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ANALYSIS

FEATURES

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IADB approves water and sanitation loan for Buenos Aires

The Inter-American Development Bank (IADB) has approved a $200 million loan to expand potable water and sanitation services in the Buenos Aires metropolitan area and suburbs.

The project is part of a wider programme that aims to add 1.5 million users to the water service and 1.4 million to the sewer system between now and 2011.

This is the first loan within a $720 million conditional credit line for investment projects approved by the IADB.

The expansion of potable water and sanitation services includes the construction of a collector sewer and pumping stations in the municipality of Tigre, which will enable the system to serve an extra 220,000 residents, and the construction of sewage networks in the municipalities of Tres de Febrero, Hurlingham and Ituazingó, which will serve 108,000 residents.

The project also includes a plan to reduce unaccounted-for water in order to reduce losses and make the best use of the distribution system, saving nearly 100,000m^3/day of water, and improvements to the San Martín potable water plant, which supplies 4.8 million people. Utility Agua y Saneamientos Argentinos will carry out the work. ●

Regulator calls for more maintenance

The Environment Agency (EA), which regulates the water companies in England and Wales, has responded to five year draft business plans by warning the companies that they must invest more in maintenance to improve the environment and cut the risk of pollution incidents.

Last year, water companies caused 20% of all serious pollution incidents, most of which were related to poorly maintained, overloaded or ageing sewerage infrastructure.

The EA called on the industry to 'be clear' about its capital maintenance priorities, taking into account potential environmental impacts. Its response welcomed many of the water companies' proposals, but urged them to do more to manage their resources and work with customers to reduce demand, which could include introducing compulsory water metering in areas of high water usage.

The environmental regulator will also ensure that water companies plan for secure supplies for people and industry, and adapt to population growth and climate change, it added.

The water companies will also be pressed to review their draft plans to take account of the increased risk of flooding to key assets due to climate change. Such infrastructure is often located by rivers and is particularly susceptible to flooding.

The Environment Agency voiced concern that few companies are proposing action on the issue of flooding from surface water drains – an issue highlighted by the Pitt Review of last summer's flooding as a key cause of the floods.

Although it recognises that companies have made a start on tackling the issue, the Environment Agency wants to see more commitment from companies to help with production and delivery of plans to help reduce surface water flooding. It is also calling on water companies to include firm proposals to reduce the number of properties at risk from sewage flooding. ●

World Bank green light for water and wastewater credit

The World Bank has approved a $20 million credit providing extra finance for its Armenia municipal water and wastewater project.

The additional funding will support the Armenian government's efforts to scale up activities under the ongoing water system rehabilitation and improvements programme. This includes an extension to the ongoing management contract between the Armenia Water and Wastewater Company (AWSC), the water utility in charge of the project, and an international water supply utility operator.

Armenia has made considerable progress in delivering safe and continuous water supplies, the Bank notes. Reforms in water management supported under the Bank-funded municipal development, municipal water and wastewater, and Yerevan water and wastewater projects have improved supply, quality and the water utilities' financial viability.

The need for further funding from the Bank to scale up the ongoing project was anticipated at project appraisal stage, and the management contract was prepared on the basis of a six-year programme. The extra financing will fund extension of the management contract and further, identified investments. It will also contribute towards meeting the Armenian water supply sector's massive investment needs.

Jonathan Kamkwalala, the leader of the World Bank team designing the project said: 'Citizens across Armenia have long awaited improvements in their water supply. The investment programme under the ongoing project has largely proceeded on track, and the repair and rehabilitation programme for AWSC water supply systems has already resulted in improved water quality and increased availability of clean and safe water supply in areas participating in the project.' ●

water utility management INTERNATIONAL

EDITORIAL

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Water Utility Management International focuses on the interests of utility executives, policy makers and advisors around the world engaged with the key management issues faced by water and wastewater utilities. As well as senior utility managers, the publication will be of interest to regulators, consultants, contractors, academics, and financial, technical and legal professionals.

Utility reform and achieving efficiency are central themes of the publication, encompassing topics such as benchmarking, investment planning, consolidation, public / private sector roles, leadership, IT, and human resources. Other regular themes include financing, regulation, charging policies, procurement, corporate governance and customer issues.

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Industry reports highlight experts' concerns

Two new research initiatives have produced a profile of water industry experts' concerns that suggest leakage and source water supply protection are at the forefront of the industry's collective consciousness at the moment.

Research commissioned by newly-launched water loss management company Miya reveals that a majority of the industry experts polled believe that water loss 'is a disaster waiting to happen'.

The research was undertaken this August among IWA members in both the developed and developing world, by independent research firm Circle Research. The respondents came from water utilities, consultancy, university, research institute and corporate backgrounds.

The Miya report found that the key issue when considering urban water losses was reported to be the provision of safe, clean water for the world's urban population (53% of respondents) followed by saving money (20% of respondents). Economic issues also featured in the American Water Works Association (AWWA) findings.

Conservative estimates suggest that around the world average losses are in the order of 33% of potable water put into supply – equivalent to 32 billion cubic metres, and worth around $18 billion.

The survey found around a third of respondents were unaware of the scale of the problem and nearly all (93%) found it unacceptable. A further 67% agreed with the statement that 'if water loss is not resolved in the next 15 years, we are likely to face crisis'.

Booky Oren, President and CEO of Miya, said: 'That the industry believes that the extent of water loss is unacceptable is no real surprise to us. That financing and lack of comprehensive coordination are perceived as major barriers to implementing effective water loss solutions is no real surprise to us. Miya was conceived to meet a very real and growing need. We believe that by offering municipalities best know-how and expertise as well as an unparalleled range of services, including effective financial solutions, we will enable many cities to address the growing problems with their water systems.

'What was surprising to us was the industry's concern over lack of awareness. We as an industry have a collective responsibility to sound the alarm and to address the fundamental threat water loss poses to safe, clean, affordable drinking water in cities.'

The industry believes it has 'an environmental obligation' to address water loss, the report found. Two thirds of respondents felt that the water industry will be held accountable for water loss and will be expected to compensate for it within the next ten years.

The Miya report contrasts in some respects with the new AWWA 'State of the industry' report, which places source water supply and protection as the top area of concern among North American water professionals.

For the first time, source water supply and protection was the most frequently mentioned area of concern for both the short and long term.

Other top issues identified in the AWWA report include the continent's ageing infrastructure, which was described as 'crumbling' and 'failing' by respondents. This concern, which equates directly to leakage, was the subject of disquiet that other pressing expenditure meant utilities were deferring infrastructure maintenance and therefore risking higher future bills.

AWWA Executive Director Gary Zimmerman noted of his association's contribution to the issues debate: 'The State of the industry report provides direct insights into how water professionals feel about issues today and in the future. Our analysis of this data guides the association's programming decisions to help address the greatest concerns of our membership.' ●

Loans and tenders

NEW ZEALAND: Government agrees small town wastewater system subsidy
The New Zealand government has agreed NZ$40 million ($24.7 million) in subsidies to help small towns improve their wastewater systems. A number of projects have already had final approval while others have provisional or preliminary approval. The government has said it is still looking at whether to bring forward other currently un-funded schemes for possible subsidies.

VIETNAM: ADB and Japan provide grant for public services and irrigation
Japan and the ADB, through the Japan Special Fund are providing Vietnam with a $1 million grant to help design a project to upgrade the quality of its water-related public services and improve the management of its irrigation resources. Vietnam itself will contribute staff, facilities and services equivalent to $250,000. The country is facing growing demands on its water resources due to a rapidly-growing population and economy. The agricultural sector, particularly crop irrigation, uses the majority of its water resources.

THE PHILIPPINES: ADB helps with urban water and sanitation project
The ADB is helping prepare a project that will improve water supply and sanitation services for urban areas outside Metro Manila, the main urban centre in the Philippines. The Multi-Donor Trust Fund under the Water Financing Partnership Facility (WFPF) will provide a $1.2 million grant to fund project preparation, while the Philippines will allocate $300,000 to complete the funding requirement. The governments of Australia, Austria and Norway contribute to the Multi-Donor Trust Fund.

BOSNIA AND HERZEGOVINA: EIB provides funds
The European Investment Bank (EIB) is lending €60 million ($86.9 million) for implementation of water and sanitation projects for municipalities and cantons in Bosnia and Herzegovina. The loan, which will cover up to 50% of total costs, will help to improve the quality of life of the country's citizens and meet Bosnia and Herzegovina's needs to comply in future with EU environmental legislation. The EIB loan will finance an investment programme for the water and wastewater sector in 15 towns to improve and expand water supply and sewerage systems and construct wastewater treatment plants. The EIB has said it would be prepared to consider a similar operation for Republika Srpska, the other entity within Bosnia and Herzegovina.

Business

UK: Hyder jv wins Severn Trent capital investment contract
A joint venture between Hyder Consulting and Faber Maunsell, AECOM, has been appointed by Severn Trent Water to advise on its five-year £2.9 billion ($3.4 billion) capital investment programme starting in 2010. Faber Maunsell and Hyder project teams will work as an integral part of Severn Trent Water's Asset Delivery Group to undertake feasibility studies and develop design solutions for key projects including water supply, sewerage and treatment plants.

US: SKM team win desalination evaluation contract in Florida
SKM has announced it is part of a team chosen to undertake an evaluation of alternatives and prepare preliminary design documents for a desalination facility on the north-eastern coast of Florida. The Coquina Coast Alternative Water Supply Project Seawater Desalination Committee has asked SKM and partners Malcolm Pirnie and Veolia Water to evaluate a land or ship-based facility, site selection, permitting, preliminary design and pilot testing. The work is part of an agreement between 11 cities in the area to develop a regional water supply plan.

UK: MWH partners on Thames embodied carbon project
MWH has partnered with Thames Water to undertake an 'embodied carbon accounting project' to enable the utility to plan its forward investment programme sustainably. Embodied carbon emissions result from construction and maintenance of the company's treatment and distribution infrastructure, rather than the day-to-day operational emissions. MWH and Thames have been involved in carbon accounting since the beginning of the company's work for UK Water Industry Research, which will set a common benchmark for carbon measurement for all water companies across the UK.

FRANCE: Veolia warns of water and waste downturn
Veolia Environnement has warned its water and waste management businesses have slowed down, and that it expects total investments to fall 34% to $5.4 billion this year. In a statement the company cited slowing economies and temporary incinerator closures as the reasons, and said it will present revised estimates for 2008 this week. The company's shares have fallen 63% so far this year.

MENA: Veolia teams up to focus on Middle East-North Africa work
Mubadala Development Company and Veolia Water have announced an intention to create a joint-venture company to focus on water production and wastewater collection and treatment in the Middle East and North Africa region. Veolia says the activity could later lead to further joint ventures for other business sectors within Veolia Environnement. The move follows a decision by Mubadala, Abu-Dhabi's state investment and business development company, and Veolia Water, to work together on municipal concessions and public-private partnerships in the region. Veolia will own 51% of the venture and Mubadala 49%.

US: Black & Veatch wins Toledo contract
Black & Veatch has announced it has been chosen to provide engineering services and programme and construction management services for Phase II of the Toledo Waterways Initiative. This phase is a part of a 15 year, $450 million initiative designed to control CSOs by upgrading aging sewer system and wastewater treatment facilities in the city of Toledo, Ohio. This final ten years of the waterways initiative includes design development and implementation of 25 projects, including separate sanitary and storm sewers, storage facilities and modification or installation of extra flow regulators in combined sewer areas.

Loans and tenders

KYRGYZ REPUBLIC: ADB provides extra finding for water and sanitation project
The Asian Development Bank (ADB) is granting an additional $30 million to a project that will provide cleaner drinking water and better sanitation for 1.5 million people in the provinces of Chui, Jalal-Abad, Osh, and Batken in the Kyrgyz Republic. The community-based infrastructure services sector project was initially approved in 2000, with ADB extending a $36 million loan. The additional Asian Development Fund grant will ensure completion of the project following sharp increases in the prices of various basic commodities such as steel and cement during project implementation.

