

Cooperation in the Dutch water sector: progress of developments in Noord-Holland 2007-2012

ENERGY EFFICIENCY AND ASSET MANAGEMENT



Key drivers in utility and asset management

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WATER SAFETY PLANS



Improving Vietnam's drinking water: success of Water Safety Plan implementation

Regulatory changes announced for England and Wales

Ofwat, the economic regulator for water and sewerage services in England and Wales, has made a number of significant changes to the regulatory system in the run-up to the AMP 14 investment period process.

The first major changes are to companies' licences under Section 13 of the Water Industry Act, which water companies have finally accepted in a significantly-revised form.

The other major changes fall under Ofwat's consultation on setting price limits for 2015 to 2020, in which the regulator has proposed to alter the way the retail element of businesses is financed, customer-company interactions and

accountability, and the management of water sources.

Under the banner of 'regulating for efficiency and growth' proposals include (as set out in the Section 13 changes) maintaining the retail price index (RPI) link for 'wholesale' investments, and focusing on long-term outcomes (for example by working with farmers to avoid pollution entering rivers rather than building an expensive treatment plant).

Suggesting 'a focus on customers', Ofwat proposes to give customers an increased say in how their money is spent and to make companies more accountable for delivering what customers want in the long-term, for example by creating independent

Customer Challenge groups to ensure companies are engaging properly with their customers. This segment will also involve looking more closely at retail services such as billing and call centres, for example by bringing the sector in line with others by breaking the RPI link.

In commitments to 'ensuring sustainable water use' Ofwat plans to encourage efficient water trading – moving water from areas of plenty to those where water scarcity is an issue. Companies will also face penalties for abstracting from sources where environmental damage could be caused, and will be encouraged to take water from sources where no damage will occur. ● LS See Analysis, p5

US Congress warned that predicted infrastructure costs are underestimated

The National League of Cities (NLC) in the US has given evidence to a congressional hearing that warned that the predicted costs for repairing US water infrastructure are an underestimate, and that options for funding upgrades to both clean and wastewater infrastructure are under threat.

Michael Sesma, a council member for Gaithersburg in Maryland, represented the NLC at the hearing. He told the meeting that the cost for repairs runs into 'hundreds of billions of dollars' with federal estimates of potable water upgrades at \$334.8 billion

and wastewater and stormwater upgrades at \$298.1 billion.

He added: 'In our estimation, these investment levels are actually an underestimate given the advancing age of our infrastructure, the burden of unfunded federal regulatory mandates, and factors not yet known as a result of our changing climate.'

He also warned that proposals to end tax-exempt bonds, which financed over \$23 billion worth of water and wastewater infrastructure projects in the first

half of 2012, would create significant problems.

Mr Sesma said: 'If the federal income tax exemption is eliminated or limited, states and local governments will pay more to finance projects, leading to less infrastructure investment, fewer jobs, and greater burdens on citizens who will have to pay higher taxes and fees.'

He also said Congress should not seek to cut the water revolving loan funds and should consider mechanisms that lower the cost of borrowing. ● LS See Analysis, p6

Sydney Water accused of pipe flush failings

Sydney Water has found itself at the centre of a row over pipe flushing, with New South Wales premier Barry O'Farrell issuing a warning about what has been described in the Australian press as 'repeated failure to keep its water pipes free of chemicals during routine maintenance'.

Responding to a newspaper report of complaints of sickness and dizziness from drinking water, Mr O'Farrell claimed the utility had failed to flush pipes before returning them to operation after routine maintenance.

He added that the failure was the result of incompetence on the part of Sydney Water workers 'which should never be repeated'.

'There was a bona fide issue about chemicals being in the water because of disturbance during maintenance activities and that would not have occurred if according to usual practice pipes had been flushed before being put back into operation.'

He added that the chemicals found were within the drinking water guideline levels

and posed no threat to health.

The announcement relates to a health warning that was issued to residents in parts of southern Sydney last December after complaints that the water had a chemical or petrol taste. Sydney Water explained that the contamination was caused by bitumen compounds introduced into a pipe during routine maintenance. The utility has also said there was no threat to the public.

Water samples were found to contain low levels of chloroform and bromochloromethanes, but New South Wales Department of Health said that their presence was 'not unexpected' as they are THMs, which form in the presence of chlorine.

