the initial very large Boards representing each region’s local governments. This increased RWA independence from local politics and further encouraged professional management.

In 1989 a water and sewerage company (WaSC) was formed for each of the ten RWA regions and was sold to private investors on the stock exchange. All the environmental regulation functions were combined under the new National Rivers Authority, which was eventually merged into the Environment Agency. The Office of Water Services (Ofwat) was formed to implement price cap incentive regulation for both the WaSCs and the smaller private water companies. Drinking (potable) water quality regulation continued to be undertaken by the Drinking Water Inspectorate.

The private companies have proposed more amalgamation in England and Wales since 1989 but by law all water mergers involving a turnover of £10 million ($15 million) or more must be approved by the UK Competition Commission (CC). The benefits, including efficiencies from integrated resource management, economies of scale, and best-practice transfer, are compared with any detriment to Ofwat’s ability to make benchmarking comparisons due to losing the ability to observe a separate company.

In practice, the small private water companies under the turnover threshold have mostly been acquired and merged into bigger suppliers. For larger merger proposals, the CC has usually accepted Ofwat’s advice that the detriment to its benchmarking would be very substantial. The CC has approved no WaSC–WaSC merger proposals, blocked one out of four other proposals from 1989–1995 and blocked four out of five other
proposals since. However, merger proposals continue to be made by companies, who in their submissions forecast substantial service benefits and cost savings. This suggests that, benchmarking questions aside, there would be economic gains from further amalgamation. Table 1 lists the main gains listed in six merger proposals reviewed by the CC.

Similar amalgamations of small suppliers have been made in the other countries of the UK as well. In Scotland, water and sewerage providers from local councils were merged into regional bodies, which by 2002 had been merged into just three large regional authorities covering the whole country. The Scottish Parliament then ordered their merger into a single state-owned company – Scottish Water – providing all water and sewerage services under independent economic regulation. In Northern Ireland, the services were provided by local councils until 1973, when they were centralised within the Department of Environment’s Water Executive. A few years ago a state-owned company – Northern Ireland Water – was created to undertake the services for the whole country under independent economic regulation, though household tariffs are not yet applied. Large long-term (private finance initiative (PFI)) contracts have been used to delegate activities to private operators in both Scotland and Northern Ireland.

Table 2 shows that the smallest water companies in England and Wales today, which have always been privately owned, are tiny by comparison with the largest privatised water companies. Under Ofwat’s measurements, the unit costs of the surviving small companies are similar to the unit cost of the large companies. There are local factors, including the hydro-geography, the quality of the management, and the owner’s focus, which can substantially affect both the minimum feasible local cost level and the local cost level that is actually achieved.

Nevertheless, the general lesson from the UK is that the amalgamations, from thousands of suppliers to 20 or so water companies and 12 sewerage companies for the whole UK, have enabled large improvements to be made through professional management, by exploiting substantial scale and integration economies in accessing raw water sources, in storing raw and treated water storage and moving it in bulk, and in water and sewage treatment, as well as by exploiting lesser but useful scale economies in many other operating activities, and scale economies in accessing private finance. These steps have improved the service quality and reduced customers’ payments.

As well as amalgamations, UK reforms to regulation and ownership have been important drivers of continuing improvement. We outline them in the next section.

**Innovation in regulation and ownership**

Large organisations must be steered well to deliver good results. An important UK step in 1989 was to separate policy-making (retained by central government), regulation (by setting up Ofwat, the quality regulators, and later the Scottish and Northern Ireland economic regulators, as independent bodies), and operations (undertaken by the water and sewerage companies). This clarified organisational objectives and made each organisation more accountable for fulfilling its own duties.

Economic regulation of water and sewerage was reformed when departmental budgetary control was replaced by price cap regulation in England and Wales from 1989. This was later adopted in Scotland and Northern Ireland. In England, Wales and Scotland tariffs are at full financial cost recovery levels. The price cap is fixed for five years at a time, providing a private owner with a financial incentive to reduce costs. Strong quality regulation is used to ensure that cost reduction is not achieved by quality reduction.

The step to private ownership in England and Wales in 1989 removed

<p>| Table 1: Benefits of proposed mergers in the UK |</p>
<table>
<thead>
<tr>
<th>Proposed merger</th>
<th>Main benefits listed in submissions to the Competition Commission</th>
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<tbody>
<tr>
<td>Mid Kent / South East (2007)</td>
<td>(a) £3 million ($4 million) p.a. operational expenditure (opex) savings within two years</td>
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<td></td>
<td>(b) Capital expenditure (capex) savings (quantified by parties, but redacted in public CC report)</td>
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<td></td>
<td>(c) Reduced cost of capital</td>
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<td>(d) Water resource benefits (including improved security of supply)</td>
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<tr>
<td>Vivendi / First Aqua (2002)</td>
<td>(a) Cost savings (unquantified, with no estimate of savings to customers)</td>
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<td></td>
<td>(b) Best practice and technology transfer, especially to improve Southern Water’s environmental performance</td>
</tr>
<tr>
<td></td>
<td>(c) Water resource benefits (including improved security of supply)</td>
</tr>
<tr>
<td>General Utilities / Mid Kent (1997)</td>
<td>(a) Best practice transfer (improved management)</td>
</tr>
<tr>
<td></td>
<td>(b) Water resource benefits (including improved security of supply)</td>
</tr>
<tr>
<td>Severn Trent / South West (1996)</td>
<td>(a) £30 million ($44 million) p.a. opex savings within five years</td>
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<td></td>
<td>(b) Best practice transfer (‘radical transformation’ in South West management)</td>
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<td></td>
<td>(c) Water resource benefits (through strengthening of the water supply grid)</td>
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<td></td>
<td>(d) Introduction of more effective sewage treatment programme</td>
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<tr>
<td>Wessex / South West (1996)</td>
<td>(a) £38 million ($56 million) p.a. savings (including £21 million ($31 million) in opex and capex) within six years, leading to a 15% reduction in bills for customers</td>
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<td>(b) Creation of an exemplary comparator (and likely future benchmark)</td>
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<td></td>
<td>(c) Improvements to water quality and sewage treatment</td>
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<td></td>
<td>(d) Water resource benefits (including joint use of reservoirs and grid interlinkages)</td>
</tr>
<tr>
<td>Lyonnaise des Eaux / Northumbrian (1995)</td>
<td>(a) £3-11 million ($4-16 million) p.a. opex savings within four years</td>
</tr>
</tbody>
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| Table 2: The sizes of today’s English and Welsh water and sewerage companies |
|------------------|------------------------------------------------------------------|
| Measures of scale | Water-only companies | Water and sewerage companies (water) | Water and sewerage companies (sewerage) |
| Turnover (£m, 2008-09) | Min | Max | Min | Max | Min | Max |
| Number of connected properties (‘000, 2008-09) | 73 | 1270 | 576 | 3591 | 691 | 5538 |
| Length of network (km of mains or sewers, 2008-2009) | 907 | 14490 | 11461 | 46574 | 9178 | 68231 |
| Annual operating expenditure (£m, average allowance 2010-15) | 7 | 104 | 73 | 327 | 71 | 301 |
| Five-year capex programme (£m, 2010-15) | 14 | 390 | 294 | 1513 | 378 | 3400 |
| Modern equivalent asset value (£m, 2009 year-end) | 226 | 3882 | 2807 | 15002 | 4624 | 37738 |
the WaSCs’ dependence on state financing and brought a strong focus on reducing costs within the price cap. The state-owned Scottish Water has since also made large cost reductions under a tight price cap, which cannot easily be revised upwards. It has largely caught up with the private companies of England and Wales. It has been very helpful to the Scottish and Northern Ireland economic regulators, when setting price caps, to know what the private companies have already been able to achieve in England and Wales.

The current agenda: competition
There are current UK proposals for further consolidation, sharper incentives, more privatization, better regulatory information collection, and ‘negotiated’ regulatory settlements, i.e. proposals for continuing on the previous reform path. However, the focus for reform has now shifted to introducing competition. The reformers’ challenge is to foster competition to bring gains, without losing too much of the gain from the last 60 years.

Competition may raise financing costs for private water and sewerage companies. Placing activities beyond the scope of economic regulation and making them subject to competition implies that investors in those elements face increased risks. The business units may also be smaller. These effects will increase the cost of capital averaged across all activities. Equity investors have expressed concern that assets might become ‘stranded’, i.e. redundant when competitors enter. The industry is very capital intensive, and many assets have no alternative use, so this issue is a major design challenge.

Making a competition-oriented optimization of water organisations may lead to change, but technological and institutional innovations may also. For example, even without competition, the development of efficient small membrane treatment facilities, and of cheap information exchanges to co-ordinate real-time decisions by operators of reservoirs, treatment plants and networks, could mean that in many locations a geographically and vertically amalgamated organisation has a much smaller economic advantage.

Final observations
The UK’s experience over the last 60 years shows that striving to find the best structures for water and sewerage can bring large tangible gains. Even though a wide range of models can be seen around the world, and many local factors will be important in identifying the best water and sewerage arrangements for each place, the UK’s experience offers important general suggestions.