SOUTH AMERICA/CARIBBEAN: IADB and Spain set up water and sanitation cooperation
The Inter-American Development Bank (IADB) and the Spanish government have agreed to cooperate in implementing the Fund for Cooperation for Water and Sanitation, a Spanish initiative that should provide around $1.5 billion in grants to Latin American and Caribbean countries over the next four years. Spain will assign priorities and evaluate the impact of Fund projects, and the IADB will identify and prepare specific investments and oversee their implementation and evaluation in liaison with the governments of the recipient countries.

WALES: EIB provides funds for water and wastewater upgrades
The European Investment Bank (EIB) is lending £100 million ($170 million) to Dwr Cymru Welsh Water for a series of water supply and wastewater treatment schemes across Wales. The EIB is supporting the second phase of Welsh Water's 2005-2010 investment programme, which will ensure continued compliance with EU and domestic standards. The EIB-funded projects, which will be undertaken by Welsh Water between 2008 and 2010, will improve living standards for Welsh citizens thanks to essential upgrades in water treatment and improved sewage and wastewater infrastructure. The project will mainly consist of rehabilitation or construction of numerous wastewater treatment schemes and a comprehensive water mains replacement programme across the country.

INDIA: Japan Special Find provides grant for pilot PPPs
The Japan Special Fund, through the ADB, is to provide a $2 million technical assistance grant to help government agencies in India develop a number of pilot PPP projects that will eventually act as models for future projects. Infrastructure sectors covered under this initiative include urban development, transport, water, health and education. Under the technical assistance, 'project development' involves all aspects of project structuring including institutional, financial, commercial, legal, social, environmental and technical structuring, leading to a competitive bid process to attract private sector participation.

CHINA: ADB provides funds for water resource allocation framework
The ADB is helping China to prepare a framework for managing the allocation of water resources to meet the needs of its growing population and rapidly-expanding economy. ADB will provide a $500,000 grant for the project from its technical assistance programme. The Multi-Donor Trust Fund of the Water Financing Partnership Facility, which is managed by ADB, will provide a $250,000 grant and China itself will allocate $200,000 to complete the funding.

INDIA: ADB approves urban water supply loan
ADB has approved a $71 million supplementary loan for an urban water supply project in India's Mahya Pradesh state. The project aims to improve the water supply services, sewerage and sanitation services, storm-water drainage, and solid waste management in the largest cities of Madhya Pradesh – Bhopal, Gwalior, Indore, and Jabalpur. The cities are trade, commerce, and tourism hubs, whose growth potentials are constrained by poor water and sewerage infrastructure systems. ADB and India signed a $181 million loan agreement in March 2005 to support the project. However, progress was hampered by slow awarding of contracts, which eventually led to a huge cost overrun due to the rupee appreciation and price increases since the project appraisal in 2003. Other cost increases mean the project cannot be completed as envisaged without more funding.

ADB and Japan fund water supply improvements

Japan and the ADB are providing $890,000 in funding for a secure and safe water supply to residents of the capital of Chuuk, one of four Federated States of Micronesia.

The grant will support water demand forecasts for Weno island until 2020, identification of potential water sources to meet long-term demand and a tariff study and survey to gauge the willingness of residents to pay for an efficient water service.

The project will also increase the supply of water from groundwater sources; improve water quality through chlorination, reducing the incidence of waterborne diseases; train personnel in maintaining water supply wells; and boost community awareness of the need to conserve water and protect watersheds.

Through the water conservation element of the project, the average per capita demand for piped water is expected to decline from a current 400 litres daily to less than 200 litres two years from now. Water production should also rise from 3.6 million litres daily to about 5.8 million by 2010. This will fulfill about 85% of average daily demand. ●

US EPA loan for Virginia water quality management

The US EPA has announced that it is providing $13.9 million to Virginia to improve water quality.

The grant, along with $2.8 million in state matching funds, has been awarded to the Virginia Department of Environmental Quality to provide further capital for its revolving loan fund, which provides low interest loans for the construction of wastewater treatment facilities, non-point source and estuary projects, as well as other water quality management work.

Donald S Welsh, regional administrator for EPA's mid-Atlantic region, said: 'EPA is committed to helping communities get safe, clean water. These grants are important to maintaining public health, protecting and restoring healthy water quality, and combating pollution.'

In Virginia, more than $230 million will be targeted at projects to provide enhanced treatment of wastewater to remove nutrients, ultimately benefiting the health of the Chesapeake Bay. Other projects to be funded will address sewer problems in local areas. ●

ADB provides funding for Cambodia water and sanitation project

The ADB is laying the groundwork for a water and sanitation project that will help improve the health and lives of about 200,000 people living in nine towns in Cambodia, the Lao People's Democratic Republic, and Vietnam.

The towns are situated in economic corridors that have roads linking the six countries of the Greater Mekong Subregion (GMS). A key ADB strategy is to develop the corridors in order to strengthen cross-border ties, expand sustainable economic opportunities, and reduce poverty.

Paul van Klaveren, a Water Supply and Sanitation Specialist with ADB's Southeast Asia Department, said: 'The economic growth of secondary towns in the corridors will lead to higher incomes and improved quality of life for their people.'

A $1.5 million technical assistance is being extended to pave the way for the Mekong water supply and sanitation project. Funding will come from various sources including ADB's Japan Special Fund ($400,000), the Dutch government (a $300,000 grant via the Water Financing Partnership Facility), and the governments concerned. ●

EBRD supports water and wastewater projects in Siberia

The European Bank for Reconstruction and Development (EBRD) is supporting rehabilitation and upgrading of municipal district heating, water and wastewater services in the Siberian city of Pyt'Yakh with a 350 million rouble (equivalent to approximately €10 million) loan. A more efficient and effective use of resources will be central to the efforts.

The EBRD-financed programme will include a significant district heating focus, with water supply and wastewater collection facilities also being upgraded.

The municipal services management company that will be given the EBRD loan will implement the programme. The company is introducing a gradual tariff reform based on affordability, which will help set up sustainable business model.

Pyt'Yakh has around 40,000 inhabitants and is in the Khanty-Mansi Autonomous Okrug (region) in western Siberia. The city is about 200km west of one of the main cities of the region, Surgut, and was established in the 1960s following the discovery of western Siberia's second largest oil field.

The new EBRD loan is part of the Khanty-Mansi regional municipal services development programme, under which the bank has already provided two loans to Surgut for municipal services and housing refurbishment. Because of the success of the programme, other municipalities in the region are considering similar projects. ●

Water supply and sanitation loan for Belarus

The World Bank has approved a $60 million loan to the Republic of Belarus for a water supply and sanitation project. This aims to increase the efficiency, quality and sustainability of water supply and sanitation services to 1.7 million people living in 20 rayons (administrative sub-divisions) across the country. This is the first operation under the recently-approved World Bank's country assistance strategy for Belarus (2008 to 2011) which is targeted at areas that improve people's livelihoods and contribute to protecting the environment.

The project has three components. The first, with an allocation of $53.6 million, will finance water supply development through rehabilitation and construction of deep wells, pumping stations, transmission mains, distribution network, ground and elevated reservoirs and iron removal plants.

This component will also finance rehabilitation of the wastewater collection system and wastewater treatment plants including the installation of pumping stations, sludge dewatering systems, collection networks, monitoring stations and small laboratories.

The second component, worth $6.05 million, will finance engineering and construction management activities needed in order to undertake the investments in component one. These include engineering preparation, preparation of feasibility studies and designs as well as bidding documents. It will also include advisory services and construction supervision, as well as monitoring and evaluation and reporting on audits.

The third component, worth $0.2 million, will ensure project monitoring as well as training to enhance technical capacity and competence of the participating utilities. The project will be implemented by a project coordinating team within the Republican Unitary Enterprise Zilkommuntekhnika reporting to the Ministry of Housing and Utilities. ●

Energy management requirements regulation under discussion

A project committee has met for the first time regarding the formation of ISO 50001, a management system standard being put together to facilitate efficient energy use and performance. **LIS STEDMAN** reviews the aims of ISO 50001 and the progress being made.

PC 242, the new project committee for the critical global International Organization for Standardization (ISO) energy management standard, met for the first time this September.

ISO estimates that the standard could influence up to 60% of the world's energy use. The future ISO 50001 will establish a framework for 'industrial plants, commercial facilities or entire organisations' to manage energy, and targets broad applicability across national economic sectors – so will undoubtedly be a key standard for the water industry around the globe.

Attending the meeting were delegates from 25 national member bodies across all of the regions of the world, as well as representatives from UNIDO, the UN Industrial Development Organisation, which is liaising with PC 242.

All of the participating countries have existing energy management activities and have a strong interest in developing a harmonised solution at an international level.

Part of the proceedings at the Washington DC meeting involved delegates describing in detail these initiatives. UNIDO, for example, gave a presentation on the preparatory work that it has undertaken to support the ISP (Institution-based Strategic Project) process by researching energy needs in developing countries.

This feedback session gave the project committee an insight into the various policies and situations around the world, which will have to be taken into account when developing the global ISO standard.

Swift progress has already been made – the report from the first meeting says 'excellent progress' was made in the technical discussions and a first draft has already been created.

One major discussion point is the need to ensure compatibility with the existing ISO management system standards. For this reason the committee decided to take a critical decision to base the draft on the common elements found in all of ISO's management system standards. This will ensure maximum compatibility with other key standards such as ISO 9001, quality management, and ISO 14001, environmental management.

The ambitious schedule, which PC 242 is committed to keeping, aims to have ISO 50001 ready for publication by the end of 2010.

ISO Secretary-General Alan Bryden is quoted as saying: 'This first meeting of PC 242 marks the launch of a new global approach to systematically address energy performance in organisations, pragmatically addressing energy efficiency and related climate change impacts. It is fully in line with and supportive of the global mobilisation on these major challenges, and with the IEA (International Energy Agency)-ISO position paper on the contribution of international standards.'

The background to the ISO is that, based on the issues outlined above and a UNIDO Expert Group Meeting on industrial energy efficiency and energy management standards held in March 2007, a group of interested US parties came to ANSI (American National Standards Institute) in order to work together to draft a new work item proposal on the subject. ANSI and ABNT (Associacao Brasilieira de Normas Técnicas, the Brazilian standards agency) partnered on the proposal, explains Jason Knopes, who works for ANSI and is the secretary to PC 242, and Ed Pinero, who is chairing the committee.

The proposal was unanimously approved and ISO assigned the committee secretariat to the partnership of ANSI and ABNT and noted the interest of BSI (UK) and SAC (China) to be engaged in the PC leadership.

Although remarkable progress has been made on the standard, no energy-specific requirements were defined at the meeting. Several requirements, as well as the importance of metrics, data, and continual improvement as key elements of energy management were discussed.

Mr Pinero says: 'The progress was excellent, we had 75 individuals from 20 countries at our first meeting who agreed on a framework that we used as a starting point. Meeting participants then broke into groups in order to add text to the agreed-upon sections. The text was organised into one document which has now been circulated to all appointed ISO/PC 242 working group experts for comment.'

In terms of whether this ISO ties in with some of the other current work of the BSI, such as specifications on greenhouse gas emissions from goods and services, Mr Knopes notes: 'Robust energy management is a cost effective way to help with GHG (greenhouse gas) reductions and the ability to measure progress. Although these elements are not directly tied, there is synergy among the efforts.'

BSI is the ISO member body for the UK and is facilitating the participation of the UK 'mirror committee' for ISO/PC 242. BSI is also supporting the Secretary role of the ISO/PC 242 working group, which is responsible for the initial drafts of the future ISO 50001.