The incident sparked claims that the contamination could be linked to a leak reported the same day from the former ChlorAlkali plant at Botany, which is owned by chemical company Orica, but Mr O'Farrell described as 'nonsense' claims that chemicals could have infiltrated a high-pressure main from the ground. ●

Regulator finds wastewater treatment failures

Colombia's public services regulator Superservicios has announced in a statement that 89 wastewater treatment systems were found to be inoperative during inspections over the past two years.

The regulator inspected 333 systems, 59% of the 562 installed in 480 municipalities, in compliance with the country's National Development Plan 2010 to 2014. During the regulator's technical visits and analysis of the information reported by the utilities, it found breaches of the regulations for sewage disposal, lack of knowledge of operating protocols, lack of infrastructure maintenance and vulnerability to natural phenomena, according to the inspection report.

Superservicios has set out action plans in agreement with the 82 providers responsible for the systems to improve operations, maintenance and optimisation of the systems as well as staff training. ●

Report notes UK water company shareholder returns unlikely to return to previous highs

Tax and advisory services company PwC has issued a report that predicts UK listed water companies' returns for shareholders are unlikely to return to the heights of the mid-2000s, when they routinely reached 20%.

PwC notes that the water companies have consistently delivered shareholder returns in excess of the FTSE All Share Index over the past 17 years, but that this era is unlikely to return because a significant part of the capex growth programme for the sector has been realised, and the market is currently trading in line with fundamental value.

PwC valuations director Thomas Romberg said: 'In the short-term, we expect the market to value UK listed water companies at price earnings ratios in line with their fundamental PE (price/earnings) ratios, something we haven't seen in the last five years. Two key factors are behind this. The first is the ongoing demand from the evolving pool of infrastructure investors for stable, cash generating assets. Secondly, the expectation that regulatory changes currently being proposed will not fundamentally change the risk-return profile for shareholders, as both Ofwat and the Government want to keep private investment in the capital intensive UK water sector.'

Mr Romberg explains that the shareholder returns seen in the mid-2000s were 'surprisingly higher than the market as a whole', which was partly driven by a new breed of owner aiming for financial outperformance, and realising that some companies were under-gear'd 'not from a regulatory perspective but from a market perspective. They saw the potential to introduce more efficient capital structures.'

Even during the financial turmoil that began in 2008 water companies were seen as 'safe havens', but shareholder returns have come down to a level that Mr Romberg notes is one 'which in our experience infrastructure investors would target as a reasonable return'.

The investors – infrastructure funds and sovereign wealth funds – that are now the main water sector owners are looking for long-term stable cash generation, and the opportunity to drive operational expenditure outperformance within a given investment period, Mr Romberg notes.

Investors' longer-term concerns around the water sector were reduced when regulator Ofwat issued its revised proposal on future license modifications in December 2012, removing the uncertainty about how the originally proposed greater flexibility in the license would be used in setting wholesale price limits in the future. This market sentiment is also reflected in the ongoing ownership changes.

'It is still clearly seen by the market as a safe investment,' he comments. 'This was also supported by Ofwat publicly recognising in an announcement that it is important for the sector to remain attractive to investors so that long-term investment can be financed.'

The 2015 price regulatory process has just begun, so significant short-term regulatory uncertainty remains, he notes, but the market appears to take a longer-term view, with recent transactions still at a substantial premium to regulatory capital value.

The current breed of owners are long-term investors, he adds, unlike private equity owners that are seeking quick returns, so stability seems to remain an apt descriptor for the sector. ●

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UK water-only company sold to Japan's Sumitomo Corporation

At the beginning of February, Sutton and East Surrey Water (SESW)'s owner Aqueduct Capital (UK) announced that it had agreed to sell the group to Japan's Sumitomo Corporation for £164.5 million (\$250 million).

The group comprises SESW, a regulated water-only supply company that serves 655,000 customers in the affluent east Surrey, west Sussex, West Kent and South London areas, as well as a number of associated businesses and property interests.

Departing owner Aqueduct is itself owned by infrastructure funds advised by iCON Infrastructure LLP, pension funds managed by Canada's Public Sector Pension Investment Board, and pension, endow-

ment and government funds managed by Canadian investment fund manager Alberta Investment Management Corporation.

Sumitomo, a widely-diversified Japanese corporate giant, said in a statement: 'The global water utilities market is expected to continue growing as a result of population increase and economic growth in developing countries. Privatisation and the role of the private sector more generally are expected to become increasingly important trends in the water utilities market.'

'Sumitomo has a keen interest in developing its principal business in the expanding market for water concessions, and through the acquisition of SESW, Sumitomo will become eligible for further water concession opportunities. Sumitomo

will continue to seek further potential opportunities in water concessions around the world, in addition to its ongoing successes in the BOOT/BOO (build-own-operate-transfer / build-own-operate) based water business in the wastewater treatment desalination sectors in the Americas, Asia, China and the Middle East.'