The improvements in the UK were enabled by amalgamations on a large catchment basis in the 1970s, which allowed for professional management, independence from local politics, and the exploitation of scale and scope economies. These brought gains in service and environmental quality, reductions in operating and capital costs, and lower customer bills. The continued improvements in the last two decades in the UK depended also on reforms to the policy, regulatory, operations, ownership and financing arrangements. These reforms clarified each party’s role, and sharpened their accountability for that role and their incentives to perform well in that role. They enabled low cost private finance to be raised.

The current proposals for further regulatory reform and for more competition show that UK water and sewerage organisations will continue to change. Eventually there will be lessons from this phase as well.


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EMASESA: the present of a company with a future

MANUEL JESÚS MARCHENA GÓMEZ, Managing Director of EMASESA, the water utility of Spanish city Seville, shares his vision of the activities that underpin his organisation’s success.

EMASESA (Empresa Metropolitana de Abastecimiento y Saneamiento de Aguas de Sevilla, S.A.), based in Andalusia (Spain), has over 30 years’ experience in the management of the integrated urban water cycle, supplying over a million people and covering areas with significant industrial activity. EMASESA currently supplies high-quality potable water to more than half the people of the province of Seville and over 10% of the population of Andalusia. We are one of the few Spanish companies that directly manage all of the processes of the integrated urban water cycle. EMASESA has an extensive infrastructure, including four reservoirs, three hydroelectric plants, one potable water treatment plant, 35 pumping stations, 28 storage facilities, five wastewater treatment plants (WWTPs) that treat 100% of the wastewater of the metropolitan area of Seville and which also manage the sludge from the treatment process by drying it in hothouses and composting for subsequent use in agriculture, 24 wastewater and 37 rainwater pumping stations, and two storm tanks. With a sanitation network totalling 3600 kilometres, we never lose sight of environmental sustainability. We are one of the few Spanish companies that directly manage all of the processes of the integrated urban water cycle. In order to deliver the best possible water quality and to minimise the impact of discharges, EMASESA has five laboratories accredited by ENAC (the Spanish national accreditation body) and six ISO 9001-certified laboratories. We are the company with the highest percentage of electronic meters and the only one with 100% electronic reading. Since its very beginnings, EMASESA has stood out for its innovative spirit and its firm, long-term backing for the application of ground-breaking technical and technological solutions.

Our revenue in 2009 came to €108 million ($132 million), with investment up by €48 million ($59 million) as a result of increased work on sanitation networks and facilities and investment in the new Ranilla WWTP, which cost €35.5 million ($43.5 million), as well as investment in intellectual capital, new knowledge, and research, development and innovation (R&D&I) projects.

Offering a better service to our most important asset, our customers

EMASESA has customer service points in all of the areas served—seven offices and 23 public service points—as well as customer service via all possible communication channels, including a 24/7 telephone service and a website, which is one of the most highly-regarded in the sector in Spain (www.aguasdevsevilla.com). It is a participatory website with technological tools such as forums, surveys, etc., which makes us an ‘organisation 2.0’, barrier-free, where information flows in both directions between the company and its customers. Our customers express a level of satisfaction of 8.7 out of 10 for our personal service, and the trend is clearly upwards.

Excellence and positioning

Our objective is excellence in the service we provide—a quality service with maximum customer satisfaction. EMASESA has a specific policy for its relationships with each interest group with which it engages and is a pioneer in the active participation of society in its management bodies, to which end it has brought representatives of the public into the company’s decision-making organs. Notable joint actions that have been undertaken include the implementation this year of a new invoicing model at EMASESA, unique in the sector, based on the application of varying charging bands, which correspond to the number of inhabitants in each dwelling, applying criteria of sustainability and greater fairness. I believe that these facts confirm our position in a market where we are opening up the path for others to follow.

On the demand side, the use of water-saving devices has been promoted and we have run awareness-raising and public participation campaigns. Programmes aimed at reaching out to the business sector are fundamental for this, as are regulations, the appropriate metering equipment (electronic meters), audits and the re-use of treated and domestic water.

In recent months, EMASESA has attended the Water Utility Conference – Strategic Opportunities for Future Challenges, organised by the Agbar Foundation and the International Water Association (IWA). At this edition of the conference, we worked closely with international, cutting-edge companies active in our sector, sharing experiences and projects. It is not for no reason that EMASESA has consolidated itself as the leading water utility in Andalusia and the second largest publicly-owned company in Spain, guaranteeing a high-quality public service in the management of the integrated urban water cycle for all users, without distinction.

Likewise, I should like to underline the quality and dedication of the personnel of the company. Between all of us, we have managed to build up and maintain a water utility which is 100% publicly-owned, which devotes its investment to the quest for excellence in the service of society and its customers, which has a real
commitment to the environment with outstanding environmental programmes. A company which, despite the trend towards privatisation seen in the sector, is still one of Spain’s leading companies, as can be seen from its second place in the corporate reputation ranking drawn up by MERCO for the Entorno Foundation Award in the ‘Communication for Sustainability’ category, and from it having been selected as a finalist in the European Business Awards from among 3500 companies from different countries.

Resources

I should like to underline that the water supply comes from four reservoirs (Aracena, Zafre, Minilla and Gergal) located on the River de Huelva, an affluent on the right bank of the River Guadalquivir, and a fifth reservoir (Cala), which is on the River de Cala and is, in turn, an affluent of the River de Huelva, into which it flows upstream of the Gergal reservoir. The total storage capacity of the first four is 395 cubic hectometres and that of Cala 8 cubic hectometres. The latter is used for the generation of electricity and its water is then used for supply.

Fortunately, the water from the reservoirs is of very good quality with very low mineralisation, as we are located in a very stable geological area, which also has a very sparse population and little agriculture or livestock farming. In all events, the Carambolo water purification plant is able to solve any problems which might arise.

We must not forget the main problem affecting this region, which are the periodic droughts we suffer as a result of our geographical location, but which we hope to palliate with the water-saving and efficiency measures that we have implemented since the last period of drought (1992-95). These measures have allowed us to reduce considerably the amount of water transported and distributed. We now also have the new Melonares reservoir, which helps to guarantee supplies.

Innovation and energy

At EMASESA, we are aware of changing market forces and how market activities provide wellbeing to the public. Consequently, we consider technological R&D&I key for our business and we hope to be able to perform its functions competitively and with maximum efficiency. I can confidently state that we at EMASESA, through efficient management and R&D&I projects, have opted to be different, offering the market innovative products and services as part of our ongoing quest for excellence.

Here, we should highlight the Aqua R&D&I project, a set of information systems whose purpose is to bring innovative management methods to water utility companies, or the Supercritical Oxidation project, which uses supercritical oxidation to eliminate sludge from WWTPs. This treatment has a very specific final purpose, achieving significant environmental advantages, since it is a complete solution to the problem of the elimination of waste from WWTPs.

We firmly believe that our company possesses the spirit, the organisational structure and the resources necessary, together with experience and knowledge, to meet all of the challenges and contingencies facing a sector which is currently undergoing profound changes. This is why EMASESA looks to continuous innovation and diversification as a business strategy.

The main objectives of EMASESA’s strategic plan are the development of new business and the opening up of new markets, such as renewable energy. In this strategic plan, one of our main objectives is the development of new business and opening up new markets and revenue sources, such as renewable energies, through photovoltaic solar energy (1000 kW solar photovoltaic plant at the Copero WWTP) and photovoltaic installations at storage facilities and on buildings (1500 kW). We should also mention the cogeneration of biogas (four WWTPs, 3200 kW) and mini-hydroelectric plants at the reservoirs: Aracena (4570 kW), Zafre (4537 kW) and Minilla (2170 kW).

EMASESA’s energy situation is very interesting. With a single director and highly-qualified upper management and personnel, we are ready to take the leap forward towards energy self-sufficiency. We have improved, above all, the supply and demand sides. On the supply side, we have worked on operations and maintenance practices within the system, the reduction of losses and leaks, the redesign of the system, and operations in WWTPs, and we have included water and energy efficiency as a criterion in the selection of projects.

Today, we also offer a broad catalogue of products, including: consultancy in wastewater management, design and installation of infrastructure, integrated management systems specific to water supply and sanitation companies (AQUAWS), mobility incident systems (GIM), communications networks, including both fibre-optics (HISPALNET) and digital radio-telecommunications (SECTOR), as well as a wide range of products too numerous to mention. As regards innovation, I should finally like to highlight DeSevilla, a flavoured, bottled water from our own supply network in an exclusively-designed, high-quality glass bottle. It confirms the excellent quality of the water supplied on our public distribution network and makes us the first Spanish water utility to launch a project of this kind.

Objectives for the future

At this point, I should like to draw attention to EMASESA’s objectives for the next decade and I should like to reiterate that our vision is to be a publicly-owned beacon company that respects certain basic principles based on the excellence of the service provided (we have eight offices and 16 customer service points, as well as a 24/7 telephone line), meeting the current and future needs of our customers and shareholders and promoting research, development and innovation. And all of this, in the public service.