The significance of this project in terms of energy usage and effect (both economic and environmental) on the sectors targeted will be considerable. Mr Pinero notes: 'The whole purpose of this standard is to help improve energy efficiency and energy performance through an emphasis on managing energy for continuous improvement. Based on broad applicability across national economic sectors, the standard could influence up to 60% of the world's energy demand.

'Corporations, supply chain partnerships, utilities, energy service companies, and others are expected to use ISO 50001 as a tool to reduce energy intensity and carbon emissions in their own facilities, as well as those belonging to their customers or suppliers, and to benchmark their achievements. It will be up to the countries, sectors, and organisations themselves to provide specific targets, but we do expect to lead to enhanced energy performance through the use of the standard.'

The IEA-ISO position paper on international standards to develop and promote energy efficiency and renewable energy sources points out that energy-efficient technologies are being held back by a range of barriers such as a lack of awareness and information, and divided incentives. But this ISO will facilitate rather than recommend. Mr Knopes explains: 'ISO 50001 won't promote specific energy-efficient technologies. It will state requirements for an energy management system, not how it should be done, but we expect that robust energy management will lead to better energy performance. Through a commitment from top management, ISO 50001 seeks to create a culture of greater awareness and receptivity to energy efficient operations and technology.' ●

Current challenges in performance assessment of water services

Performance Indicators can be used to improve a utility's efficiency through self assessment. **HELENA ALEGRE, ENRIQUE CABRERA JR.** and **WOLF MERKEL** discuss the results of COST Action C18, a project on performance assessment of urban infrastructure services.

Performance assessment has been one of the hottest topics in the water industry for the past decade. The use of performance indicators (PI) and benchmarking techniques has become a common practice during this period. There are many good reasons behind this success. Water services are provided in a monopolistic environment, and in the absence of market forces it is hard to find motivation for efficiency. All the stakeholders in the business have come to realize that by assessing the performance of the services in a systematic way, utilities are driven to continually improve their performance with the consequential benefits for all those involved.

As the use of PI is generalized and utilities and regulators rely more on these techniques for their decision making processes, they realize that the tools still need refining and that some work is still necessary to get the most out of these performance measures.

Five years ago, a project on performance assessment of urban infrastructure services was submitted to the European Union under the COST programme. The COST Action C18 spanned for four years, bringing together over 50 experts from 19 European countries to discuss the present and future of performance assessment. This article presents the results of those discussions.

The evolution of performance assessment

Since the 1990s, performance assessment has been playing an increasing role in the water industry. Since the establishment of the economic regulator of England and Wales, Ofwat, the number of initiatives using performance measures and comparison in the world has been increasing constantly.

To date, performance assessment usually starts with utilities or associations collecting statistical data. They recognise the importance of assessing the utilities' performance, but the objectives of these exercises are not always clear.

If the results are positive, regional or national metric benchmarking projects of some sort are undertaken, competitiveness appears and the comparisons become periodical. The best performers are often urged to go abroad and check their performance with some relevant international utilities.

Once utilities realize that someone is doing better in an area, they feel the need to understand the reasons behind that fact (so they can improve and reach at least a similar level). This leads to process benchmarking initiatives, which is the stage where many of the longest running initiatives are now.

In these 15 years of performance assessment of water services, some lessons have been learnt. The following list includes some of the most typical misunderstandings that should be avoided when running a PI project.

Lack of engagement of the organisation's CEO

Performance Indicator systems are useless if data are not reliable or if results achieved are not used to support improvement measures within the organisation. Unless there is tangible support from the top management of the organization, projects are doomed to fail.

Incorrect selection procedure

The procedure recommended by the International Water Association and in the ISO 24500 standards for the implementation of a PI system starts with the definition of objectives, followed by the establishment of assessment criteria and only then by the selection/definition of performance measures matching to these objectives and criteria. This is not usually the case, and the selection of indicators is in many cases inconsistent, unbalanced and not very useful.

Temptation of going from zero to a 'PI heaven'

When an organisation starts to select and implement performance indicators, there is typically the temptation that every aspect of the management should be covered. It is fundamental to assure that a balanced solution is found, and that the number of indicators is kept as small as possible, so the cost of data collection, validation, archiving and processing can be recovered.

Temptation to reinvent the wheel

Many organisations feel that they are unique and therefore will need to develop their own performance measures and establish their own systems.

This is partially positive and understandable. However, it is important to take benefit of the existing PI systems like the IWA proposal, which have been tested and refined over the years. The use of existing PI systems recognised as international references has the obvious added advantage of allowing comparisons with other organisations adopting the same platform.

Misuse of concepts

Using the right words and the right tools for each problem is important. A direct measure is not an indicator (length of pipes) and something that can be changed by a management decision is not part of the context. These basic notions, often forgotten, are well documented and easily available in the IWA manual and in the ISO 24500 standards.

Only best results welcome

Utility leaders are human individuals and tend to easily accept good results (even without sufficient proof), while failing to adequately react to low performance. A common response is to invest a lot of effort trying to justify poor results instead of concentrating on the analysis of potential problems and countermeasures to improve. A fault-positive culture in the utility is crucial for accepting bad performance results as a chance for improvement.

High short-term expectations

Measuring the company or the sector performance will not provide automatically improved performance. Improvement measures often need some time to make an impact on the performance figures. Benchmarking is by definition a continuous process and its effectiveness cannot be evaluated after one period. Nevertheless, there are many examples for immediate positive response on starting performance measurements, presumably due to the fact that introducing performance thinking in a company automatically drives decisions towards higher efficiency.

Current challenges in performance assessment

Despite all the experience gathered through these years (or perhaps due to the new possibilities discovered in that period) not everything is done in the measurement of

Relevant milestones in the application of performance indicators

- 1989 – OFWAT is established as the economic regulator of the water services in England and Wales. A system of performance indicators, including data quality assessment and auditing, is established.
- 1995 – The cities of Copenhagen, Oslo, Helsinki, Stockholm, Gothenburg and Malmo decide to start a comparison of their performance by using indicators. The project has evolved through the years into new forms of benchmarking.
- 1998 – The Water Services Association of Australia (WSAA) starts publishing WSAA Facts (currently National Performance Reports) including audited data from the major urban utilities in the country. WSAA starts running international process benchmarking efforts in 2004.
- 2001 – A large metric benchmarking project in relation to the IWA field-test establishes the concept of voluntary performance assessment in German water supply. A first major application of the IWA indicator system was a project in Bavaria (Germany) with almost 100 small and medium utilities.
- 2004 – Portuguese utilities begin reporting to the national regulator IRAR using a performance indicator system based in the IWA proposal. The assessment does not include mathematical modelling and indicators are not only focused on the user perception but include assessment of the operators and of the environmental sustainability.

performance. Problems have evolved and require new solutions. Below are some of the most relevant challenges presently faced by the water industry regarding the assessment of performance.

Taking into account the data quality in the decision making process

Performance measurement systems are always the means to some sort of decision making process. Unfortunately, those decisions are often made based on poor data. A performance indicator figure hardly ever shows how it was obtained or where it came from.

Even in the PI systems in which some sort of data quality information is included, it is difficult to take such information into the analysis stage of the results. In other words, it is difficult to determine whether a good indicator value based on poor data should be better than an indicator below target obtained from accurate data. How to incorporate data uncertainty into the decision-making process is still a challenge.

The road ahead – key research areas and future applications

Based on the experience achieved, members of COST C18 discussed which are the key research problems related to the management of urban water infrastructures, currently not covered by on-going projects of the European Framework Program. R&D topics recommended are:

- Efficient management of small community systems
- What makes a utility sustainable?
- Common framework for capital maintenance suitable to medium and small European communities
- Performance assessment and decision support systems for the urbansolid waste services

Finding the driving factors

When measuring performance, 'why' is as important as 'how much'. One of the key aspects of making performance assessment successful is to identify the driving factors behind a certain level of performance, and whether those factors can be corrected or not.

Synthesising the results

Whether they are to be presented to a board of directors, the press or the general public, performance assessment results often need to be simplified. However, both in metric benchmarking and in utilities' self assessment of performance, the big picture usually fails to deliver some of the most interesting details, and it can even lead to misunderstandings and wrong conclusions. Providing a reliable and transparent way of synthesizing the results of the assessment is a problem that still needs further development.

Applying the tool to small scale systems

A problem which is not limited to performance assessment is how to apply best practices in the management of services to small scale systems. In the case of performance indicators, the available data in these systems is often scarce or unreliable. The resources are also limited, increasing the difficulty of improving the situation. Finally, in such systems there are often impending problems of a greater importance. How can performance measurement systems become useful in such systems?

Quantitative statistical models vs. qualitative assessments

Regulators in the utilities' sector have been using performance indicators for decades. Many of them used approaches in which a complex mathematical model assesses comparative performance by establishing relationships between inputs and outputs or evaluating efficiency. Such methods have the advantage of being fair to all those involved (the assessment is the same for everyone) but the disadvantage that a deep knowledge of the equations driving the model is needed to avoid erroneous conclusions. Whenever this is not the case, the users do not trust and use the results, unless they 'look good in the picture'.

The alternative might not be any better. In other systems, the human factor is introduced to assess performance. Experts review the PI values and take into account context factors to assess in a qualitative manner the performance. Obviously, despite the process being totally transparent, such person can introduce bias in the method which is strongly influenced by the experience and knowledge of the expert.

The challenge remains in how to achieve the advantages of both methods without facing the disadvantages.

Conclusions

Judging from the growing number of initiatives worldwide, performance assessment has been accepted by the industry as a key tool to drive efficiency and best practices. The IWA has played a key role in this development by creating the system which is currently the worldwide reference, and by thoroughly disseminating such practices. The publication of the ISO 24500 standards will only contribute further in that direction.

Action COST C18 was created four years ago to try to take matters a little further and determine future challenges and research needs. From such activities, it is possible to say that although the water industry has already begun to actively use performance assessment tools, important work is still needed to refine the practices in those projects. This action demonstrated that principles for establishing and implementing PI systems developed for the water sector are sufficiently mature and universal to be adopted by other urban infrastructure services. The development of sector-focused PI systems, based on these generally accepted principles, is a remaining challenge.

An important part of that work has to do with the need for simplification of results. Analyzing the performance of a utility is a complex task, and all attempts to simplify the results lead to an incomplete picture that may even result in wrong decisions being made. Until better methods and/or data quality lead to more reliable results, a more complete picture of the assessment should always be available to gain a deeper understanding of the assessment.

In the coming years, the increasing number of national and regional regulators, as well as the search for best practices by the industry, will produce an increasing number of performance assessment and benchmarking projects, and also an increase in the maturity of such projects. It is quite likely that the need to produce better results from those studies will also drive the improvements still needed in the assessment methods. ●

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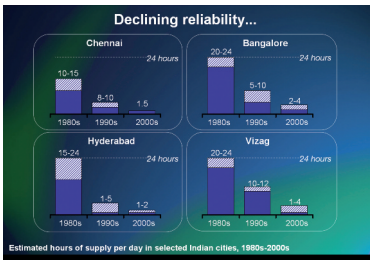
Improving water supply provision:
The Jamshedpur corporate private partnership water management system

Tata Steel subsidiary Jusco, which provides water services in the Indian city of Jamshedpur, has driven down water losses to enable it to serve new households outside its service area. **GS BASU, PRANAY SINHA, ARNAB GHOSH AND SIVARAM SISTLA** report.

Cities in developing nations across the world are growing at an unprecedented rate. Over the past three decades, the populations of such cities have more than trebled, resulting in an alarming increase in demand for potable water. The situation in Jamshedpur, as in the rest of India, is no different. Water systems in India are traditionally managed by ULBs (Urban Local Bodies), which are the third tier of governance. Over the years the ULBs have adopted a supply-driven approach with little demand-side management, which has resulted in high infrastructure costs and huge amounts of water wastage.