'Sumitomo has a strategic focus on building and investing in water infrastructure, which makes a contribution to improvements in living standards around the world. Sumitomo intends to continue its strategy of becoming a major player in water infrastructure, utilising its integrated corporate strength to contribute to the provision of stable water supply and solving global water issues.' ●

UNICEF warns that watsan issues are increasing childhood disease burden

Following a nationwide assessment, UNICEF has warned that the severe disruption of water and sanitation services and a lack of access to basic hygiene in Syria have increased the risk of waterborne diseases among children. The assessment, carried out with municipal water departments and local private contractors, identifies the six areas where the ability to access safe water has been most severely restricted as rural Damascus, Idlib, Der Ez-Zor, Homs, Aleppo and al-Raqqa.

EBRD provides water and sanitation funding for Prahova

The European Bank for Reconstruction and Development (EBRD) is providing a loan that

will enable around 170,000 people in Prahova county, south-eastern Romania, to have safe water and sanitation services, and will also greatly reduce the losses that occur in the water treatment process. The Bank is providing an €9.2 million (\$12.1 million) loan to SC Hidroprahova SA, the water and wastewater operator for the Prahova area, to help finance its €146.2 million (\$191.6 million) investment programme.

UN rapporteur calls on Thailand to extend water and sanitation access

The UN special rapporteur on the human right to safe drinking water, Catarina de Albuquerque, has urged Thailand to increase its efforts to ensure all citizens have access to water and sanitation. Following a visit

to the country, she said: 'The contrast between people who have access to water and sanitation in modern and formal zones in cities and those who suffer from the lack of access to these basic services and have been left behind, including informal settlements and hill tribe communities, was striking.'

Study finds water efficiency has wastewater consequences

A study from Victoria University has found that reducing potable water use leads to unintended consequences such as increased sewer odours and faster corrosion of sewer pipes. The CSIRO-funded study discovered that reducing potable water input and replacing it with rainwater and treated greywater created a more

concentrated wastewater. The study found that sewer lifespans were reduced to 40 years for simple water reduction and 77 years for greywater systems.

Commission director announces major infrastructure spend

Antonio Fernández, director of potable water, sanitation studies and projects for Mexico's national water commission Conagua, announced during an infrastructure summit that the commission plans to invest up to P252 billion (\$19.8 billion) in the water sector over the next six years. P89.2 billion (\$6.98 billion) will be spent on replacing existing infrastructure, and P20.8 billion (\$1.62 billion) will be put towards developing new potable water sources.

water utility management INTERNATIONAL

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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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Publishing

Swedish Development Cooperation Agency announces funding for Mediterranean water governance

Sida, the Swedish Development Cooperation Agency, has announced it will provide around 40% of the funding for a key Union for the Mediterranean (UfM) project on water governance in the Mediterranean.

The project, promoted by the Global Water Partnership Mediterranean and the Organisation for Economic Co-operation and Development (OECD), seeks to overcome governance challenges to the mobilization of financing for the Mediterranean water sector. Sida's funding will finance the regional components of the project.

The three year project is about to formally start, and will finish in 2015. The intention

is to find 'realistic' solutions to the institutional and regulatory challenges posed by public-private partnerships in water infrastructure, the capacity-building bottlenecks that impede efficient use and mobilisation of financing, and the mechanisms to overcome them.

The project will develop through a number of national assessments, using tested OECD methodology as well as a policy dialogue approach. The aim is to disseminate a set of guidelines and best practices tailored to the region.

Five countries – Tunisia, Jordan, Lebanon, Albania and Palestine – are

already involved in the first phase of the project, and an additional four countries are expected to be involved over the full three years.

Co-financing for the project will come from the GEF MedPartnership, and a financial agreement with the European Investment Bank is being finalised. Sida's contribution will allow the project to be launched through a regional workshop, which will be organised in Barcelona at the end of the first quarter of 2013.

This will bring together all of the stakeholders involved in issues of governance and financing of the Mediterranean water sector. ●

ANALYSIS

Price control proposals agreed for England and Wales

Rewrites to the economic regulation of water and wastewater utilities in England and Wales have been agreed with companies committing to work with the regulator Ofwat to develop more targeted price controls in the future. Lis Stedman outlines the proposals.