I should like to emphasise our efficiency in resource management, a field in which we always act in accordance with criteria of sustainability. We guarantee the supply of water of the required quality, we keep our supply reservoirs in good ecological condition, we take advantage of positive environmental externalities, we reduce the environmental impact of our operations and, finally, we discharge our water into the receiving environment under conditions that cause no impact.

Cooperation and coordination with other public services, administrations, institutions and organisations of the metropolitan area of Seville also form an important part of our horizon, without forgetting the profitable exploitation of our technical resources and assets through new lines of activity and the expansion of EMASESA Metropolitana.


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Funding mechanisms for investments in the water sector

Water utilities basically have access to three types of financial products in order to fund capital expenditure. Lars Anwandter reviews these options and looks at how the different financing options have been used in the reforms that have been underway in the Italian water sector.

In many countries of the world the funding sources for investments in the water sector have gradually moved from general taxation to specific user tariffs. In the European Union (EU) this shift has been supported by the Water Framework Directive (EC 2000/60), which established the adoption of cost-covering tariffs as one of its key principles to ensure an efficient use of water (based on ‘the user / polluter-pays principle’).

In addition, the limits on national public deficit and debt levels imposed on the countries joining the Euro in 2001 (the ‘Maastricht criteria’) suggested to policymakers that, whenever possible, the public sector should avoid operating and indebted itself in sectors in which, as with the provision of water and wastewater services, they could generate cost covering revenue streams by themselves. As a result, public water departments have been transformed into independent public, private or mixed public–private utilities. This article illustrates which financial instruments and products are available for similar utilities in the EU to fund the large capital investments required by the EU environmental directives (e.g. regarding water quality standards for potable water provision, and wastewater collection and treatment).

The importance of regulation: the link with the cost of funding and tariff level

Since the provision of water and wastewater services is a natural monopoly, and considering the positive and negative externalities and social sensitivity of the sector, the need for a public regulator is obvious from an economist’s point of view. Even Milton Friedman, notoriously known to be in favour of free market forces, wrote in his book ‘Capitalism and Freedom’ that the provision of water services should be regulated.

Regulation is crucial to protect consumers from rent-seeking behaviours of water service providers, be they private or public. Without control by a regulator, private operators will be tempted to maximize profits and dividends, while public operators will tend to grow their labour force, resulting ultimately in inefficient operations.

Regulation is also important for another reason that features less prominently in economic literature: a good and stable regulatory framework can significantly reduce the cost of capital to fund the investments in the water sector. Instead of asking the question ‘How much does regulation cost?’, policymakers should ask themselves ‘How much can society save in terms of the cost of capital by establishing a solid and clear regulatory framework?’.

Instead of seeing regulation as a constraint, utilities in the water sector should see it as an opportunity to attract private finance. In particular, a stable and transparent regulatory framework has a double benefit in terms of the weighted average cost of capital (WACC): it reduces the risk premium requested by private investors and increases the degree of leverage (debt / equity ratio) that senior lenders are willing to accept. Since interest expenses are tax-deductible, an increase in leverage results in a reduction of the average WACC.

The WACC is important since the water sector is highly capital-intensive. According to an analysis presented by Guido Borsani for the company Finlombarda, which forms institutional policies for the regional economic and social development of the Lombardy region in Italy, the ratio of capital to revenues in the water sector (3.5x) is significantly higher than for other local public services like gas (1x) or electricity distribution (1.7x).

As a result of the above, the cost of capital in the water sector represents a significant percentage of the average cost and tariff level. A low cost of capital therefore benefits consumers. As shown by a study of Professor Massarutto, illustrated in Figure 2, in the Lombardy region a WACC of 2% would imply a water bill equal to 2.8% of the average household income level for the low income population, while a WACC of 7% would increase the water bill to 4.9% of the income level for low-income households.

It is worth noting that in Portugal households for which the water bill represents more than 2% of their average income level have the right to benefit from a social tariff. This is not only a social issue, but also a potential problem for the utilities providing the service. When or if the water bills become excessively high, users start delaying payment or pay less, and bad debt levels start accumulating. It is therefore also in the interest of the utilities to develop tariff structures that ensure the social affordability of the water services.

Different forms of funding

As illustrated in Figure 3, in order to fund the required capital expenditures, utilities in the EU have basically access to three types of financial products (in order of increasing complexity, risks and pricing):

- Fully public funding / guarantees;
- Corporate lending by banks;
- Project finance lending to special purpose vehicles (SPVs).

The main features of these three options are described below.

Public funding / guarantees

Public funding of investments was the traditional financing mechanism of the sector. From an economic perspective, public funding make sense for projects with significant positive environmental externalities (e.g. the water basin investments implemented by the ‘Agences de l’Eau’ in France) or in case of regional and social disparities (e.g. the public funds allocated to the water sector of the Italian ‘Mezzogiorno’). From a financial perspective, public...
funding or guarantees make sense for small utilities that have trouble accessing private financing through banks or bonds, or for utilities in difficult areas with high non-payment and low collection rates and/or for SPVs that are in the start-up phase. The challenge for policymakers nowadays is to use the scarce public funds in an efficient, sustainable and transparent way, in order to ensure that they will not crowd out, but rather attract private financing. In addition, public funding or guarantee mechanisms should be designed in a way that ensures that the need for public support falls over time, thereby giving dynamic incentives to the sector to become more and more self-sustaining.

One example of a smart use of public funds to finance investments in the water sector are the State Revolving Funds (SRFs) set up by the Environmental Protection Agency (EPA) and the State governments in the USA. As illustrated in Figure 4, the resources provided by the public stakeholders are leveraged by issuing bonds on the private capital markets linked to the municipal water infrastructures, which are then re-paid out of the proceeds of the water bills. The main advantages of the SRFs are that—many small municipal operators with investment needs (which individually would have problems approaching private funding) are combined at the State level; and public money is used as an equity cushion to leverage private finance by guaranteeing the issuing of bonds.

Corporate lending
Corporate lending does not depend on the ownership structure of the company and is hence available for fully public companies (like in the Netherlands or in Germany), fully private utilities (like in the UK and in France) and mixed public-private companies (like in Portugal and Italy). Corporate lending does however require utilities of a certain size. The reason is that banks will dimension their corporate loan based on the level of equity of the company (up to 30-50%). Undercapitalized companies (as is the case of many water operators in Italy) will hence have difficulties in attracting significant amounts of corporate lending and will require either public guarantees or will have to structure a project / concession finance operation (see below).

The analysis of the creditworthiness of a corporate company depends primarily on the business sectors in which the company operates, on its competitive position, the regulatory framework and concessions, the company’s governance, organizational structure and strategy; the experience of its management, the level and stability of the cash flow generated by the various business activities, the solidity of the balance sheet structure, the profitability ratios, the projected investment and funding requirements, and the historic and projected debt service coverage ratios.

The cost of corporate lending (the risk premium) is linked to the probability of default of the utility, which in turn depends on the term of the loan (average life) and on the rating level of the corporate company (typically for water companies ranging from a maximum level of A down to one notch below investment grade: i.e. BB+). Some borrowers have an external rating level (from the ratings agencies Standard & Poor’s, Moody’s and Fitch), which can be used in finance contracts to establish step-ups of the risk premium (if the rating level deteriorates), as well as the minimum acceptable rating levels, before a potential event of default is called.

In the absence of an external rating, a comparable internal rating level can be elaborated and assigned to the utility by the lender based on an ad-hoc financial analysis. This analysis will review the overall creditworthiness of the company based on the criteria outlined above and calculate (historical and projected) financial ratios of the company. The main financial ratios that are generally considered are: earnings before interest, taxes, depreciation and amortization (EBITDA) / interest expenses; funds from operations (FFO) / interest expenses; FFO / debt; debt / EBITDA; and debt / equity. A couple of these ratios can be used in finance contracts to define the minimum (e.g. FFO / debt) and / or maximum (e.g. debt / EBITDA) acceptable level of these ratios, before the risk premium is increased and / or a potential event of default is invoked.

One key distinction in corporate lending occurs between multi- and mono-utilities. In the case of multi-utilities the lender does not analyse only the water investment and operations and the specific projects / concessions in this sector, but considers all the businesses of the borrower (the entire consolidated balance sheet and income statement across all the concessions). In the EU many multi-utilities exist that operate also in the water sector and that have an external rating level (e.g. Veolia and Suez in France, Acea, A2A, Hera in Italy, RWE in Germany).

For a mono-utility (water and wastewater only company), the corporate financial analysis is instead in some aspects similar to the financial analysis of a project / concession finance operation. One difference is that a corporate company already has an existing client and asset base and cash flow. Also, it may operate various water concessions in different geographical areas, so that the financial analysis will concern all the activities of the borrower (and not only the cash flow generated by the specific project / concession being financed).