This approach has sucked the ULBs into the vicious 'low-service equilibrium' cycle of 'low tariff – poor financial performance – poor service – poor collection – further poor services'. Political interventions, aimed at protecting the interests of the lowest strata of society, produce unrealistically low tariffs that do not cover the cost of service, and often not even operation and maintenance costs. This leads to an inadequate quality of service and dissatisfaction amongst consumers, which brings about large-scale non-payment of bills. Non-recovery of costs forces further under-performance at the utility. Even the infrastructure is built with state government subsidies due to intense political pressure to not burden consumers with connection charges.



Most new urban agglomerations depend on groundwater, which is depleting rapidly and is of doubtful quality. Poor people rely on public hand pumps, community taps, tankers or stolen water connections obtained from the 'water Mafia' at exorbitant cost. These supplies are characterised by poor availability, doubtful quality, and a high incidence of waterborne diseases and fatalities.

Jamshedpur, Jharkhand – steel city

The Tata Steel lease area at Jamshedpur, serviced by the wholly-owned subsidiary Jusco, has over the years received a good quality potable water service for six to eight hours a day that meets all of the BIS (Bureau of Indian Standards)/WHO (World Health Organization) norms. While consumers here enjoyed a good service, the water supply system was characterised by high consumption patterns of more than 250LPCD (litres per capita per day) in 2005 compared to the national average of 135LPCD, high losses in the supply network of more than 40% and a fixed, flat tariff regime.

However, residents in the periphery (the unserved areas) of the lease area have not been so privileged. Growth over the years has resulted in the construction of nearly 40,000 households (a population of around 300,000) in these areas, which are not serviced as these areas do not fall into Jusco's service area and there is no ULB in Jamshedpur. These areas used to depend on groundwater for general use, and for potable purposes they used to steal water from the Jusco network or buy from unauthorised water vendors (who obtain water from Jusco's public hydrants). This meant there was significant unfulfilled latent demand for quality piped drinking water there.

Increasing pressure from the residents of these peripheral areas triggered a series of innovations at Jusco to provide a service without trapping the recipients in the 'low-service equilibrium' cycle.

The initiatives included reducing losses (non-revenue water) and consumption in the served areas, improving the customer management process, exploring alternative sources of funding for new infrastructure and implementing a volumetric tariff regime.

Reducing non-revenue water (NRW)

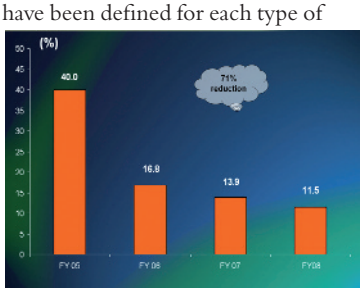
Losses in the municipal urban water sector are called non-revenue water (NRW), which is defined as the difference between the amount of water put into supply and billed volumes. Components of NRW include leakage, theft (illegal connections), public hydrants and meter inaccuracies. Jusco was able to reduce overall NRW from more than 40% in 2005 to 11.5% in 2008.

Sufficient water to serve the needs of the peripheral areas has been legitimately created through the NRW reduction programme in the lease areas. Reducing leaks and illegal connections has resulted in potable water savings of 23MLD from the 2005 financial year to the 2008 financial year. About 10,000 new connections (covering a population of around 70,000) have been provided to consumers in these peripheral areas who were previously dependent on groundwater.

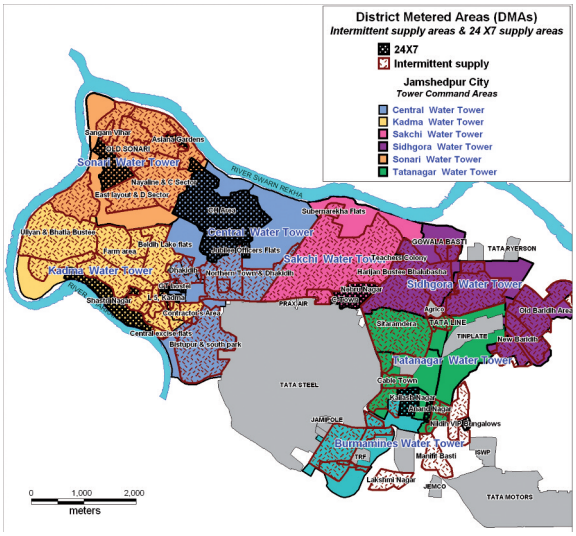
This initiative has reduced exploitation of groundwater by about 3.7 billion litres per year. Implementation of a Geographic Information System (GIS) for utility mapping, leak detection, customer complaint management and hydraulic modelling to establish optimum water networks have accelerated the efforts to reduce NRW.

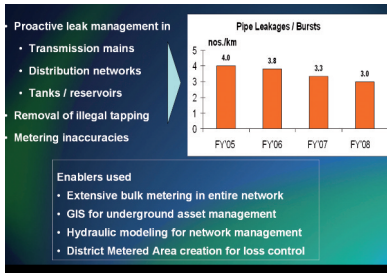
Improving the customer management processes

Jusco has initiated a 24-7 customer care solution known as Jusco Sahyog Kendra (JSK) to address day-to-day customer complaints. This is the first system of its kind at an Indian water utility. Service level guarantees (SLGs) have been defined for each type of

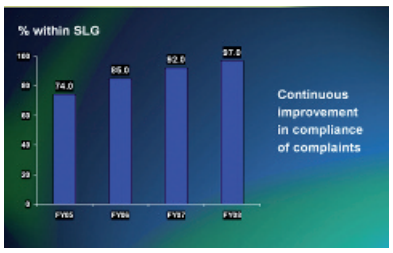


Reductions in Non-Revenue Water





Reduction of losses in served areas



Improving service delivery

complaint and compliance with these is over 90%.

Jusco's water service also has a state-of-the-art National Accreditation Board for Testing and Calibration Studies (NABL) (ISO 17025) accredited laboratory, the first such facility within an Indian water utility. This has generated improved customer confidence in the quality of the water, which is now available straight from the tap. These service and quality improvements have helped Jusco to initially enhance the flat regime tariff (from Rs75 ($1.59) to Rs120 ($2.54) per month) to meet operation and maintenance costs without significant customer protest.

Improving demand side management

A volumetric telescopic tariff regime (including a 'sustenance' tariff rate for the first 10,000 litres/month of consumption) has been implemented to drive lower consumption and conservation. This has also enabled cross-subsidisation between different consumer segments (commercial, institutional, domestic and industrial) and, within domestic segments, between different economic strata. Metering has been introduced at all major locations, which has improved consumption patterns through enhanced awareness of usage. Domestic consumer metering is ongoing but has not yet been completed.

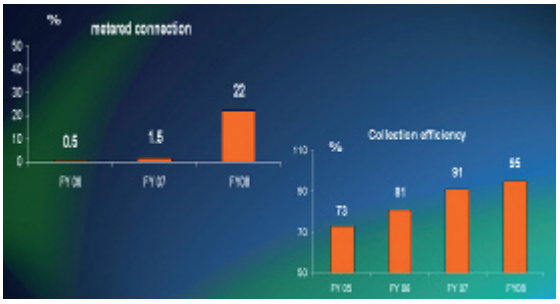
Corporate private partnership

The residents of the peripheral areas approached Jusco for a piped water service. Jusco neither had a mandate from government, nor the water network infrastructure to cater to the requests. An innovative model known as a corporate private partnership (CPP) was initiated, in which the corporate body collaborated with the public and they jointly addressed the water service-related requests.

This is a unique approach, the first time it has been attempted by any Indian utility, in which the community shared the water network development costs and permission to lay a water network was also organised by the community. Jusco made the initial investment in the water infrastructure, with the costs subsequently recovered from consumers (these were sometimes as high as Rs12,500 ($262) per connection). Provision for payment in installments was made for those who could not afford this cost. The residents have been educated in the advantages of the approach, which has led to positive recommendations that have warded off political pressures. Memorandum of Understanding (MOUs) have been signed with the representatives of these areas to enable the service to be provided by Jusco.

The initiative could well have failed, since nothing like this had ever been tried before and water is considered as a 'birthright' that should be provided free by the service provider. However, well thought through and bold interventions ensured the success of the initiative. Jusco proved successfully that water can be a profitable business provided a good quality service is ensured.

Volumetric tariff



Sl.No.	Customer Type	Consumption Block / Month	Proposed Rate (Rs /KL)
I	Domestic Consumers	Up to 10 KL	5.00
		11 to 25 KL	6.00
		26 to 50 KL	8.00
		Above 50 KL	10.00
IA	Domestic Bulk Consumers	Up to 25 KL x Nos of units	6.00
		Above 26 KL to 50 KL x No of units	8.00
		Above 50 KL x No of units	10.00

Creating opportunity

There was an overwhelming response to this initiative from management as well as the community. This innovation has enabled the creation of new avenues for business development within Jamshedpur as well as further afield. Several agencies including the World Bank and the Asian Development Bank (ADB) have recognised Jusco for this initiative.

Potential impacts of the initiative

The first is economic: the project could generate around Rs12 million ($250,301) in revenue per annum from approximately 10,000 connections. The projected connections in unserved areas are predicted to rise to 40,000 over the coming years.

The second is environmental: around 3.7 billion litres of groundwater have been conserved (10.1MLD), protecting the aquifers. The third impact is social – consumers are getting clean and safe drinking water at a marginal cost and with a reliable service. Government responsibility is also fulfilled at no cost to them.

Insights derived from the initiative

If customers get a reliable service at an affordable price, they are willing to pay the infrastructure and service costs. The CPP model can be a solution to the urban water service problems plaguing the country, and the results have also shown that a metered tariff regime drives water conservation. A sense of ownership is more prominent given this kind of business model, which helps to foster better management of the operation and maintenance of the infrastructure and water services. If microfinance can be organised for potential customers, the success rate can be improved. ●

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International statistics for water services: the information every water manager should know

Statistical information is critical to water utilities. **DR RENATO PARENA** looks at the latest work from the IWA Statistics and Economics Specialist Group.

Literature and practice emphasise the need for water prices to be based on both 'economic and environmental efficiency' and 'broad (social) equity' goals, and stress the desirability of consumption -based pricing that improves pricing signals in order to move towards sustainable use of a natural resource.

The growing world population have boosted the number of world cities with populations in excess of five million residents (so-called megacities). During the past 50 years the number has more than quadrupled, and in the next seven years it is expected to double again.

The challenges and opportunities associated with urban water shortages (normally given only minimal consideration by local governments) on the one hand, and increasing energy production and agricultural water demand on the other, make it necessary to rethink urban water management.

In addition, achieving the targets defined in 2000 by the UN Millennium and Johannesburg Summits will require enormous amounts of finance and fundamental reforms to water governance, in a context where involving private capital is the key opportunity for governments to alleviate the ever-increasing burden of public finance, particularly where developing countries are concerned.

Developing a strategy

Approaching the economic evaluation of practicable future strategies that may enable faster water business change and therefore the ability to decide today on the shape of the future is the key challenge for water utilities' top management. The more management can achieve an economic balance between meeting customer requirements and investors' expectations of reward, the more competitive their business will be.

Such a mission requires the definition and adoption of strategies that adequately meet shareholders' economic expectations or, in other terms, can 'create economic value' for them, while improving business performance and increasing the level of service provided.

According to the IWA Reference Paper on sustainable cost recovery, a water services undertaking needs to achieve and maintain a specified standard of service, both for present and future generations, either through affordable water charges, as is often the case in developed countries, or through a combination of water charges and targeted, reliable, long-term government subsidies, as is the case in many developing countries.

Given that water policies cannot be effective and compliant with this goal without a clear breakdown of responsibilities between public authorities, service operators and financing organisations, being well informed about the latest international water data allows utilities to preserve good governance and management schemes and gives the water sector a proper, functioning framework.

IWA Statistics and Economics Specialist Group

To help achieve this, the IWA Statistics and Economics Specialist Group (SG) is keen to provide a forum where professionals and academics can debate how utilities are financed, their various water tariffs structured and performance measured.