Last October, in a first attempt to revise 2011 proposals, Ofwat, the economic regulator of water and sewerage services in England and Wales, suggested a power to move activities not in excess of 20% of total revenues outside wholesale control in any one price review period, or not more than 40% across multiple control periods.

The majority of the water companies objected strongly to these proposals, on the grounds that there was a lack of detail about how Ofwat would regulate activities that would fall outside the overall wholesale control in future. The companies argued that the potential scope and scale of the changes created a perception of uncertainty that would have made the sectors more risky to invest in.

The agreed revision retains the price cap form of control for the asset-intensive wholesale elements of the business – the water service and sewerage service activities – for five years, with no flexibility in relation to these wholesale controls. The proposals allowed for separate retail controls 'in whatever form is appropriate'.

The changes also commit water companies to work with Ofwat to develop more targeted price controls in future. They do not specify the detail of how Ofwat will regulate retail activities, but will allow some

flexibility to develop retail controls 'in the light of experience'.

Standard & Poor's, which wrote its commentary on the effect to business risk of the Section 13 proposals before Ofwat's significant recent revision, has revised its view of the concerns that the ratings agency felt had been raised.

Standard & Poor's Mark Davidson notes that the concerns 'have gone away to an extent. The worst-case scenario we painted appears to have been averted. The two wholesale price controls will be remunerated entirely on an RPI-X (price cap) / RCV (regulatory capital value) basis. Only the retail remuneration will be under the new framework – on a margin (average cost of sales) basis.'

He notes that Standard & Poor's last assessment, during the period when Ofwat was still proposing to take 20% of total revenues outside wholesale control in any one price review period, and 40% across multiple control periods, was 'alarmist, and rightly so'.

However, he notes that the changes mean 'the downside to business risk is materially reduced, but has not gone completely. There are elements of concern in the new retail proposal, though the consensus in the industry is that it is not

material and we tend to agree.'

Even the limited retail segment could introduce a degree of volatility and uncertainty, he notes – the 'excellent' business risk profile of the water sector is based on an assessment of its business across the whole of the value chain, and removing the retail element reduces that capability.

Although in theory this does not mean the water industry will become a less reliable business, in terms of returns, Mr Davidson notes that the move 'could reduce or compress margins. There could be customer churn. There is risk in the value chain and we can't pretend it isn't there.'

However, he notes: 'But is the water industry going to lose its "excellent" business risk profile and go into the "strong" category, which is what we were worried about originally? Perhaps not. We are much more comfortable that they will remain in the "excellent" category.'

He adds one caveat, about the perennial issue of reset risk, which will next be faced in 2015. He notes that 'if Ofwat was to implement a harsh control in 2015 due to concerns about raising tariffs in an economic downturn, for example, there could be negative implications on ratings even if the wider reforms were ratings neutral.' ●

Focus falls on US infrastructure investment needs

A recent US congressional meeting discussed the government's role in environmental protection, and heard warnings from the National League of Cities (NLC) that far more investment is required to secure water and wastewater services than previously thought. Lis Stedman spoke to NLC's Carolyn Berndt about US regulatory reform.

National League of Cities' (NLC) principal associate for infrastructure and sustainability, Carolyn Berndt, notes that the congressional hearing that recently took place at which NLC warned that previous estimates for the amount of investment needed in water and wastewater assets had been too low, 'primarily focused on the role of the state in protecting the environment, but local government also has a role to play'.

In the US, cities and towns play a far bigger role in water and wastewater provision than is generally the case in Europe, meaning that funding, and future infrastructure needs, are critical issues.

Ms Berndt says that the meeting 'talked about the partnership between federal, state and local government. We protect the environment – everyone needs to work together. Polluted water doesn't have jurisdictional boundaries.'

She cites examples where the US Environmental Protection Agency (EPA) at national (federal) level has helped support this ethos, including a federalism consultation that has resulted in the federal government bringing in state and local governments earlier in the rulemaking process.

'The positive aspect is that the EPA has lowered the threshold of when it consults with state and local government. It used to be so high, at \$100 million, that we were hardly ever consulted. It was lowered to \$25 million in 2008 and as a result we have been consulted more on rulemaking and can have input earlier in the process, with insights and feedback. We thought this was very positive.'

Another example is regulatory reform, something that the Obama administration has started to implement, looking for outdated legislation that can be streamlined or improved. 'It is really about what we can do without requiring Congress to pass a new law, to ease the burden,' she notes. 'We also felt this was very positive.'