Outside the UK (which privatised the entire sector in the 1990s and at present has numerous rated water and wastewater corporates), only relatively few rated mono-utilities exist in the water sector (e.g. Agbar rated A by Standard & Poor’s, Acquodotto Pugliese rated BB+ by Standard & Poor’s). The cases of the UK and of Portugal illustrate how a solid regulatory framework can benefit corporate lending in the water sector. It has helped the UK and Portuguese water companies to increase their access to private financing, their debt / equity leverage ratio and thereby their return on equity. In total the UK companies have managed to raise €100 billion ($123 billion) for investments in the water sector without any recourse to public funding.

Project finance lending
Project finance lending is primarily based on the stability of the projected future cash flows of the investments financed. Two types of project finance operations can be distinguished in the water sector: the financing of a single capital-intensive new asset in the value chain, as for example a wastewater treatment plant (WWTP), repaid through a fixed availability fee by the conceding party and / or from fees by

![Figure 2: Effect of return on capital on water tariffs (Lombardy region). Source: Professor Massarutto, ‘La legge Galli alla prova dei fatti’, Milan](image-url)
users of the WWTP (standard project finance operation); and the financing of a series of small and medium-sized facilities included as part of an overall investment plan under a concession agreement between the concurring party and the water concessionaire (known also as concession finance).

In a standard project finance operation, the grace period of the loan generally coincides with the construction phase of the ‘greenfield’ asset and the debt repayment occurs when the free cash flow becomes positive and allows adequate debt service coverage to be achieved. In both cases the term of the loan is defined by the economic life of the assets financed and / or by the duration of the concession. In both cases the key document to evaluate the creditworthiness of a project / concession finance operation is the concession contract, which includes the risk allocation among the concurring party and the concessionaire. Its key components are the following ones: it has to define and explain the concept of the ‘economic and financial balance of the concessionaire’ by linking it to the cash flow debt service coverage ratios; establish a rebalancing mechanism of the economic and financial equilibrium through tariffs, or through a review of the investment obligations and / or of the term of the concession; and determine what happens if a series of exogenous and / or endogenous events occur during the life of the concession, covering also the cases of early termination of the concession contract.

A fair and efficient risk allocation consists of allocating to the concessionaire (and the private financiers) all the risks that they can anticipate, manage, reduce and / or that are under their control (e.g. the risk of delays in construction caused by the construction company, the risk of an inefficient use of the inputs, the risk of low billing and collection rates, of higher personnel costs, the interest rate risk). All events that are beyond the area of influence of the concessionaire should be allocated to insurances or to the public sector (e.g. the risk of delays in construction due to missing permits, lengthy expropriation procedures, an increase of the unit prices of key inputs like energy, insurance premia and chemicals, the risk of events of force majeure occurring, the risk of early termination of the concession due to public interest or default of the concurring party). Finally, it is very important that the amount of the indemnity – to be paid to the concessionaire in case of early termination – is very clear, as well as the timing, payment mechanism and the counterpart in charge of this payment.

The Italian water sector: a case study

With the approval of the Galli law in 1994 the Italian water sector started a reform process, whose main objectives were to reduce the fragmentation and achieve economies of scale in the water sector, by aggregating the more than 8000 individual water companies to optimal water management areas (ATOs), and to create incentives for private operators and banks to fund investments in the sector by allowing tariffs to cover operating costs, depreciation and a fair rate of return on capital. Over the past 15 years, 91 ATOs were created by the Italian regions and the service has been awarded in 68 of them: 31 on an in-house basis, six to a purely private mono-utility, 12 to a mixed public-private mono-utility, 13 to multi-utilities listed on the stock exchange, and six in a transitory non-permanent way. In addition, a series of mergers have taken place, such as the ones of the multi-utilities of Milan and Brescia (Aem Milan SpA and Asm Brescia SpA merging into A2A SpA), of Turin and Genoa (Aem Turin SpA and Amga Genoa SpA merging into Iride SpA), of Parma, Piacenza and Reggio Emilia (resulting in Ena SpA) and of Iride and Ena into Iren SpA. Even if slow and concentrated mainly in the north of the country, the desired agglomeration process has hence in part taken place.

The private funding of investments in the sector has instead lagged behind. While financing needs are estimated to amount to €2 billion ($2.5 billion) per year, actual investments are considered to be less than half, funded primarily by the operating cash flow and by public subsidies, and only to a minor extent by debt.

For example, corporate loans have been obtained by 14 ATOs and can be divided between:
- Multi-utilities operating in the following two ATOs: Brescia (A2A SpA, rated A-/BBB+ by Moody’s / S&P, ex-Asm Brescia), Genoa (Iride, now Iren, not rated), Trieste and Padova (Agecas-Aps), Parma, Piacenza and Reggio Emilia (multi-utility Ena, now Iren, not rated), Bologna, Modena, Ferrara, Ravenna (Hera, rated A/BBB by Moody’s / S&P), and Rome (Acea, rated A/A by Fitch / S&P);
- Mono-utilities operating in the following two ATOs: Turin (Smat, not rated) and the Puglia region (Acquedotto Pugliese, rated BB+ by S&P through a corporate bond).

Project / concession finance operations have instead been concluded – following a start-up phase of the new operators of four to five years – in five ATOs:
- Three by mixed public-private companies constituting public-private partnerships (PPPs): the first one was Nuove Acque SpA of Arezzo (in 2004) with Suez as the private partner, followed by Acquataliana di Latina with Veolia as the private partner and Acque SpA of Pisa with Acea as the main private partner (both in 2007);
- Two by fully public in-house companies, i.e. ACAM Acque of La Spezia (in 2007) and Iraisacqua of Gorizia (in 2008).

However, in approximately 50-60 ATOs out of 91 existing ones, the situation regarding the private financing of investments remains very unclear. In approximately 20 ATOs no concessionaire has yet been chosen, while in the existing 31 in-house concessions a review of the original award process or a privatization of 40% of the shares is needed according to the recent Ronchi law (Law Nr. 166 of November 2009) by the end of 2011. In particular, the ATOs of ‘Mezzogiorno’ (Sicilia, Calabria, Basilicata, Molise, Campania), as well as the rural non-metropolitan ATOs with limited population density / sizes (e.g. in the central regions – Umbria, Marche, Abruzzo – but also in the north – Veneto, Lombardia, Piemonte) are likely to have difficulties in raising the private long-term funding required to cover the investments needs.

It is therefore important that Italy uses the scarce public funds available in the water sector efficiently. If and whenever possible, this should employ the use of private funds (e.g. following the example of the SRFs of the USA). In addition, at the example of the UK, Portugal and France, in order to increase the amount and reduce the cost of private financial funds, Italy should aim towards improving the transparency, clarity and stability of its regulatory framework of the water sector.

In recent times there have been
numerous and significant changes regarding the award mechanisms of the water concessions (resulting in the Ronchi law of November 2009) and the role of the local regulators (known as AATOs, which according to a recent decree have to be reformed by the regions by March 2011). In particular, it would be useful to create a national regulator and tie the transfer of public funds for the water sector to the adoption of a standard concession contract and of a standard financial model, with the aim to improve the degree of transparency and hence the ‘bankability’ of operations in the sector.

Conclusions
The countries in the EU in which utilities have been most successful in attracting private financing for the water sector are the UK, Portugal and France. The cornerstone to attract private investors in the water sector, achieving high leverage levels and a low cost of capital, has been the regulatory framework.

The UK has chosen a regulatory model with a respected and well-staffed centralized national water authority (‘institutional regulation by authority’). The latter reviews the investment plans and service quality levels every five years, and regulates the tariff and efficiency levels of the fully-private corporate companies. These private companies, which also own the assets, have obtained external investment grade rating levels and have not had problems in accessing banks and capital markets.

France has instead selected the model of ‘bilateral regulation by contract’, based on a concession contract, with a clear risk allocation among the municipality and the concessionaire, following an affermage scheme (leasing). While the assets remain public, they are leased to private companies (like Suez SpA and Veolia SpA) through a service contract awarded at the municipal level. In addition, in France, a significant amount of public funds remains available from ad-hoc water user taxes collected by the ‘Agences de l’Eau’. The latter reinvest these resources in important facilities that facilitate the achievement of desired water and wastewater quality standards.

Portugal defined a clear strategy for the water sector in 1993, clarifying the institutional responsibilities, creating a national regulatory authority, promoting new governance models and a territorial reorganization (among bulk water suppliers and municipal distribution companies) and full cost recovery. This has allowed the water companies to access private funding. Rather than discussing whether the UK, Portuguese or French regulatory framework is the better one, it is worth emphasizing that these countries have maintained a clear and stable sector policy over many years, allowing the private operators to adapt to the chosen framework in an efficient way. Since 1993, Portugal has maintained a high degree of political commitment to reorganize the sector. The same cannot be said for Italy, which started the reform process of the water sector at a similar point in time (in 1994) but is currently lagging behind.

In addition to a solid regulatory framework, a coordinated national strategy to implement the required investments in the water and wastewater sector would also be desirable. The main reasons why utilities in the water sector could benefit significantly from a strong public sector support for investments are the following ones:

• A high degree of fragmentation amongst the various operators continues to exist in many EU countries. A national public sector investment strategy could combine the investment plans of the various operators in order to achieve ‘financial economies of scale’. This would allow to organize common negotiation tables, instead of having individual discussions with each operator;

• A standard concession contract and financial cash flow model could be developed at the national / regional level, in order to ensure the bankability of the individual concessions / projects;

• Public grants / funds could be centralized at the national / regional level and transferred to the local level, but only if reforms improving the financial sustainability of the water operators are being gradually implemented.