Among its institutional activities, the Group has a particular focus on sharing information, experience and fundamental and practical issues relating to current pricing and funding practices that water utilities need to consider as economic and responsible behaviour.

This September the Group finalised and presented at the IWA World Water Congress in Vienna the latest revision of its leaflet on international statistics for water services. Based on detailed surveys, this covers the entire water cycle from drinking water to wastewater treatment, providing figures for tariffs, abstraction and consumption around the world.

Thanks to the cooperation of a panel of water professionals from utilities, national organisations and universities, who take the responsibility for providing data, the SG's Task Force on Statistics is able to update this leaflet every two years. This has always been presented both at the biennial IWA World Water Congress and to the IWA community via its website (which can be accessed by logging onto the SG's web page at www.iwahq.org).

Domestic water charges (analysed for a normalised consumption of 200m^3/year and expressed in US dollars) and key figures for services provided can be accessed for utilities around the world, both in terms of a country in general and the main cities within that country.

When information from previous leaflets is compared, it may even be possible to observe trends over time, giving due consideration to the double-digit fluctuations in the exchange rate against the US dollar over time and across regions.

Prices, however, do not necessarily provide a true comparison of the full costs of providing water services, because some costs may be recovered from sources other than the customer.

The SG's Task Force on Statistics focuses its activities on developing this leaflet, benefiting from the voluntary work of its members and helped by the IWA's structures. Collecting data involves contacting national organisations, regulators and utilities across all five of the world's continents by email, and sending a well-devised questionnaire that asks for data for both a country in general and the five main cities within it.

Gathering data

The last survey began in late 2007 and obtained over 30 answers, which have been processed and provided results that were converted into tables and graphs about:

- the annual bill for water services (200m^3/year referred to and expressed within the component values) as of December 2007:
- abstracted annual volumes (disaggregated according to sources)
- delivered annual volumes (distinguishing households and small businesses from industrial and other consumers) and service coverage rate
- abstracted volumes per capita per year
- the gap between abstracted and delivered volumes
- specific water consumption per capita per day
- the connection between drinking water charge and GDP (to give an idea of the affordability of the water charges)

All volumetric data were checked as calculated in December 2006.

Expanding the survey

It needs to be emphasised that unfortunately, and notwithstanding

the successful welcome the survey has been given so far, it has proved difficult to increase the number of respondent countries, which prevents the IWA community from periodically updating important information and comparisons in an international context.

For this reason, this article not only aims to offer water professionals and interested stakeholders who were unable to attend the Congress an opportunity to understand what happens behind closed doors, but also to invite them to visit the SG's web page and actively cooperate in maintaining, and hopefully enhancing, the high value of the statistical information provided.

2007 survey

Data from the survey shows that in 2007, consuming 200m^3 of water in Geneva, Switzerland, mean paying nearly $625 for potable water, a figure that increased to nearly $930 when sewerage, wastewater treatment and taxes are taken into consideration. In the same year, for the same amount consumed, the most expensive water bill was paid in Aarhus, Denmark – close to $1425 (nearly $347 for potable water and close to $1078 for sanitation and taxes).

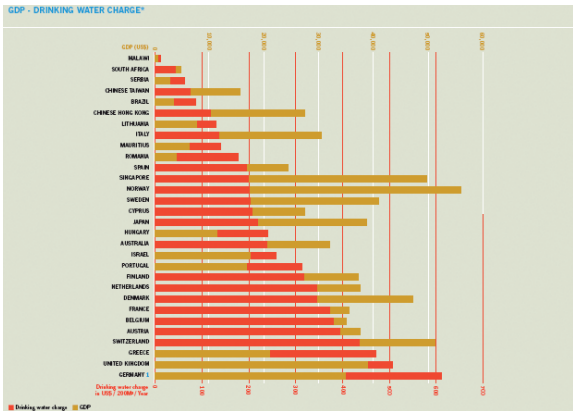
At the other end of the scale, in the city of Blantyre, Malawi, consuming 200m^3 of potable water meant paying around $3 and in the city of Johannesburg, South Africa, close to $50, as in both cases sanitation and taxes are not charged.

In ten cities the annual global price for water services (200m^3 normalised) was more than $1000 (in 2005 only six cities had prices at or above this level); in 77 cities the price ranged from $500 to $1000 (up from 40 cities in 2005); 52 cities had prices of between $100 and $500 (up from 49 cities in 2005) and seven cities had prices below $100 per year (the same number as in 2005).

On average, drinking water charges represented nearly 39% of the water bill while nearly 38% was attributed to sewerage, nearly 7% to wastewater treatment and nearly 15% to taxes and other charges.

This seems to suggest a general two-year growth in prices (which at first glance appears more acute for sanitation than for drinking water), though it needs to remembered that even if expressing prices in a uniform currency allows information to be compared, when comparisons cover different periods, movements in the exchange rate due to the depreciation of the common currency may enhance or depress the gap observed over the time period involved.

This is particularly true of the US dollar, which has recently suffered a



double-digit depreciation both against the Euro and in general against all the other currencies of the cities surveyed.

The 2007 survey shows that more than 40% of total water abstraction came from groundwater in 40% of the countries surveyed and from surface water in 50%, whereas in 2005, 47% of water abstracted came from groundwater in the surveyed countries and 27% from surface waters. Such a movement from ground to surface waters seems suggestive, on the one hand, of strong action against pollution and closer attention to water quality improvement, but from the serviceability perspective, the increase in vulnerability to climate change seems evident.

It is also possible that such a change in the relationship between the water industry and the environment, and the associated major expenditure, could explain the increase in water charges.

Populations in the countries surveyed ranged from 1.2 million inhabitants (in Mauritius, where nearly 100M.m^3 of water was delivered in 2006) to over 128 million inhabitants (in Japan, where nearly 14B.m^3 was delivered in the same year). Potable water supply coverage in all the countries surveyed ranged from 90% to 100% of the population, except in Serbia, Romania, Malawi and Lithuania, where the coverage ratio was around 70%. Sewer and wastewater treatment minimum connection ratios were found in Brazil (where 39% of the population had a sewer connection) and in Serbia (where 25% of the population has a wastewater connection) while the maximum ratios were in Singapore and The Netherlands (between 99% and 100% for both types of connection).

Comparing the results from the last two leaflets and the relations between water abstraction and delivery, very poor elasticity of domestic water demand can be observed, notwithstanding the increased charges.

Drinking charges and wealth

Relating drinking water charges to the Gross Domestic Product (GDP) of a country can give a macro idea of how water charges could be related to average domestic wealth, allowing a preliminary approach to water charging affordability to be drafted. GDP is the standard measure of the income generated by productive activity, so total GDP is normally used as an indicator of the size of a country's economy, while per capita GDP is a broad indicator of economic living standards.

Relating the national GDP to the national average charge for 200m^3 of drinking water in the countries studied, via a linear regression model, shows at a first glance a considerable degree of affordability and a relationship between the two variables that is the correlation measured by the coefficient R2 at around 49% (which expresses, in percentages, how the fluctuation of the independent variable, 'water charges', may influence the overall variability of the dependent variable, 'affordability').

In order to better depict the water policy frameworks that utilities have to operate within, and to enable utilities to be well-informed about current international water data so that good governance and management schemes can be maintained at their best, the Specialist Group on Statistics and Economics undertook another survey of water regulation in Europe (summarised in WUMI, October 2006) that may add more information to that provided in the leaflet.

Some key issues can be derived from both of the above studies. Water resource issues are undoubtedly complex, even transcending the water sector itself, and macro-economic development, population growth and other demographic changes have greater impacts on water demand than water policies do. It is therefore of the utmost importance for water professionals to increase their understanding of the broader social, economic and political context that they operate in, and politicians and other key decision-makers need to be better informed about water resource issues, otherwise water will risk being an area for political rhetoric and promises rather than implementation of the actions that are needed.

The International Statistics for Water Services 2008 leaflet can be downloaded from the reports and documents section of the Statistics and Economics Specialist Group webpage at www.iwahq.org. ●

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The Philippines pilots water safety plans

Water safety plans have been piloted in the Philippines and look set to take off across the country. **LYN N CAPISTRANO** looks at progress to date, and the issues addressed.

With water quality that meets regulatory standards for human health, consumers in the Philippines can now be sure that their tap water is safe to drink. This improved consumer confidence is the result of a water safety plan.

Water safety planning, an effective means of maintaining a safe supply of drinking water to the public, was introduced in the Philippines in 2006 by the World Health Organization (WHO) and the Department of Health (DOH) with funding support from AusAID. Maynilad Water Services was selected for pilot implementation of water safety planning.

The main objectives of a water safety plan are the prevention of contamination of water sources, prevention or removal of contamination during treatment and prevention of contamination during storage and distribution.

A water safety plan is a tool for assessing and managing risks throughout the water supply system from catchment to consumer. To prevent disease outbreaks and protect public health, a water safety plan follows the hazard analysis and critical control points (HACCP) method, a systematic application of good practices for the production of safe water.

HACCP anticipates problems and designs the correct preventive solutions. With water safety plans, the reduced incidence of drinking water-transmitted disease outbreaks could generate socio-economic benefits.

As a risk assessment and management tool, a water safety plan ensures the delivery of safe drinking water to consumers. It identifies hazards that the water supply is exposed to and the level of risk associated with each; how each hazard is to be controlled and prevented; how the means of control and prevention will be monitored; how the operator can tell if control has been lost; what actions are required to restore control; and how the effectiveness of the whole system can be verified.

Improving services and safeguarding public health

Maynilad, which supplies water to about 6.2 million people in Metro Manila and Cavite province, was the first water utility in the Philippines to be trained in water safety planning.

Managers and technical staff of the utility were given orientation on the new WHO guidelines on drinking water quality, of which water safety planning forms a part. The trainees did a thorough assessment of the water supply process from water source to the consumers' taps, identifying hazards and risks along the way and what actions to take with regards to these.

After the training, Maynilad formed a water safety plan team representing task forces for water sources, water treatment, groundwater and distribution. WHO and DOH reviewed the water safety plan that was produced by the team.

Next to be trained by WHO and DOH in water safety planning was the Local Water Utilities Administration (LWUA), which works with 446 water districts. The main water service providers in the provinces, the water districts collectively serve 15 million people across the Philippines. Water districts that will implement water safety plans are likely to improve their operations and provide safe drinking water to a significant number of people.

LWUA is taking the first steps in making water safety planning a part of its training package. The water safety plan concept is now also being endorsed by the Philippine Association of Water Districts.

The Maynilad water safety plan now serves as a useful document, according to Environmental Management Department manager Annie Calderero.

When turbidity at one of the dams exceeded the limit, the Maynilad water safety plan, which stipulates what to do in such a situation, was followed, including hourly monitoring, immediate relaying of information, response time and corrective action.

Protecting public health

Preventive risk-management approach to the supply of drinking water is the most reliable way to protect public health. In a comprehensive water safety plan, water suppliers and health authorities have plans that include clear guidance on when to issue warnings to consumers, and how these warnings are to be communicated in the case of water contamination and disease outbreaks. The integrated nature of water safety planning's prevention-based approach to managing water supplies safeguards public health.

The Philippine National Standard for Drinking Water has included a section on water safety planning. All water providers, including water refilling stations, are now encouraged to have water safety plans.

DOH and the local government require water refilling stations to have a sanitary permit before they can operate as a business entity. To obtain a sanitary permit, the owner and operator of a water refilling station are required to attend a five-day training course that includes HACCP, a basic part of water safety planning. Engineer Joselito Riego de Dios, the Chief Health Program Officer and officer-in-charge of the water and sanitation division of the DOH's National Center for Disease Prevention and Control's Environmental and Occupational Health office, says: 'Before it can operate its business, a water refilling station in the Calabarzon region is now required to submit its HACCP programme.'