She cites the example of the requirement for local government to publish drinking water reports – fairly large documents that

had to be mailed to every customer. 'We said this is very costly and time-consuming, and there is a better way,' Ms Berndt explains. 'Now water utilities can email this out. There is a paper copy available, but even if there is a drinking water violation it can go out electronically.'

She also references the NLC's ongoing concerns about the EPA's integrated planning framework (IPF) for stormwater and wastewater. 'This stemmed from local governments having a lot of concern about a number of unfunded mandates coming down from federal government, and decreasing funds, so no money to pay for more stringent requirements and sometimes a question if there is any benefit. If you have removed 99.9% of something, the last fraction is very costly. Local government is saying is there something better we can be doing?'

In theory, Ms Berndt explains, the framework allows local government to look across the broad spectrum of stormwater and wastewater requirements and see where the best value for money can be obtained, but she observes: 'You still have to meet the requirements. In theory you can space out projects and do those that are most important first.'

However, she notes: 'We have heard there is a disconnect between what the administration is saying and what the EPA will allow governments to do. It also doesn't include drinking water. Some of the larger regional utilities operate across a broad spectrum and are taking a holistic approach to how they manage water and wastewater.'

This means that the NLC believes the IPF should not exclude drinking water, she adds. 'There is still a concern in local government that we can do the most pressing projects but we still have to meet all these mandates in a relatively short time. Twenty years seems long, but it is not when the cost of a CSO is more than the annual budget. There are still ongoing concerns about cost. We are starting an affordability dialogue with the EPA and

other government groups to assess how a community decides what it can afford over a period of time.'

She also warns that 'the whole of the national infrastructure is aging, not just water – roads, and bridges too. There is a huge need for money from a shrinking pot. We called on Congress to continue to be a partner in funding because it creates jobs.'

The majority of the burden of funding infrastructure spending falls on local governments, Ms Berndt notes, despite the huge national implications. This is why funding mechanisms such as the tax-free municipal bonds, which fund 75% of the nation's infrastructure, are vital.

'We're asking for a couple of things,' she says. 'The federal government is trying to cut the deficit and offset spending so it is looking at the tax-exempt municipal bonds. We are saying do not remove them because they are critical to funding.' In addition to more funding for infrastructure programmes, the NLC would like some flexibility in terms of principal forgiveness or negative or zero-interest loans. 'We need to create a new financing mechanism for water infrastructure,' Ms Berndt concludes.

The administration has floated the idea of a general infrastructure bank, but she warns: 'When you line up water against transportation projects, transportation wins.' Another idea is to create a dedicated trust fund for water, or to tax at source products that end up in water – something that manufacturers would undoubtedly pass on to customers.

Another option is a Treasury loan guarantee programme with loans at below market rates – essentially the new WIFIA (Water Infrastructure Financing Innovations Authority) system that is in the final stages of its passage through government.

'The NLC doesn't have a specific position on any of the proposals,' Ms Berndt notes. 'We just call for more money for financing water infrastructure. We are saying all of these would be valuable to local government – they would be tools in the toolbox.' ●

Cooperation in the Dutch water sector: progress of developments in Noord-Holland 2007-2012

The Dutch province of Noord-Holland has been working towards increasing efficiency in the water chain through expanding benchmarking to include municipalities, increasing cooperation and knowledge sharing between the different parties and altering policy to allow for up-scaling and innovation.

SUZAN VAN KRUCHTEN and **LILIAN BERNHARDI** review progress and look at future potential as the province looks to respond to national initiatives.

In 2007, the article ‘Cooperation in the Dutch water sector: developments in Noord-Holland’ was published in the June edition of *Water Utility Management International*. Now it is time to evaluate the current status of cooperation in the water sector in Noord-Holland. What are the latest developments and what does the future look like?

Looking back – national policy

The article in 2007 described the national policy regarding the Dutch water supply chain (producing and supplying drinking water and collecting and treating effluent) as being to improve the effectiveness and transparency of the water supply chain in line with public interest. This national policy was put down in the National Administrative Agreement Water Chain. Cooperation in the water supply chain, organizing operations differently and optimising business processes will not only reduce costs, but also result in an even higher standard of service and a better product. The goal was a year-on-year improvement of between 1% and 2% within and between water companies (that produce and supply drinking water), municipalities (that collect and dispose of effluent via the sewer system) and the public water boards (that treat effluent) over ten years. Five focus points for cooperation were identified in the National Agreement:

- Benchmarking
- Cooperation
- Insight into costs
- Innovation
- Involvement of citizens

In April 2011, the national government, provinces, municipalities, water boards and drinking water companies agreed on measures for efficient water management in the National Administrative Agreement on Water. The National Administrative Agreement Water Chain

forms a basis for the National Administrative Agreement on Water. All stakeholders in the water supply chain recognise that significant efficiency gains are still achievable by improving cooperation between the parties involved.