In terms of the public funding mechanisms for private utilities, it is important to use the public resources efficiently. For example:

• In order to help the development of concession / project finance operations in the water sector in a country, the loan to a SPV could be initially guaranteed by a public sector entity (nation / region / municipality), with a release of the guarantees after the start-up period has passed and when the project has reached adequate debt service coverage ratios;

• In order to increase the private funding of small- to medium-sized water corporate companies with low levels of equity, a public ‘first loss guarantee fund’ could be established, which insures lenders and private investors against a certain percentage of their losses.

Complex and sophisticated funding mechanisms are generally possible in stable regulatory frameworks (like the ones in the UK and Portugal) or in well-structured project finance operations (like the water PPP of Pisa in Italy, which created a ‘project-specific’ structure that complements the overall framework). When risks are allocated in an efficient way among the main stakeholders, less guarantees are needed, more private funds are obtained for investments, and the risk premium requested by banks / investors is generally lower.


Notes
1. One example of a standard finance project in the water sector is the Delfland WTP in Holland (an investment of approximately €320 million ($394 million), serving 1.2 million people). On the basis of a 30-year concession, the banks provided a 27-year loan repaid from fixed payments of the conceding party.

2. Note that the degree of stability of the regulatory framework is in a certain way a more important feature than the degree of optimality. The reason is that private operators can adapt to a country with a stable albeit sub-optimal framework, while they are likely to be less prone to invest in a country in search for an optimal set-up but with a continuously changing framework.

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This article is a summary of a paper we wrote in the context of a broader research project designed by the Bank of Italy to examine the regulatory reforms of Italian local public services. Our information sources include two surveys carried out in 2007 on local public water authorities and local water service providers.

In 1994 the Italian water sector was redesigned by the so-called Galli law, which represented a huge reshaping of the regulation. Previously, every single municipality (about 8000) was charged with the provision of water, directly or through municipally-owned companies. The result was a small territorial scale, dispersed know-how, tariffs unable to cover production costs, and a reduced level of investments financed by central government transfers.

The reform was founded on two pillars: the separation between actual operation and control and the industrial perspective in the provision of the service. Regions were called to design ‘optimal local areas’, based on the geographical scale of river basins, to be put under the control of local water service regulators, which are associations of the local authorities (provinces and municipalities) located within the area. Vertical integration was achieved by a unique provider for water distribution, sewage treatment and disposal. Tariffs were designed to recover the full cost, and the assignment of the service was based on a ‘competition for the market’ approach. The Galli law anticipated many issues of the Water Framework Directive issued by the European Union in 2000. However, the actual implementation of the reform took a very long time and diverted in some aspects from the original picture.

Restructuring the sector

As to the assignment of the service, the law itself partially denied the competition principle from the very beginning: a safeguard clause allowed the incumbent operator to maintain the provision of the service if a number of conditions were met. The safeguard clause allowed different providers to operate in the same area, thus weakening the expected effects of vertical integration. This, coupled with a widespread use of the ‘in-house’ solution (where the provider is basically a ‘branch’ of the local government), allowed by a subsequent amendment to the law, resulted in a large preservation of the status-quo. In 2008, 52% of the providers were public companies already operating before the reform, 40% were old providers with a new (private or public) partner, and only 8% were new providers.

Optimal areas should have been defined according to the extent of the river basin, but this was not always the case. The criteria adopted were instead often based on administrative boundaries. The creation of local regulators, as well as their functioning, was in many cases quite a challenging task. Investment programmes, according to the law, had to be defined by local regulators after an inventory of the state of the existing infrastructure. Given the poor state of the network, these investment programmes were in most cases unrealistic and gave rise to frequent

‘There is little doubt that the reform fostered a massive shift in the Italian water sector… but… the implementation of the reform took a very long time and, to some extent, diverted from the original design.’
Revisions to the contract after the assignment of the service. As a matter of fact, providers should have been able to fund investment programmes through their own revenues, but these turned out to be much lower than initially forecast as projections were based on overestimated water consumption.

Local regulators are a novelty for Italy; in 2008 there were about 100 in the water sector. On the one hand, being close to the provider they are expected to improve the quality of the regulation, but on the other hand their organization may be expensive. We tried to estimate the operating cost of these regulators, which on average turned out to be €0.92 ($1.10) per capita. The expenses are mainly composed by staff costs (40%), goods and services (30%), and board compensations (25%). A regression analysis highlighted significant differences between the north and the south of the country (cost is lower in the north) and a negative impact of population size, indicating that the expenses are mainly relevant dimension. We used fund investment programmes through themain indicators for 2006. Water services are capital intensive. Fixed assets are, on average, two thirds of total assets. Financial structure proved to be well balanced (equity and long-term debt exceeded net fixed assets), and the leverage is low, at least for Italian standards (half debt, half equity). The key point is the very low turnover – the value of the production is one quarter of the total assets. Thus in turn generates a modest profitability as the return on equity is lower than the risk-free interest rate (e.g. the one on Treasury bonds) for half of the firms.

Measuring efficiency

Finally, our (pivotal) issue was the measurement of the efficiency of the providers. We had a look at the performances of the group of firms to which the regulators assigned the integrated water service in the optimal areas (73 operators that returned information on their cost, out of 102). Efficiency could be assessed either through parametric or through non-parametric methods. We opted for a non-parametric one, the Data Envelopment Analysis (DEA), which avoids making arbitrary assumptions and is flexible enough to adapt to the peculiarities of the water sector. Indeed, the method does not allow results to be extended to all operators (i.e. to those not included in the sample). Also, conclusions may be affected by anomalous data, so robust checks were carried out.

The output of DEA can be a very useful instrument for implementing a comparison between different providers (benchmarking approach). DEA is able to disentangle two types of inefficiency: inefficiency due to the size of the firm (scale efficiency) and inefficiency related to the optimal combination of production factors (technical efficiency). Furthermore, DEA allows inputs to be treated differently according to whether they can be varied by water service operators (discretionary inputs), or whether they cannot (non-discretionary), which proved to be very useful in this context. Also, the assessment was based on the minimization of inputs for a given output, as opposed to the maximization of the output for given inputs. This is preferable as water use cannot be expanded at will, nor is it advisable. The output variable used in the analysis is the water delivered (introduced in the pipeline), discretionary inputs are staff, materials, services, and depreciations, and non-discretionary inputs are the length of the network, the type of the water source, and the percentage of water losses.

The main result of DEA is that efficiency related to the firm size is adequate for most of the firms, while technical efficiency exhibits a high variability. The problem seems then to lie in the combination of the inputs and not in the scale of the production. These results are not changed by excluding extreme observations or using a different definition of output (water actually sold, instead of introduced in the pipeline). As a matter of fact, considering water sold instead of delivered should be a way of measuring efficiency that is more compatible with providing an incentive. Only during the first few years from the service assignment can losses be considered as a non-discretionary input, while later on providers should be able to improve the quality of the pipeline through investment.

A second step analysis on DEA results highlights that that multiutilities (firms operating also in at least one other sector amongst electricity, gas and urban waste) seem to have a higher scale efficiency than monounitities. This might show that, as far as the production process is concerned, there is no particular role for economies of scope between water sector operations and other public utility sectors, apart from the possibility of lowering administrative costs.

Conclusion

All in all, what do our findings suggest? There is little doubt that the reform fostered a massive shift in the Italian water sector, led by an industrial perspective that promoted a larger scale of operations supervised by a network of local regulators. But, on the other side, the implementation of the reform took a very long time and, to some extent, diverted from the original design. The competition mechanism ended up being weaker than expected, because of the original safeguard clause and of subsequent amendments to the rules of provision assignment. This resulted in incumbent operators still playing a major role. Moreover, full-recovery cost tariffs and plans set up by local regulators did not prove to be effective in supporting the large amount of investments needed.

The efficiency analysis showed that the efficiency connected to the firm size is high and similar among operators, but efficiency linked to the optimal combination of production factors is quite disparate. This suggested that there is room for efficiency gains through the introduction of comparative competitive mechanisms, such as benchmarking or more advanced yardstick competition. The idea is that a larger regulation scale could be achieved by implementing a comparison between local providers.


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Water pricing review: surveying affordability and recovery of costs

The Organisation for Economic Cooperation and Development has released a report setting out the results of its 2007-08 pricing survey. KEITH HAYWARD reports.

A new report prepared by the Organisation for Economic Cooperation and Development (OECD) seeks to provide an updated picture of the pricing of water resources and of water and sanitation services, both amongst and beyond its member countries.

In particular, ‘Pricing water resources and water and sanitation services’ presents the results of the OECD 2007-08 water pricing survey. This survey was intended to provide answers to two questions. Firstly, it sought to establish what proportion of the costs related to providing water and sanitation services is recovered through the tariffs levied on users of the services. Secondly, it sought to establish whether the average tariff levels levied are affordable to all of those receiving the services.