DOH has developed and made operational a policy on drinking water quality standards and is providing technical assistance to barangay (village) and municipal (town) local governments for its enforcement. 'DOH is working to make water safety planning a policy involving certification, monitoring, and performance audit,' engineer Riego de Dios adds.

During relevant national and local conferences, DOH (www.doh.gov.ph) tackles the new edition of the WHO Guidelines on drinking water quality, which includes the water safety plan framework.

Some water utilities in the Philippines are starting work on water safety plans. The Philippine Water Works Association, with technical support from WHO and DOH, is conducting training on water safety planning for the Ilocos Norte water district. This will be followed by similar training for the water districts of Angeles city and Davao city.

LWUA is encouraging water districts to undertake water safety planning – indeed, the Calamba water district will soon be financing the development and implementation of its own water safety plan. Water safety planning is also now being taught to students of Masters degrees in engineering at the University of the Philippines National Engineering Center.

Needs and challenges

Access to safe drinking water is a basic human right, necessary to sustain a good quality of life. Water safety

planning prevents disease outbreaks, which have negative implications for human health and development. Unsafe drinking water is a human development challenge for a vulnerable country like the Philippines.

The usefulness of a drinking water safety plan needs to be widely communicated to the general public, as well as to regulators, national government agencies, local governments and civil society organisations in order to be appreciated. Public awareness, to foster a better understanding of water safety plans, is particularly needed because there are various types of water service provider in the Philippines. Given the integrated nature of water safety planning, the active cooperation of all stakeholders involved in managing water supplies is necessary.

Water utilities and service providers will need manuals that provide practical guidance on how to undertake and implement a water safety plan. Such manuals will complement training on capacity building for water safety planning and encourage its wider implementation to more water providers. As training in water safety planning gets under way for urban water utilities, the need to develop prototype localised training and educational materials for use in rural community settings is recognised.

Another challenge is convincing policymakers to scale up water safety plan implementation. Research on the cost-benefits of water safety planning for urban water utilities could be used to advocate their use. The lack of funds for investing in improved water supply services, and the production of relevant information materials in the local language and context to ensure water safety plan implementation, also remain as challenges.

For the government, the key challenge is monitoring and evaluation of water safety plans as well as the need to ensure the benefits of water safety planning under its regulations.

Despite the needs and challenges, the water safety plan pilot project in the Philippines has showed that cooperation among stakeholders, along with the high level of expertise in water and sanitation at DOH, Maynilad and LWUA, has been able to move the process forward. Water safety planning is within the drinking water safety framework of the Sanitation Code of the Philippines and the country's Clean Water Act. With adequate funding and technical support, the future of water safety planning and implementation in the Philippines looks bright.●

The author:

Lyn N Capistrano, Philippine Center for Water Sanitation.

Putting the customer first

Wessex Water has implemented several schemes to maintain and improve its customer service approach. **LIS STEDMAN** speaks to the company about generating customer satisfaction.

Wessex Water, which serves over 2.5 million customers in the south-west of England, has an enviable reputation for customer service that has been underlined by a number of top awards.

The company is regularly at the top of the list of water service companies for its quality of telephone call handling performance, according to the levels of service data of economic regulator Ofwat. Sue Lindsay, the company's head of consumer affairs, says: 'Customer service is very important to Wessex Water. We have worked very hard to become a service business that delivers what its customers want.'

She adds: 'This ethos is ingrained across the business – a culture of delivering excellent service. We really do want this, from the top to the guys on the ground. We are a small local company and we are proud to be close to the local community. [Colin Skellett], our executive chairman for 20 years is committed to putting customers first, so this approach has cascaded through the company.'

Mr Skellett's commitment of putting customers first means the whole business ethos follows, Ms Lindsay explains. For instance, the company undertakes a great deal of work obtaining customer feedback, and has a customer non-executive director as well as a sustainability non-executive director on the board, so the customer voice is a key part of the executive.

The company also has two customer liaison panels that meet two or three times a year and consist of customer representatives with the customer non-executive director as chair. 'We really do listen to what they bring to us,' Ms Lindsay stresses.

'Customer research includes regular satisfaction surveys, which are carried out with customers who have contacted us, whether it is a single call to pay a bill or a more complex operational contact. An annual image tracking survey is also carried out with customers in our region many of who have not contacted us, to ensure a wide range of views is captured.'

For those who have made contact, Ms Lindsay explains: 'We look at the end to end process, starting with the person that answered the phone and finishing with the guy driving off from site.' The company's record is underlined by the fact that last year research showed that 98% of its customers thought it was good or very good.

She notes that the company wants to deliver excellent customer service all of the time, and to make the customer's journey 'as good as it can be – we want to delight as much as possible,' she says. Pragmatically, though, she notes that the company accepts that sometimes things do go wrong, no-one is infallible. 'We ask for both positive and negative feedback, and encourage this. Where we do get things wrong we fix them as soon as possible. We have got an excellent compensation package – the Wessex promise is one of the best in the industry. We like to be the best – we do more than is required and provide more compensation than is required, on a no-quibble basis. We apologise, rectify and compensate.' Ms Lindsay adds: 'What we aspire to is what makes us and other top performers different.'

This approach will stand the company in good stead for the changes that are due to take place – Ofwat is to measure customer metrics somewhat differently going forward, changing the focus of some of the performance indicators in the Overall Performance Assessment from measures of speed of response, for instance, to focus more on the customer experience.

The new system, which is still in the early stages of development, will look at such issues as how many avoidable complaints a company has received, for example, which is a more accurate measure of failure to meet customer expectations. This is very much in line with Wessex Water's approach. 'The idea is that you may reply to your

complaints within the allowed number of days, but you shouldn't be getting them,' explains Ms Lindsay.

Wessex Water's call centre work has been recognised for its excellence not only by Ofwat in its DG9 quality of telephone call handling performance survey but through external awards. 'We have come top of the water service companies in every Ofwat DG9 survey so far and we believe it is our approach to telephone answering that makes the difference.'

One key difference is that the company is firmly committed to 'warm voice' telephone answering, she adds: 'We don't have a 'push one and two' automated service. We have a few dedicated 24 hour lines for leaflets and payments, but if you ring the main number you are answered by a local person who is in touch with local issues and can understand and sympathise. There are cheaper ways – such as offshore call centres or automation, but we have said absolutely not. We think that's what has led to customers voting us first.'

The satisfaction surveys consistently praise the company's telephone answering performance, which separates it from many of the other major companies – not only utilities – in the UK. Ms Lindsay also emphasises the importance of staff retention in maintaining this impressive track record. 'We use agents that are very well trained, and we keep them for a long time. We have a stable group of people, so experience can build.' Not surprisingly she adds: 'We see the call centre as the door into the business. The first person you speak to as a customer is the call centre and the service has to meet that challenge.'

With operational calls, where a company representative may have to visit a property, it is important to ensure the times of visits meet customer expectations, that standards of conduct are high and that the company communicates effectively and keeps the customer informed, she explains. 'It's an ethos we spend a lot of time trying to build into the workforce.'

Affordability

Affordability, another critical area of customer care, has won the company a key magazine industry award for customer care due to its tariff for customer in financial difficulty. The company has also won a prestigious Best Creditor Award from the Citizen's Advice Bureau (CAB) – 'their equivalent of an Oscar,' Ms Lindsay explains. The company is also unique among the water utilities in winning a Queen's Award for Enterprise, something it is very proud of.

'Our approach to debt collection is that there are generally two types of customers – there are those who can pay their bills but for some reason do not want to, and we try to take a fairly tough line with those people. But there is another group that simply cannot afford to pay. For these customers in financial difficulty we have come up with a range of schemes to help them get back on track supported by very successful partnership working with Citizens Advice Bureaux in our region. We work very closely with them. We fund CABs across our patch – we put in £250,000 ($392,131) each year in direct funding for the provision of debt advice for customers,' says Ms Lindsay.

Wessex Water flags up this service with customers that are experiencing difficulties, 'because we believe that the CAB is best placed and has the experience to offer independent advice and assess ability to pay. When a customer phones a creditor, they may say what they think the creditor wants to hear. The CAB offer an independent debt assessment providing holistic debt advice. They can maximise income as well – often people are not getting the benefits to which they are entitled. Then they will come up with sustainable payment plans for creditors. We believe it is a better approach.'

> *'There are cheaper ways – such as offshore call centres or automation, but we have said absolutely not. We think that's what has led to customers voting us first.'*
> **Sue Lindsay**

Wessex Water itself offers a variety of schemes – Restart and Restart Plus are two year schemes for those already in debt, to help them get back on track. The company writes off an equivalent amount of debt in the first year to that which the customer pays. In the second year the customer continues to pay and the remaining debt is then written-off. The important thing with this approach is that the process engages the customer and forms a habit of payment ensuring the customer is back on track after the two years – it has also been hugely successful, Ms Lindsay reports.

Collecting the Citizens Advice Bureau social policy oscar award (Sue Lindsay far left). Credit: Wessex Water

The much-praised new Assist tariff was introduced in recognition of the fact that some customers simply cannot afford to pay their bills. 'If a customer goes to the CAB and is on one of the main means-tested benefits, and the CAB believe they cannot afford to pay their current bill then they can be put forward for the Assist tariff. This is first tariff to be based on the ability to pay.' This tariff was important to winning the industry award, the Queen's Award and the CAB accolade.

Wessex Water also keeps an eye on other companies' customer service efforts in its efforts to remain at the top – benchmarking, in various forms. 'We do benchmark against other water companies – we like to be offering the best there is. We also ask our customers within the surveys how they rate us against other utilities, and a lot of the time they say we're much better.'

The company has undertaken a 'huge amount' of research in the build-up to the draft of the next five year business plan (AMP 5), asking customers which company brands they admire and why, and has led discussions about where its customers want the company to be – all of the companies have had to produce 25-year vision statements on this topic so the customer work has contributed significantly to this.

'We asked our customers what their aspirations were for us, as I would imagine a lot of the other companies will have done,' Ms Lindsay says. There is also another significant potential future benefit to focusing intensely on customers. 'If competition does open up – and we're clear that if it does then it needs to be for the benefit of customers – we want to be in a position where if customers were asked they would pick Wessex Water.' The company is working extensively with Ofwat on preparatory work such as accounting separation – how to separate out the retail business so that it is more in tune with its customers.

Of course, it is early days in terms of even thinking about universal competition. But Wessex Water's focused engagement with the community that it serves is undoubtedly standing it in good stead not only for its present challenges but for the future as well. ●

Exporting Israel's water security expertise

Israel-based company Whitewater Technology offers a whole-system security package for utilities, protecting the water supply and providing management in the event of an emergency. **LIS STEDMAN** explains how this security solution works.

Whitewater Security, a subsidiary of the Whitewater Technology Group, has introduced to the market a comprehensive security solution for water utilities and municipalities. Its unique selling point is that it combines in one package the various disparate aspects of security rather than treating them as separate issues.

The company's approach differs from other offerings in combining an individually tailored security plan with the latest tools and expert training to enable water authorities to take full control of all aspects of their water systems. Whitewater Security recently exhibited its offerings at the giant Weftec show in Chicago, attracting a great deal of interest.

Its security system is founded on an in-depth needs analysis and covers across-the-board water crisis management including protection, monitoring and contamination detection. Designed and implemented by security specialists, the Whitewater solution aims to protect against either deliberate or accidental contamination, minimise infrastructure vulnerability and ensure a continuous supply of safe water.

The customisable tri-phase solution involves a thorough assessment of vulnerability, development of a specially tailored security programme, implementation and support. The end-to-end offering incorporates a broad range of components that include area mapping, supervisory control and data acquisition (SCADA) control, a decision support system, physical security monitoring and crisis management procedures.

Company CEO Dovev Levinson explains: 'There are a range of threats to water systems, which are usually approached like islands – there is a physical solution island, a monitoring systems island, and a consultancy services island. Each island can only provide a partial solution to a particular problem. Our solution integrates the islands into a comprehensive solution.'