Developments in the province of Noord-Holland since 2007

In November 2007, the province of Noord-Holland drew up a voluntary administrative agreement. This agreement defined goals, the approach to implement national policy to improve efficiency and reduce costs, and a time frame for further cooperation. In December 2007 this ‘Agreement Cooperation Water Chain Noord-Holland’ was signed by all administrators / directors of the parties involved in the Noord-Holland water supply chain: the association of the province’s municipalities, the three water boards, three water companies and the province of Noord-Holland.

From 2008 to 2011 the processes relating to the agreement were implemented in Noord-Holland. For this, the province of Noord-Holland developed an implementation programme in which the agreements were set as actions for all parties in the water supply chain.

Benchmarking outcomes

Benchmarking, as an instrument for obtaining more insight into the control of costs and performance of municipalities, drinking water companies and water boards, is one of the five main points in the National Administrative Agreement Water Chain, but also in the Agreement Cooperation Water Chain Noord-Holland. In 2007, water boards and drinking water companies were already performing benchmarking, but municipalities did not. That was why the province of Noord-Holland asked the municipalities to participate in the national benchmark on sewage management in 2008 (see Dutch website

www.benchmarkrioleringszorg.nl). As a result, 23 of the (at that time) 61 Noord-Holland municipalities participated in this national benchmarking project.

In May 2009 the province published a report in which the municipalities of Noord-Holland were compared with the national average score. Overall there were few differences, but:

- Noord-Holland municipalities scored higher on the indicators ‘plan realisation’ and ‘good housekeeping’. This means municipalities are able to implement the plans they formulated within the planned time path.
- Expenses for the collection of waste water are higher for the residents of Noord-Holland, because a third of the municipalities write off the investments immediately.

During the process of the benchmarking project, participating municipalities discovered multiple opportunities for learning, optimisation of the water supply chain and strengthening collaboration with one another. Some examples of possible improvements in the water chain and regarding cooperation are:

- Inspection and the use of the inspection results in the planning for maintenance
- Joint assignment of inspection (and / or purification)
- Joint organisation of the process of review
- Exchange of practices and insight (assembling side services or executing projects where sewerage had to be disconnected)
- Exchange of knowledge through monitoring

In 2010 all of the municipalities in Noord-Holland participated in benchmarking executed by the Foundation Rioned, a platform for research and knowledge exchange on sewage and urban water management in the

Netherlands. In this benchmarking project, 430 municipalities were compared in five areas:

- Environmental factors (residents, urbanisation, soil)
- Maintenance and management of the system (inspection, research, workforce)
- Water chain system (length, age, pumping stations)
- Quality and functioning of the system
- Finances

The benchmark report concluded that the Netherlands still has a high reputation for the care taken in managing wastewater and rainwater. The current water supply services strongly contribute to the health and the high life expectancy of the public, safety of supplies and a healthy environment. Nearly all residences are connected to the sewerage system. Most municipalities have finished taking measures to reduce the effect of overflows on surface water quality. Municipalities are on schedule concerning the national and Noord-Holland agreements, but there are still some tasks: the expenses of service provision for municipalities will rise to €1.7 billion (\$2.2 billion) in 2020 (€1.07 billion (\$1.4 billion) in 2009).

Municipalities and water boards have therefore announced their intention to save at least €240 million (\$310.6 million), which will be realised by making well considered investments, utilising technological innovations, combining maintenance in infrastructure and sewerage, and undertaking operational cooperation between municipalities and water boards. Due to climate change, rainfall will increase and force municipalities to take action below- and above ground. Roads can flood, so therefore actions are

being taken such as increasing absorption through the use of public gardens and installing temporary rainwater storage underneath pavements. Adapting to the risks of climate change will require the full attention of municipalities and water boards in this century. The results of the benchmarking are now often used by municipalities to determine their goals in the future.

Cooperation: efficiency in sewerage

Efficiency is nowadays the leading subject in the water supply chain and therefore cooperation is encouraged. The sewerage system is also strongly related to the public space and therefore greater efficiency can also be achieved by combining sewerage and public space when construction and maintenance is needed. Because the majority of costs relate to the installation / replacement and maintenance of sewerage (e.g. costs for paving), increased efficiency can be achieved by combining these actions with other infrastructural processes. In practice, municipalities have not yet fully embraced this idea. For example, only a few sewerage plans (drawn up by municipalities) state the relation between public space (infrastructure) and sewerage projects. Also, the benchmarking did not investigate the possible cost reduction achieved by municipalities when they combine sewerage and public space in an efficient approach.