Why is pricing an issue?

The report begins by providing the context for these questions.

It highlights the dual role of pricing. Given the increasing scarcity of water resources, pricing has a role in ‘directing water where it is more valuablely employed’, and helping manage demand. Alongside this, it also has a revenue raising function.

The report then explores what needs to be taken into account when establishing just what the costs involved are. What it describes as ‘full supply costs’ comprise operation and maintenance costs, capital costs, and the cost of servicing debt. But there are wider costs to consider – the full economic costs additionally include opportunity costs, which are those costs incurred when a resource could have been put to a higher value use and are the ‘costs experienced by society due to this misallocation of resources’. There are also economic externalities to be considered, which might for example be either positive or negative impacts on the environment whose costs are not otherwise taken account of.

These costs need to be covered if water and wastewater services are to be supported in the long run, but the report points to the concept of ‘sustainable cost recovery’ (SCR) rather than full cost recovery. This concept was introduced by the Camdessus report (Winpenny, 2003). The report explains that SCR has three main features.

Firstly it embraces the use of the ‘3Ts’ of tariffs, taxes (channelled as subsidies from local or national government), and transfers. These sources can be used to finance operational and capital costs and to leverage other forms of financing. Alongside this, SCR involves predictability in public subsidies, and the use of tariff policies that at the same time ensure affordability to all and financial sustainability of the service provider.

The report notes that the ‘3Ts’ each have different characteristics, but that there are reasons for preferring tariffs. It notes that ‘investors and financiers may perceive the reliability of the three revenues streams differently’. It therefore states that: ‘What matters in prices’ contribution to sustainable cost recovery are: (i) their average level; (ii) the reliability of their flow and of their automatic adjustments (e.g. to inflation); and (iii) the flexibility in adjusting them to unforeseen circumstances (e.g. exogenous shocks, such as a devaluation or a surge in the price of a critical input).’

The report also highlights that water policies have to balance four sets of objectives: financial sustainability; environmental sustainability; social concerns; and economic efficiency. This therefore leads to a number of tensions, such as the need to balance financial sustainability with economic efficiency, and the need to balance social concerns regarding affordability with the financial sustainability of water operators. These tensions make tariffs an important issue.

The current state of play

The report then presents the core data of the survey, and states that it provides ‘a set of robust and comparable data on water prices in selected OECD countries’.

It explains that an ‘extensive review’ of water pricing was carried out in 1999, and that this was updated in 2003, with the latest survey providing a further update.

The findings of the survey are summarised as: ‘The data show that, generally speaking, efforts are being made in OECD countries to better reflect the costs and externalities related to water use by households and industrial users. This is reflected in the deployment of abstraction and pollution charges, in the level of prices (which have increased, at times substantially, over the last decade) and in the structure of tariffs (which better reflect consumption and treatment costs).’

But at the same time the report highlights the need for caution in making comparisons between countries, stating that ‘extreme care should therefore be taken in proposing cross-country comparison on such variables’, and that ‘the different sources are not readily compatible’ and ‘to avoid aggregation of local data into national indicators’.

Water resources management

The report looks at water resources management. It notes that mechanisms used in this context include regulatory levies, pollution and abstraction charges or taxes, payments for ecosystem services, and permit markets. It sets out abstraction charges in selected countries, along with the features of both abstraction and pollution charging schemes in OECD countries.

The report notes that ‘abstraction charges tend to be relatively low’ and that ‘in most cases, charges are collected and retained locally’, although Mexico and Denmark are identified as locations where the revenue merges into general taxation. The report also notes that ‘not all countries levy abstraction charges on municipal water providers’.

Regarding pollution charges, the report notes that these ‘can represent a significant share of the water bill’ and that ‘more countries reported the use of pollution charges than abstraction charges’, adding that ‘in most cases, fees / charges are collected at the local level – but only seldom at the river basin level – to finance environmental activities.’

Domestic tariffs for water supply and sanitation

The report presents the unit price for domestic water supply and sanitation as ranging from $0.49 per m³ in Mexico to $0.70 per m³ in Denmark. This is based on the survey having sought to improve comparability of the information collected, asking respondents to base tariff data on the average bill for water supply and sanitation that a representative household consuming 15 m³ per month would pay.

The report also presents information on the variation of tariffs within both OECD and non-OECD countries. Such is the degree of variation that the report concludes that ‘the analysis of tariff levels needs to take place at the local level and that national and international benchmarking on tariff levels should be carried out’.
very carefully’. The report also presents information on unit price changes seen in various countries. Most countries reported average annual increases in unit prices, but the report notes that in some instances tariff increases have been driven by increases in VAT or other taxes and fees. Not only does this ‘make cross-country comparisons difficult’, but these taxes ‘can affect final demand and the affordability of services, but do not contribute to cost recovery’.

The report then reviews tariff structures for water supply, sanitation and industrial water. Regarding tariffs for water supply, the report highlights the diversity that exists, even within countries. Austria and Mexico are cited as examples of countries where tariff structures are set at the municipal level. A synthesis of findings is presented, but the report notes that ‘this information is not comprehensive’ as tariff structures are often set at the local level and ‘are not consistent within a country’. But the report does go so far as to say that, compared to the previous OECD survey, few countries now use flat fees or decreasing block tariffs. The report also points to the use of localised setting of tariffs but within a framework of centralised control, such as in Italy, the Czech Republic and Portugal, with Portugal presented as a case study.

The survey also reports an ‘emerging trend in some OECD countries’ of the increasing use for weight of fixed charges alongside volumetric components, ‘driven by providers’ attempts to improve financial sustainability’.

Regarding wastewater, the survey found that, increasingly, separate wastewater charges are being applied, generally with separate charges for sewerage and for wastewater treatment, with charging generally on the basis of water use. The survey also looked at connection charges, and found that ‘the computation of one-time connection charges for water supply and sanitation services is the area where the most marked differences were found across providers in terms of criteria used and levels applied’.

The report concludes that real prices have tended to increase, that increasingly separate sanitation charges are made that may lead to substantial price increases, and that fewer countries are reporting use of decreasing block tariff and flat-fee systems.

Policy challenges

The report then provides an assessment based on the survey results and turns to answering the questions set out in the first chapter of the report.

‘It starts by reiterating the importance of pricing, given the increasing pressures on water resources and the need for financing for the provision of water and wastewater services – financing that in OECD countries is generally required for the upgrading of existing infrastructure and improvements to wastewater provision, while in non-OECD countries often relates to more basic requirements. It also points out that the survey found very limited use of long-term marginal cost pricing, and found that metering is unevenly spread across OECD countries.

The report then turns to the central issue of cost recovery, as a key aspect in the financial sustainability in providing water and wastewater services. It concludes that ‘for domestic services, providers in most countries on average cover at least operation and maintenance (O&M) costs’. But the report notes that ‘responses to the OECD 2007-08 Survey on this issue were very sparse’ and that ‘responses may not be comparable’. Actual survey results are given only from Belgium, France, Portugal, Spain, Sweden, and the UK (Northern Ireland), so the report also presents results based on other sources.

The report expands a little further on this conclusion, but again with reservations: ‘Based on these data, the operation and maintenance costs of domestic WSS services are generally covered. However, there doesn’t appear to be a large margin for operators to also face the need to renew and replace ageing infrastructure, although very few countries provided data on this item: Finland, Luxembourg, Switzerland and Belgium are cited as examples of where efforts have been made to ensure the financial stability of the sector.

Having stated at the outset that the survey had been designed to establish what proportion of costs are recovered from tariffs as one of the central questions, it does therefore provide an answer – that operation and maintenance costs are generally covered but with little more above that – but the assessment is presented as being less robust.

The report then turns to the other central question – of whether the average tariff levels levied are affordable to all of those receiving the services. It does this initially by looking at bills as a share of disposable income. Compared to average net disposable income, figures range from 0.2% for Korea and 0.3% for Italy, Canada, Japan and Mexico, up to 1.1% for the Czech Republic and 1.2% for Hungary and Poland. The report concludes that: ‘Figures show that in OECD countries water supply and sanitation bills do not represent a considerable burden on disposable household income when using average income figures.’

The report goes on to assess bills in relation to lower incomes, comparing them to the average income of the lowest decile of the population. In this case figures range from 1% for Korea, 1.2% for Canada and 1.3% for Switzerland up to 4.2% for Hungary and Mexico, and 7.9% for Poland. It concludes that bills ‘would represent a significant share of disposable income in Mexico and in some Eastern European countries’. But it adds that ‘it is important to note that these figures do not represent what poor households actually pay, as most countries have introduced social tariffs’, citing a survey by Smets (2008) that showed that over 50 countries have put in place measures to address affordability problems.

The report therefore answers the second central question in what is a very general way, indicating that tariffs are broadly affordable. This is of value in the sense of evaluating whether tariffs are operating at a sustainable level for the population generally. But what it does not do is provide insight into any real hardship that might be being faced, particularly by those on the lowest incomes.