Water protection experience Israel-based Whitewater integrates advanced technologies from both the security and water fields to deliver effective, unified strategies, he adds. It offers a real-time, online solution that integrates seamlessly with SCADA systems. Whitewater's technologies take advantage of the military experience within its specialist team, which has a deep understanding of the serious threats in today's world. The company also works closely with Israel's national water utility, Mekorot, which has decades of experience in protecting water quality.

Mr Levinson notes: 'This is the first time that Israel has exported its knowledge, expertise and technology in the field of water security. Our approach is based on integrating physical security elements such as monitoring systems with information from external systems such as customer complaints.'

> *'When you are talking about water security, both intentional and unintentional, terrorism might be more frightening but accidental contamination is much, much more common.'*
> **Dovev Levinson**

Whitewater Security's continuously updated solutions protect against operational error and can provide crucial assistance to municipalities in the aftermath of natural disasters such as earthquakes and storms as well as deliberate acts. Warning of contamination, the solution is claimed to reduce both health risks and the costs associated with contamination of water supply systems, from whatever cause.

Decision support system

Key to the solution is its decision support system (DSS), which Whitewater developed with high-tech engineering academy Technion. The DSS is able to detect direction of flow in a water network, which enables it to assess the correct decision in the event of a contamination event – assessing how much time the contamination would take to reach any particular point and what actions should be taken in any instance, such as the opening or closure of particular valves.

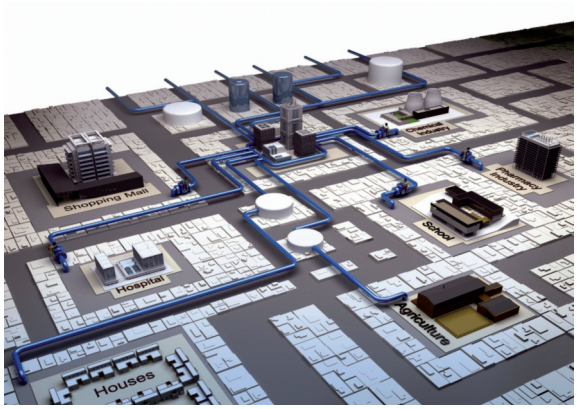
The system processes receive input from a wide variety of sources, including public information, physical security and water quality monitoring sensors, as well as the external systems and data mentioned above via Whitewater's specially-designed water security SCADA.

This evaluates the information it receives and when it recognises a credible threat it alerts and triggers action. Mr Levinson explains: 'The water security SCADA includes the DSS, and is able to provide a total water security solution.'

Operators can monitor the processes and view videos, tables, graphs, Geographic Information System (GIS), short message service (SMS), email and network decisions. Intelligent corrective action can be taken rapidly, either automatically or manually, using information from the system including data derived from the DSS.

In actual crisis situations, pop-up windows provide instructions about procedures to control and manage the event. The real-time, online system enables authorities to quickly grasp, control, and manage all events throughout the water supply chain – including the pinpoint monitoring of specific locations within cities.

There are other elements of the system that are not connected to the DSS or SCADA – the company works with experts in intelligence across a



range of media, who provide specific information focused on water security at any specified location. The company is involved in providing this service to 'one of the global giants in water', Mr Levinson says.

Dealing with threats

The threats that the company's security offering can address range from terror, accident, malfunction and natural disasters to climate change. Recovery is another aspect that the company covers, providing mobile decontamination systems either at a personal, family, building or mobile container level – its units were used in the aftermath of the recent earthquake in China to allow potable water to be abstracted from raw surface water supplies.

One of the key benefits of the solutions the company offers is the broad range of threats they can deal with. 'When you are talking about water security, both intentional and unintentional, terrorism might be more frightening but accidental contamination is much, much more common,' comments Mr Levinson. 'Our solution deals with almost any kind of threat imaginable, dealing with all the aspects. Monitoring detects contamination, whether it is intentional or unintentional.'

The company cooperates with suppliers of technologies such as chemical, biological and even radioactivity monitoring equipment around the globe. In its unique position, Mr Levinson is confident it can provide the levels of security that utilities are increasingly realising that they need. ●

About Whitewater

The Whitewater Technology Group was founded in 2006 by Ori Yogev and Hana Gertler, and focuses on solutions to the growing global water crisis. Whitewater's efforts to meet the needs of the water industry have already borne fruit, as can be seen by early sales in the US, recognition by the EPA and certification of a number of its products.

Whitewater Security also aids municipalities in the US, Europe and other developed nations by sharing its expertise in areas including security programme development, utility measurement and self-assessment, monitoring and identifying contaminants, sensor improvement and early warning detection, analysis of pipe transfer of water contaminants, risk evaluation of contaminated drinking water, water utility operation, strategy development and planning for emergency backup and crisis situations.

Among Whitewater's offerings are rapid, sensitive bioassays developed by CheckLight. These sophisticated solutions use non-pathogenic luminous marine bacteria as sensors in the monitoring of water quality.

The company sees its mission as ensuring an ongoing and efficient supply of clean, safe, high-quality water by creating a 'technological powerhouse' to develop new concepts, models and systems – and ongoing delivery of advanced water technologies to municipalities in the western world. To this end Whitewater identifies, nurtures, invests in and acquires selected high potential, cutting-edge water technology companies in Israel.

Ten years' experience in south eastern Europe: *a best practice report*

Austria's status as a smaller bilateral donor has led it to think carefully through its approach to projects. **CHRISTOPH PRANDTSTETTEN** of Kommunalkredit Public Consulting (KPC) sets out the country's views and experiences.

The Austrian Development Cooperation (ADC) has supported the countries of south eastern Europe since 1994. From the foundation of the Austrian Development Agency (ADA), which is the ADC's operational unit and competence centre, ADA has been responsible for implementing projects and programmes as well as administering their budgets.

Kommunalkredit Public Consulting (KPC) has been the ADC's consultant since 1994, and is responsible for identifying and monitoring over 100 projects and programmes in the water supply and sanitation fields in south eastern Europe.

ADC's main goals are to reduce global poverty, safeguard peace and security, and preserve the environment. South eastern Europe has made considerable progress in economic transformation and democratisation, but is still politically unstable and economically weak. The ADC therefore supports the region's countries in their efforts towards EU integration, transformation and lasting peace. Albania, Bosnia and Herzegovina, Kosovo, Macedonia, Montenegro and Serbia are the priority countries in the region.

Programmes and projects focus on issues including the private sector and development, education, the role of legislation and civil society, and environment, water and energy (in particular, improvements to infrastructure required for economic development, promotion of innovative environmental projects, improvements to water supplies and use of renewable energy).

The ADC coordinates closely with other Austrian funding agencies and seeks synergies with private businesses in the country. Regional cooperation and donor coordination is also an important component of its strategy in south eastern Europe.

ADC guiding principles

Water sector measures must be based on a holistic, strategic, well-coordinated approach in which the basic conditions are aligned. This is because water is a limited and potentially endangered resource and also because there is need to consider the complex interactions in the sector and the need for sustainability, which can only be obtained by building up the necessary institutions and competences.

There is therefore an important principle of combining 'hardware' – infrastructure improvements – and

'software' measures such as strengthening institutions, raising awareness, training and creating a legislative framework. Connected issues must also be taken into account – for instance, water supplies must take into account the resultant wastewater.

This can only be achieved by using a programmatic approach that is well-integrated into national structures and considers at least a larger, connected area rather than a single, local issue. As a basis for planning use of water resources, Integrated Water Resource Management (IWRM) principles should be used.

Sustainability

A basic supply of potable water is a human right, so meeting the basic water needs of all population groups is a high priority. One of the most important criteria when choosing the correct technologies, the necessary level of provision of services and the operator model is affordability.

Sustainability is a key basic principle for all measures in the water sector. The ADC's goal is to secure a high-quality sustainable development process. Evaluating the success of the ADC's actions based only on output, the short-term achievement of the required supply ratios or the economic efficiency of implementation cannot therefore be justified.

There are a number of dimensions to sustainability that must be considered in detail. Financial issues include affordability, that is, covering at least the current operating and maintenance costs from appropriate incomes, and investment in solutions adapted to economic realities.

Technology is another issue – the choice of adaptive and flexible technologies, provision of technical training and securing a supply of spare parts. There is also an institutional dimension, which involves building up lasting and efficient operator structures and regulatory authorities.

Social aspects are also important – the enforcement of personal responsibility and awareness-raising among the population, and implementation of transparent decision-making processes that include all population groups. Finally, ecological issues must be considered – the protection of resources from contamination and excessive use.

The use and stabilisation of local institutions (rather than parallel structures) is an important element within a sustainable approach. Also key is having a clear approach to an increasing transfer of responsibilities (phasing out) and subsequent support (backstopping). Rehabilitation or replacement of existing infrastructure has to be based on detailed analysis of past problems to avoid similar failures in future.

Adaptation to the socio-cultural and socio-economic context

All measures in the water sector have to be adapted to the social, cultural and political context. The ADC feels it must apply the sustainable livelihood approach, which takes population perceptions into account as well as their strategies for securing their daily existence, integrating their abilities, resources and patterns of action.

Technologies and planning strategies are 'adapted' if they correspond to demand, the socio-cultural needs and the solvency of the population, as well as the available organisational and technical capacity. Adapted technologies have to offer flexible mechanisms for adaptation and expansion. Traditional forms of allocation and cultivation of water resources must be considered and enhanced with respect to poverty reduction and distributive justice.

Participation, personal responsibility and demand

ADC supports a demand-driven, participative approach that focuses on the most possible co-determination, cooperation, acceptance, identification and personal responsibility among the target population group, as well as the use of local potential.

Participative planning, mobilisation and awareness-building enable local populations to make well-founded choices based on personal needs from among the technical and institutional options available. In this way, it is possible to ensure that disadvantaged groups in particular are properly integrated into the process. A participative approach is particularly important in the sanitation sector, as hygiene improvements in individual households cannot be achieved by regulation alone.

The population should provide co-payments for implementing the measures, depending on their financial circumstances, and should be responsible for maintaining the infrastructure. They should also have representatives in the newly-created institutions and act as their controlling body.

Cucer Sandevo wastewater treatment plant (see box). Credit: Kommunalkredit Public Consulting

Situation

In south eastern Europe, even in the new millennium, there are still many – mainly rural – settlements with low quality water supplies and significant network losses of around 50%. Many settlements have no water network and almost every city undergoes water shortages, particularly in summer. There are also insufficient connections to water and wastewater treatment works.

A functioning and sufficient water supply and wastewater disposal directly enables improvements to quality of life and hygiene. Creating primary supply systems can help to reduce migration from rural areas to cities, which means that populations remain in their regions and can achieve further development.

Environmental trends

Key environmental trends include war and ethnic conflicts – the military conflicts of the Balkans have on one hand led to a general economic crisis, resulting in a reduction of air pollution, and on the other to poor maintenance

Active leakage control to combat water loss

Leakage is still a key problem for the existing utilities. The lack of well-structured water utilities has led to high losses in supply systems and, depending on the systems' structures, to high operational costs and poor customer service. Customers are frustrated and not prepared to pay for poor services, which leads to low fee-collection and low incomes for the utilities as well as often times illegal house connections. Limited water utility resources lead to a lack of operation and maintenance – a vicious circle. Consequently, many customers experience intermittent supplies.

In general, once an intermittent supply is established, service lifetime will decline due to frequent, rapid changes of pressure. Burst frequency increases significantly and efforts to improve the supply have limited effect. Usually water consumption does not decrease as customers install tanks to store water for their daily use, which means that the same amount of water is supplied over a shorter period, which means larger pumps and pipes have to be installed and the system becomes inefficient.

As the supply is not permanently pressurised, contaminated groundwater or wastewater can enter the system, which renders the water non-potable.