The aim of the agreements in the water chain is to increase the efficiency and quality of maintenance, and decrease vulnerability. To achieve this, municipalities will have to bundle capacity and knowledge among themselves and in collaboration with the water boards.

With the execution of the operational tasks, maintenance will be made more efficient and there will be economy of scale benefits. Therefore, scaling-up the operational tasks in the water chain to include the working areas of the water boards was proposed, where greater efficiency could be achieved. With this up-scaling, cost savings and an increase in quality can be achieved. Examples of operations where benefits can be gained from up-scaling are inspection and maintenance of assets, monitoring, data administration, operation of pumping stations and customer services.

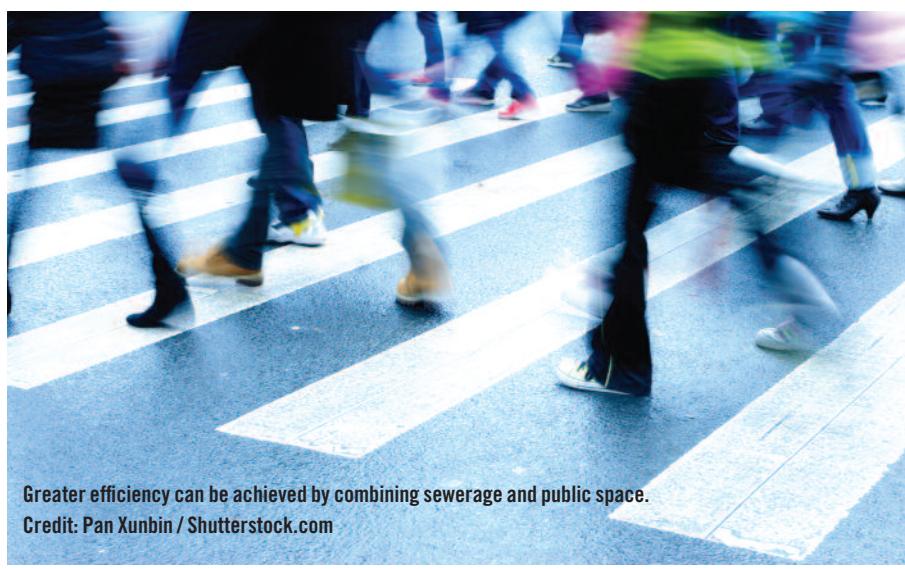
In every water treatment area, the collaborating municipalities and the water board appointed a governmental official and civil servant to take the lead for a regional elaboration. On 31 December 2011, obligatory agreements were established on the legal form of the collaboration in the water chain between municipalities themselves and for the collaboration with the water boards. On 31 December 2012, 75% of these areas will be collaborating on efficiency and effectiveness.

Research into costs

In 2010 the Association of the Dutch municipalities and the Association of the Dutch Water Boards initiated fact-finding research on efficient water management. The most important outcome of this research were the opportunities for cost reduction – for example a cost reduction of up to €380 million (\$492 million) a year in 2020 is possible in the sewage water chain (sewage and purification). For the maintenance and purification of wastewater, the sector could possibly reduce costs by 8% within five to ten years, or €240 million (\$311 million) in 2020. Combining sewerage and purification into one organization will further reduce the costs by 5% of the total costs in the water supply chain, amounting to €140 million (\$181 million) in 2020. Partners in the sewage water chain will make agreements on this at the regional level with the drinking water companies. On the basis of these agreements, the drinking water companies will save €70 million (\$90.6 million) on their yearly costs in 2020.

As mentioned before in the results of the benchmarking, costs can also be saved by combining infrastructure and sewerage construction and maintenance.

The Association of the Dutch municipalities and the Association of



the Dutch Water Boards are stimulating the translation and implementation of fact finding research and results of benchmarking from drinking water companies, municipalities and the water boards. Knowledge and experience from drinking water companies can be used for the optimisation of, for example, asset management, planning, customer relations and operational tasks. Investment programming will also be aligned.

Efficiency can also be increased by clustering knowledge and capacity in investment programming. This does not only include initial costs, but also costs for maintenance to keep assets well maintained.