Need for improvements

The report concludes by suggesting ways forward. The nature of these reflects the reservations made in the report and the fact that the survey presented appears to be less than comprehensive.

The report calls firstly for regular updating of data. It then calls for improvements to the way data is collected. It notes ‘difficulties encountered in data collection’, highlighting the need for improved data collection at the local level and reducing inconsistencies in sampling and aggregation at the national level. In particular, it argues that experience calls for a rethink of the collection, analysis and presentation of tariff data at local level. It also notes that the current method for assessing cost recovery ‘asks for a lot of data and relies on uncertain definitions’. An alternative, says the report, might be to collect information about subsidies and transfers. Finally, it proposes that a checklist of questions should be developed for policy makers to consider when reviewing tariff policy.

References


Regulating to balance risk and reward –
financing of functions in the water industry

The economic regulator of the water industry in England and Wales has the task of controlling prices charged to customers but must at the same time ensure water utilities can finance their activities. Following the latest round of price setting, completed last year, Derek Holt and Suzanne Rab look at future issues around financeability.

As water companies now focus on the challenge of delivering the significant investment programmes agreed in the recent periodic review of drinking water and sewage services costs and prices in England and Wales (PR09) to time and budget, some of the rather arcane economic debates around the details of this review process may fade into the background for a time. However, given the depth of the recent financial crisis, and the questions this raises regarding leverage and refinancing risk, it is opportune to reflect on how the sector’s long-term financial viability may be secured. In particular, the sector is likely to persist in its cash negative profile, and potential changes to the regulatory framework in order to facilitate competition could create a need for a new perspective on the duty of the economic regulator to ensure the financing of water utility functions. Furthermore, while the sector’s financial profile has generally stood up to the challenge of the crisis, albeit with water companies paying higher spreads for credit and achieving shorter maturities, it should be noted that conditions can change significantly within relatively short spaces of time.

This article identifies the main factors which are likely to influence the debate on financeability in future water sector price determinations by the regulator, which are carried out on five-yearly cycles. Following a brief recap of the salient features of the current approach taken by Ofwat, the regulator of water and sewage services in England and Wales, it reflects on questions such as how financeability is dealt with in other sectors, what risks firms should bear, the role of credit rating agencies, and, finally, how future challenges in the sector, including changes in the market structure, could impact on financeability testing.

Recap of financeability at PR09

Financeability, i.e. ensuring that water utilities can finance their activities, is a primary duty for the UK water regulator. Specifically, Ofwat has a duty to ensure that companies holding appointments as relevant water and water and sewerage undertakers ‘are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of the functions of such undertakers’.

Ofwat’s approach to financeability in PR09 represents an evolution of the procedures it had established in previous reviews to ensure that the price limits it was setting were sufficient to allow efficient companies to finance their functions. It has also been well trailed in advance, with an early decision on the overall framework set out in 2008 based on the results of the joint consultation exercise undertaken by Ofwat and Ofgem, the UK regulator of gas and electricity services, on the subject of financing networks in 2006. The essential components of the approach are as follows:

• A cost of capital (4.5% post-tax) was set uniformly for water and sewerage companies, with some adjustments for the smaller water-only companies in relation to the higher cost of debt they face.

• To test whether the proposed price limits were financeable, Ofwat examined the profile of a series of five financial ratios, including cash interest coverage (indicating the ability to make interest payments), gearing and cashflow:debt ratios, checking these are consistent with retaining an A-/A3 credit rating (and, in cases where one or two indicators do not meet this threshold, that they do at least meet the BBB+/Baa thresholds).

• A ‘notional balance sheet’ approach was taken, modelling companies’ financial position based on a notional gearing level of 57.5% rather than taking account of a particular financing structure put in place by individual companies. A proportion of this debt was assumed to be index-linked, consistent with broad industry trends.

• A dividend yield of 5% (compared to 5.8% at the preview periodic review, PR04) was used, reflecting the treatment of the sector as an ‘income’ stock while incorporating a proportion of retained income as a means to resolve financial constraints. In the case of three companies (Thames Water, Bristol Water and South East Water) equity injections amounting to 20%, 10% and 5% of initial notional equity were made in order to resolve financial constraints. In these cases, there was an allowance for the transactions costs relevant to issuing this amount of equity.

• While no further financeability issues were identified in the modelling, Ofwat had previously set out in its financial framework a policy view which indicated that, in the event of any adjustments being required, these would be dealt with in a manner that was NPV (net present value) neutral.

Financeability across industries

The financeability debate has been addressed in a number of industries, although there have, to date, been relatively few situations in which significant interventions have been required. Some exceptions include adjustments made to reopen price controls in the event of major
disruptions or changes in circumstance. For example, the UK’s National Air Traffic Services received a regulatory asset base adjustment and had depreciation allowances brought forward as part of a response to the shock to air traffic volume due to 9/11.

Most regulators now carry out a similar exercise involving modelling the financial profile of firms and checking that the proposed price limits will be consistent with reasonable financial indicators. In the energy sector, Ofgem’s application of this approach has not led to significant adjustments being required, although in part this may reflect that cash returns on new investment had been accelerated relative to underlying asset lives, mitigating the impact of such investment on financial profiles.

**The regulatory challenge: how to test financeability**

Looking at financeability challenges for the regulator, there are essentially two key questions which need to be considered in relation to the financeability duty: first, how should it be tested for; and second, what mechanism should the regulator adopt to mitigate or manage financeability problems?

In relation to testing, the standard approach, as noted above, is to assess financial ratios and compare these to thresholds consistent with maintaining investment grade (or above) credit ratings. There has been a debate about the dangers of regulatory ‘capture’ by the ratings agencies. However, regulators must surely adopt methodologies or assumptions which are consistent with the credit indicators most valued by the market as these determine the ability to raise finance in the real world.

Interestingly, the latest round of water reviews did not identify any firms for which an adjustment of prices is required. However, this is not entirely surprising given the following:

- The assumed starting balance sheet, with gearing of 57.5%, is relatively conservative;
- Higher levels of retentions have been assumed in the modelling;
- Ofgwat is somewhat more flexible in terms of how it interprets breaches of the ratios. Depending on their number and magnitude, breaches do not necessarily trigger a ‘failure’ in the test; and
- A seemingly flexible amount of equity injections can be assumed to address any remaining challenges.

As noted, three companies which faced the highest growth in their regulatory capital value (RCV) were assumed to make equity injections to offset the deterioration in financial position that this would otherwise cause.

One interpretation is that testing for financeability is a technical exercise, but which serves little purpose. After all, if portions of the type described above can be adopted, why not simply reject the basis of financeability as being irrelevant so long as companies can earn returns equal to the cost of capital?

On the other hand, the equity injections assumed did have a real impact, in that the associated costs of equity issuance were built into the allowed revenues (although these would be clawed back if the equity issue does not proceed). Furthermore, in different circumstances, the test might show that the required equity injection is very significant, which could lead to costs both in terms of market reaction and direct issuance costs. In such cases, alternative measures (i.e. ‘real’ changes rather than ‘modelled’ changes) to address the financing gap may be preferred.

**The regulatory challenge: managing financeability problems**

On the question of how to address a financeability concern should it arise, there are two issues to consider.

The first relates to how the overall regulatory framework might be designed to enable companies to mitigate financing risks, while protecting the interests of consumers. By creating an appropriate balance of risk between customers and companies, while signalling commitment to the RCV through consistent and transparent decision-making, regulators can set conditions which enable creditors and equity investors alike to invest in the sector. In principle, mitigating risk exposure would seem appropriate where companies do not have the ability to manage risk through prudent management.

Many companies argued during PR09 that the balance should move toward greater risk sharing with customers. This occurs already through mechanisms such as interim determinations in relation to notified items or relevant changes in circumstance which allow a price control to be revisited. However, there remains some uncertainty regarding how such re-openers will operate in practice. Sutton and East Surrey, which requested a price limit change in 2008 to reflect the substantial effects of increased power purchase costs and lost revenue from reduced consumption by metered customers, saw its appeal fail in front of both Ofgwat and the Competition Commission (CC), a UK independent public body which conducts inquiries into mergers, markets and the regulation of the major regulated industries. While all parties agreed that the materiality threshold had been met, and the CC agreed that the effects could not have been avoided through prudent management, both Ofgwat and the CC determined that the overall financial position of the company was robust enough to be able to carry out the financing of its functions. This clearly indicates that, while the sector has a wide range of risk-sharing tools at its disposal, the operation of some of these remains largely at the discretion of the regulatory authorities.

Secondly, options for providing increased financial headroom to address situations where the credit rating might otherwise be threatened must be assessed. Regulators facing such situations have approached this issue differently, in some cases providing revenue uplifts, in others changing the profile of cash through depreciation allowances. The latter approach is currently in favour given it is NPV neutral, but there remains a risk that this may generate further problems down the line (when depreciation allowances will inevitably be reduced). This highlights the importance of taking a longer term view, including for example a greater commitment and increased transparency over several price control periods.