To return to a continuous supply requires considerable investment and awareness of the problems. A clear political mandate should make utilities accountable for providing good services and continuous supplies. Water utilities need trained staff to undertake technical and administrative tasks.

Professional active leakage control, which requires modern equipment, well-trained staff with considerable experience in leak detection and repair, plus ongoing re-training combined with pressure management provide a basis for improvement.

In rural areas, leakage control is best achieved at a regional level by pooling the activities of a number of utilities or by contracting experienced private providers of leakage control services.

of existing environmental infrastructure, made worse by the increasing migration of the population from rural to urban areas. Further consequences include accumulations of dangerous, untreated waste, the destruction of landscape and the creation of mined regions, as well as the presence of partly-deactivated bombs and radioactive ordinance. Environmental problems were also marginalised because of the urgent day-to-day problems of the population.

After 1990, contamination patterns in the reformed states began to approach western European levels. The causes included increases in traffic, municipal waste and contamination from small enterprises, introduction of new chemicals and materials, more complex small-scale 'pollutant cocktails' in the air, and the sealing of formerly-protected areas. Economic growth has caused an increase in old pollutant emissions over the past few years, mainly due to a lack of energy efficiency.

In the second half of the 1990s, the environmental debate in the region focused mainly on the vast investment costs allegedly needed to adapt to western European standards. An often-quoted EU study suggested an investment of up to €100 billion ($128.6 billion) would be needed to enable ten eastern European states to reach European Union (EU) environmental standards.

The size of the investment is questionable, as in many cases it was assumed that modern, western technologies would be adopted. The size of the estimated costs also led the EU's grants programme to focus on expensive investment projects. Non-governmental organisations (NGOs) have criticised the lack of consideration of 'least-cost' options and use of local know-how.

Unlike the investment costs, operational expenses for environmental infrastructure in south eastern Europe are not given sufficient consideration. This is possibly because heating fees and water tariffs are paid by local populations whereas new infrastructure projects often require international finance. It is however a fact that in some south eastern European states, the very high heating fees contribute significantly to poverty. Although the price of energy and water is considered to be very high by most of the population, the tariff normally does not cover costs. Fees will rise further in future, if no investment is made in energy efficiency. Cost-saving investments in water and wastewater utilities are therefore urgently needed.

Infrastructure issues

The rate of connection to the public water and wastewater supplies in south eastern Europe is still unsatisfactory. Only 40% of Macedonians and 60% of Croats, Serbs and Montenegrins were connected to wastewater systems at the end of the 1990s, and just 40% to 50% of municipal waste in Albania and Bosnia-Herzegovina is collected. Apart from the positive effects of isolated environmental investments in the 1990s, insufficient progress has been made to overcome the general deterioration of the infrastructure.

Specific problems

A number of potable water supply problems need to be addressed:

- the condition of the water supply systems in many cities is unsatisfactory
- there are not enough wastewater systems
- there are only a few adequate water supply systems in rural areas
- the wastewater systems in many urban areas are in poor condition
- there are high water losses and very low water-use efficiency
- there is a shortage of potable water
- system operation and maintenance is inefficient
- public utilities have a low rate of

Illegal connections. Credit: Kommunalkredit Public Consulting

A comparison of Macedonian and Austrian water and wastewater tariffs

Based on an average annual income of around €3500 ($4503) per household in Macedonia, the annual water supply and sanitation bill of around €170 ($218.6) is 5% of total income. In Austria, the average annual income is €30,000 ($38,567) and water and sanitation costs around €600 ($771), that is, 2% of income.

revenue collection
- there is no regular monitoring of water quality and quantity in rural systems
- there is no database at a national level of drinking water supply issues
- there is low public awareness of wastewater as a pollution source

Cross-cutting issues

Adequate provision of water and sanitation is a prerequisite for a healthy and equitable society, both in terms of health improvements and in enabling children to attend school.

Good governance is required, to ensure all citizens' water needs are considered and the institutions responsible for managing water and wastewater are accountable whether they be public, private or community organisations.

Resource protection is vital, not only of the water supply but also other elements of the natural cycle such as soil and plants. Activities such as over-abstraction and wastewater discharges may endanger ecosystems. Awareness-raising is needed to counter these negative effects.

Discharges of raw wastewater into the environment cause widespread pollution. Interventions that improve sanitation should also contribute towards improving the quality of the environment and protection of natural water resources. Reuse of treated wastewater and sludge can also be integrated into farming practices, contributing to the development of local agriculture and aquaculture systems.

Lessons learned and best practice

Since the mid-1990s, ADC has used a strongly results-oriented approach, which means particular attention was paid to concrete results although budgets were tight. This is why studies and pure consultancy has rarely been financed – the main target has been small and medium-sized projects that could serve as best practice for other donors and regional or national investments.

Austria is a small donor compared to other bilateral and multilateral donors. This encourages speed and flexibility and is why the country can react to changing situations very quickly. On the other hand budgets are quite small, with the average project budget being around €1 million ($1.28 million). In line with the Paris Declarations, Austria tries to harmonise its policies, strategies and activities with other bilateral donors such as Switzerland. Cooperating with other donors, Austrian activities can have a greater impact.

In principle, longer-term development projects have substantial advantages. Not just technical aspects but institutional partnerships between project partners can be developed, ensuring the success of the activities and enabling local know-how and experience to be leveraged.

One key reason for success is the efforts of Austrian consultants to use and implement lean and adapted technologies such as constructed wetlands or lagoons, which reduce investment, operation and maintenance costs on one hand and on the other hand achieve EU requirements such as those of the Water Framework Directive.

Key experiences and lessons learned include:
- stakeholders, most importantly citizens, must be involved
- the finished projects have had a vital and sustainable impact on the population and environment
- An emphasis on institutional measures in recent years has made it possible to train the staff of operators in implementing a water tariff system and managing the necessary business instruments
- the exemplary nature of the projects and the possibility of reproducing them has enabled interventions to be achieved in other municipalities. A key aspect is the use of simple, sustainable technology with low operational cost and effort, such as the constructed wetland in Jasenovo and the aerated lagoons in Krivogastani

Water supply and sanitation for Cucer Sandevo, Macedonia

The first support project in 2000, which created a reliable water supply, was the first step towards long-term cooperation with the municipality of Cucer Sandevo, which is 12km north of Skopje and has around 10,000 inhabitants.

Due to the development of groundwater abstraction systems, the ideal preconditions for establishing a central water supply system, with clean drinking water, were created. New and rebuilt reservoirs and new connecting pipelines facilitated water supplies for most of the municipality.

In the first phase, the emphasis was on the urgently-needed construction of a reliable water supply, through investments in the infrastructure, and further work examined the technical and economic operation of the treatment works. A communal enterprise was inaugurated and supported throughout the project cycle.

The communal enterprise is the basis for sustainable operation of the water supply system. A water tariff model with functioning fee system that accounts for water use was created. As the operational tasks of the municipality and communal enterprise were optimised, the income increased and the utilities were therefore able to be operated and maintained properly. The water supply system project was completed at the end of 2004.

Because of the success of this project, another looking at sewerage and wastewater treatment began in 2006 and will finish this year. Special attention is being paid to implementing the simplest possible technologies, to ensure low operation and maintenance costs.

Leakage. Credit: Kommunalkredit Public Consulting

About Kommunalkredit Public Consulting

Kommunalkredit Public Consulting (KPC) acts as a partner for public-sector clients in Austria and many other countries around the world offering consultancy services for state and local authorities, publicly owned enterprises and International Institutions.

KPC supports its clients to identify and implement projects, programmes and public support instruments in the infrastructure sector and is specialised in offering economic and financial consultancy services during the pre-investment stage of projects. KPC's most important services include:

- needs assessment and project identification;
- preparation and review of feasibility studies, project contracts and financing schemes;
- appraisal of infrastructure investment projects;
- advice on preparation and implementation of PPP-projects;
- project management support throughout the project cycle.

In Austria, KPC is responsible for managing and implementing the state environmental grant scheme on behalf of the Federal Ministry for Agriculture, Forestry, Environment and Water Management. Kommunalkredit manages the entire programme from receiving the grant applications, appraising the project proposals (technical, economic and financial appraisal), concluding the grant contracts and fiduciary management (disbursement of the grant funds).

Another Austrian client is the Austrian Development Agency (ADA), Austria's bilateral donor organisation. The Agency is – among other activities – providing subsidies for water projects in the Balkan Countries, and Kommunalkredit is supporting them by providing project management and monitoring services and strategic advice. For example, Kommunalkredit recently prepared a water strategy for the Agency for the Balkan region, which it will use as a strategic reference framework for future activities.

KPC is also managing and implementing Austria's Joint Implementation and Clean Development Mechanism Programme (JI/CDM) where it is responsible for carrying out regular call for proposals, evaluating of the projects and negotiating contracts. Since the start of the programme in 2003 14 projects have been signed, representing around 14 million tons of Emission Reduction Units (ERUs).

- in the beginning, cooperation with south eastern European countries concentrated on water supply, but since 2004 there has been an emphasis on combining this with sanitation and wastewater measures. This reflects the important fact that improvements in water supplies are likely to aggravate pollution unless wastewater treatment systems are present
- ADC aspires to boost scientific cooperation and knowledge transfers between the region and Austrian academic institutions
- ADC's cooperation with other bilateral donors in the water sector enables financing of larger and more integrated projects such as interventions at a regional or river-basin level. Because of its experience and long-term presence in the region, as well as its good image and contacts with administrative authorities, Austria is able to take a coordinating and mediatory role as an 'honest arbitrator'
- over recent years, various local authorities in cooperation with international donors have written a number of strategy papers on the water sector. However, the structure and instruments to finance and implement projects (such as management capacity, technicians and other experts, and national subsidies) are still missing. This makes the alignment of international donors with national structures and local water sector programmes difficult
- small municipalities in particular are often unable to cope with handling operation and maintenance of their water systems. There is a lack of administrative and/or managerial capacity as well as financial means and support from authorities at a national or regional level. There has been good experience in other countries with joint boards – that is, associations of local authorities that jointly manage a particular service (such as the unification of water systems, the creation of joint leak detection teams and combined construction teams)
- for sewage treatment, the EU Water Framework Directive approach of river basin management, in which entire river basins rather than single municipalities are considered, would be suitable. This means it is necessary to cooperate with other donors to obtain the necessary funds for interventions at this level
- another possible area of intervention relating to river basin management is support for regional water supply systems and operators, focusing on cooperation between individual water sector operators or joint technical, leak detection and construction teams as suggested above. This would be possible, given donor cooperation, and would take the beneficiaries part of the way towards fulfilling the EU 'acquis communautaire'. ●

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International Conference - Water Efficiency in Urban Areas: Concepts, Technologies, Socio Economics
29-30 January 2009, Wuerzburg, Germany
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Web: www.otti.de/pdf/wea3091.pdf

AWWA Utility Management Conference
17–20 February 2009, New Orleans, USA
Contact: Tricia Loughead
Email: awwamktg@awwa.org
Web: www.awwa.org/conferences/umc

Benchmarking water services: the way forward
12-13 March 2009, Amsterdam, Netherlands
Contact: Conference Secretariat
Tel: +31 725 899 062
Email:info@moorga.com
Web:www.moorga.com

5th World Water Forum
16-22 March 2009, Istanbul, Turkey
Web:www.worldwaterforum5.org

International Conference on Nutrient Recovery from Wastewater Streams
10-13 May 2009, Vancouver, Canada
Contact: Conference Secretariat
Email: mmori@venuewest.com

8th International Symposium on Water Supply Technology
10-12 June 2009, Kobe, Japan
Contact: Conference Secretariat
Tel: +81 663 723 052
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Web:www.intergroup.jp/water/en/index.html

6th Leading-Edge Conference on Water and Wastewater Technologies
23-25 June 2009, Singapore
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2nd International Conference on Water Economics, Statistics & Finance
3-5 July 2009, Alexandroupolis, Greece
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Water Loss 2009
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