**Financeability for the future**

A number of factors suggest that the issue of financeability will continue to play an important role in the water sector. The emergence of competition raises important questions about how the RCV will be allocated across business units, and what extent of separation of business activities will be required over time. Not only might this have repercussions in relation to debt covenants measured against RCV, but questions may be raised about what thresholds should be relevant for financeability testing for the wholesale side of the business and how the increased risk of stranded assets may impact on the cost of capital for the sector. In such a situation, options for increased financial headroom, risk transfer, or cashflow adjustments may be required to ensure that a stable financial structure for the sector can be preserved.

**About the authors:**

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Oracle announces enhancements to workforce management software

Oracle Utilities has released its Oracle Utilities Mobile Workforce Management 2.0 software, with new enhancements in scheduling, dispatch and field communication.

The new functionality includes improved fieldwork planning and scheduling. A computational grid feeds up to a year’s worth of planned maintenance and inspection field activities into the system to assign the right crew at the right time. In the field, the application helps shorten routes and reduce truck rolls. In the office, multiple departments can share the same view, breaking down work silos and helping to share field resources.

Automation of routine assignments and full-context decision support for dispatchers is also included. The application creates schedules based on complete data sets about each technician’s qualifications, experience, availability and work history, as well as utility work rules and key performance objectives. This enhancement optimizes assignments by allocating the best qualified, most cost-effective crew to the task, while improving customer service. When situations require human judgment, the application passes the decision to a dispatcher with full context. This new ‘context-oriented dispatching’ helps each field task address a utility’s strategic business objectives, while also decreasing the dispatcher-to-field worker ratio.

The software, says the company, also lets dispatchers and supervisors use a single interface to communicate with field workers, regardless of the device in use. Utilities can upgrade all devices at one time and the ability to communicate via SMS/text messaging lets utilities use common, low-cost, low-maintenance devices like mobile phones. *www.oracle.com/goto/utilities*

**PPIE unveils comprehensive platform for long-term pipeline monitoring**

The Pressure Pipe Inspection Company Ltd. (PPIE) has introduced a new long-term monitoring solution platform for critical water supply lines.

The solution platform combines PipeDiver technology, PulseFO fibre optics, and strategic monitoring devices to create customized solutions. This approach provides higher quality data to the pipeline operator and accelerates decision-making through near real-time information about pipe condition.

‘Until now, pipeline operators have typically had to rely on a single technology for their long-term monitoring programme,’ said Dr Brian Mergelas, President and CEO, PPIE. ‘This resulted in a higher total cost of ownership and often did not provide all of the required data to optimize their programme. The new PPIC platform emphasizes the right technology mix to reduce the most risk per dollar invested.’ A significant advantage of the PPIE long-term monitoring solution, says the company, is that once installed, the PipeDiver and PulseFO technologies are complementary and can both operate in the pipeline at the same time without need for dewatering or service shutdown. PPIE recommends using PipeDiver initially to obtain a baseline condition-assessment scan of the pipeline. Once the condition of the asset has been established, the right mix of services can be recommended including fibre optics, strategic acoustic monitoring or simply a repeat inspection programme. *www.ppic.com*

**InfoWorks TS unveiled for hydraulic transient analysis of water distribution systems**

MWH Soft has announced the fourth quarter release of InfoWorks TS. Anticipating and controlling transient response is critical to ensuring the effective operation of water distribution systems. Transient responses can introduce pressures of sufficient magnitude (upsurge) to burst pipes and damage equipment. The resulting repercussions can include extended service outages and loss of property and life. Transient responses can also produce sub-atmospheric pressures (downsurge) that can force contaminated groundwater into the distribution system. The InfoWorks TS transient flow analysis solution, says the company, will address pressure surge analysis and its role in utility infrastructure management and protection. It will provide the framework needed to assess the effects of pump station power failures, pump startup, valve closures, rapid demand and pump speed changes, and the efficacy of any combination of surge protection devices. The programme will also simulate transient cavitation and water column separation, evaluate their intensity, and estimate their potential effects on the system. *www.mwhsoft.com*

**Avalanche rescue technology used for hidden valve location**

Using avalanche rescue technology, the UK’s Sutton and East Surrey Water has been running a successful pilot testing a RECCO rapid location system, used worldwide by 600 rescue organisations, in order to find rural, overgrown water meters or main fittings. The system works by giving an audible response to a detecting radar signal ‘bounced back’ from a reflector placed in the underground location. At key sites and in the more rural areas, I think this technology could prove very useful,’ said Jeremy Heath, Development Engineer at the utility. ‘The other benefits are that there is no battery to run down in the reflector, the equipment is very easy to use, and training takes only a few minutes.’ *www.waterplc.com*

**MWH creates 3D site images to aid engineering design**

Using the Spheron 360 degree panoramic scanner camera with its software, MWH are able to create a ‘virtual’ site visit. This means, says the company, that the need for visits for different design and engineering groups is significantly reduced as is the need for repeat trips. Additionally any type of document can be linked to any pixel in any part of the site allowing it to serve as a ‘one-stop-shop’ for all project information. Mark Wynne, 3D Business Unit Director of the global environmental engineering consultants, explains: ‘This new 3D approach is making a huge difference and not just in terms of better time management and reduced costs. It facilitates more effective collaboration into the project workflow between the various disciplines because every discipline can see the data from other disciplines in the one location as they ‘walk’ through the virtual site.’ *www.mwhglobal.com*

**New Exor Dashboard technology for aids decision-making**

UK utility Bristol Water has partnered with Bentley System’s Exor Software team to develop the Utility ‘Executive Dashboard’ reporting tool — a reporting pack under the Information Manager product, to better meet the needs of utility companies. The dashboard, which currently provides tools with aggregated high-level executive information, is being extended to enable utilities to better manage their day to day noticing and street works as well as being able to report back monthly performance to the National Joint Utilities Group (NJUG) on core areas of competency and interest. *www.exorcorp.com*
Benchmarking is essential for those developing and implementing water policy. If decision-makers do not know where they have been or where they are, it would seem to be impossible to set reasonable targets for future performance. Information on water/sewerage system operations, investments, and outputs is essential for good management and oversight. This book is designed to help decision makers identify the data required for performance comparisons over time and across water utilities, to understand the strengths and limitations of alternative benchmarking methodologies, and to perform (or commission) benchmark studies.

This book provides an overview of the strengths and limitations of different methodologies for making performance comparisons over time and across water utilities (metric benchmarking). In addition, it identifies ways to determine the robustness of performance rankings. Current benchmarking activities in Latin America, Asia, Africa, Central Europe / Asia, and Organisation for Economic Co-operation and Development nations are summarized.

Five basic approaches to benchmarking characterize current studies:

- Core indicators and a summary or overall performance Indicator (partial metric method),
- Performance scores based on production or cost estimates (‘total’ methods),
- Performance relative to a model company (engineering approach),
- Process benchmarking, and
- Customer survey benchmarking.

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KIW Water Symposium 2009 - Financing Sanitation
‘Improving Hygiene awareness and sanitation’, Frankfurt, 8-9 October 2009

Author: KfW Development Bank

The central objective of the International Year of Sanitation was to put the global community on track to achieve the Millennium Development Goals MDG sanitation target. However, one year later, it is still difficult to keep sanitation high on the agenda, while practical action is required to encourage demand driven and sustainable solutions.

With the support of the German Ministry for Development and Cooperation and together with the European Investment Bank EIB and the French Development Agency AFD, KfW organised a two day Symposium to specifically address ways in which financing institutions can better promote the achievement of the MDG sanitation target.

More than 70 experts from various backgrounds explored the challenges of sanitation and discussed ways to further develop innovative financing mechanisms for improved hygiene, sanitation and wastewater management in low-income countries.

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For the full proceedings and the main findings and recommendations, please visit www.iwaplinline.com to download free of charge.

Energy Efficiency in Value Engineering: Barriers and Pathways
WERF Report WSS06R07a
Author(s): Joseph Cantwell

Value engineering is a technique that wastewater treatment facilities (WWTFs) currently use, when required, to analyze cost reduction and performance optimization opportunities. This report explores the potential to address energy efficiency during value engineering analyses of WWTFs. A survey of WWTFs identifies four WWTFs that conduct value engineering analyses, which are reviewed to determine their effectiveness in addressing process energy efficiency opportunities. The research presents barriers to conducting value engineering analyses and discusses possible mitigation pathways, such as steps the State Revolving Fund can take, development of a national value engineering standard, and development of WWTF-oriented energy efficiency training materials to add to SAVE’s value engineer certification training.

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Innovative Financing Mechanisms for the Water Sector
Author: Organisation for Economic Co-operation and Development (OECD)

This report examines innovative mechanisms that can help attract new financial resources into water and sanitation services. In particular, it focuses on mobilising market-based repayable financing (such as loans, bonds and equity) as a way of bridging the financial gap to meet the water-related Millennium Development Goals and other crucial sector objectives. The Camdessus and Gurria reports, published seven and four years ago, respectively, formulated a number of recommendations in this area. This report examines the extent to which these recommendations have been implemented. It looks at the rapidly evolving global context and to the ongoing financial and economic crisis, and considers how innovation in financing for the water sector may need to adapt.

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