The investment programming will challenge the sector to find a balance between optimisation in the water chain as well as optimisation of the design of public spaces and sewerage system. Joint investment programmes of municipalities and water boards at the larger scale forms the basis of their plans.

Innovation and intensifying knowledge

Decision making at the local scale on investments and maintenance requires significant insight into the functioning of the system. Therefore, the involvement of experts (knowledge coaches) is needed to make this knowledge applicable at the local scale. The national government co-finances the involvement of these knowledge coaches. Together with the knowledge institutions Rioned, Stowa and KWR a 'knowledge agenda' was developed, which included the information retrieved from the water chain benchmarking. This knowledge agenda forms the basis for the management of the water chain and urban water. This includes the regional dissemination of knowledge for municipalities, water boards and drinking water companies.

Innovation in the water chain

The long-term vision 'connecting water' (set up in the context of the National Administrative Agreement Water Chain) describes how the water chain can become more efficient and sustainable through innovation. Areas include energy recovery from wastewater, the possibilities for reuse of dredge materials and (cleaned) wastewater, reuse of residuals as building material within the water chain, minimising the exposure to trace contaminants such as medicines or hormone disrupting chemicals and the effect of temporary watersheds on the quality of

the environment. These points will be put on the regional agendas, so pilots and space for testing knowledge and innovation can be developed.

Legislation

The current, renewed national legislation stimulates cooperation in the wastewater chain. Through adequate cooperation, municipalities and water boards can profit from the freedom in policy making they have been given under the National Water Law. The basic principle is collaboration based upon agreements and equality instead of specific assignments and permits. This also means that some of the current instruments are no longer necessary, and the role of the province will change in the following ways:

- The municipalities' responsibility for the collection of wastewater will be adjusted, so there is no longer a provincial dispensation necessary when a municipality decides not to collect wastewater in outlying areas, because of efficiency considerations.
- Water boards will no longer be responsible for sewerage connection policy. In addition, municipalities and water boards will formulate their operations in such a way so that both institutions do not obstruct their mutual assignments, to enhance the efficiency of their work.
- In the Dutch House of Representatives a bill is pending to drop the specific monitoring tasks required by the provinces of the municipalities.

In the process of working towards a collaborative and innovative way of working, there will still be some practical obstacles to overcome. Depending on the progress of the National Administrative Agreement Water, possible legislation to remove these obstacles will be prepared and brought into procedure in 2013. If results are achieved in time, the implementation of this legislation will be omitted.

Today's challenges and the future

Thanks to the National Administrative Agreement Water Chain, there has been success in the collaboration between municipalities, water boards and drinking water companies.

Efficiency in the water chain can be considerably increased through optimising maintenance and bringing together knowledge and capacity. A regional approach, a stronger focus on knowledge

and innovation, and improvement of process efficiency are key. More cost effective decisions on investments and a more systematic and efficient execution of operational tasks must lead to these results. The regions have to come forward now to give substance to the agreements in the National Administrative Agreement. Municipalities, water boards and water companies can highlight the possibilities for improvement. On that basis, the process of change can begin. The provinces can stimulate cooperation at the regional level, depending on the regional wishes and specific situation. In any case, Noord-Holland wants to actively stimulate and facilitate these efforts.

It is predicted that the water supply chain will become 10% to 20% more effective in the next ten years if this process is continued and the goals are reached regarding operational efficiency.

Conclusions

National government policy in the Netherlands is focused on making the water supply chain 10% to 20% more effective over the coming ten years. There is wide ranging cooperation in the province of Noord-Holland between different parties in the water supply chain. To fulfil the objectives of central government policy, however, it is necessary to expand and intensify the cooperation, removing some of the current policy instruments and working towards policy making where stakeholders work at an equal level, developing agreements and agendas and integrating processes. The provincial government wants to stimulate and facilitate the process by bringing parties together and giving them an incentive for closer harmonisation. ●



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The evolution of benchmarking in the Flemish drinking water sector

Drinking water services in Flanders, Belgium, have been benchmarked for over a decade and covers finance and efficiency, product quality, service quality and environment and sustainability.

RUDOLF VAN OMMEN and **MARC BUYSSE** highlight key findings from the results received so far and how recent changes to the benchmarking approach may improve analysis in the future.

The Flemish drinking water sector, represented by AquaFlanders, has been involved in benchmarking since 2000. The first benchmarking study pertained to data from 2000 and 2001. The second study was conducted in 2008–2010 and involved data from 2007 (for finance and efficiency) and 2009 (other themes). The finance and efficiency theme was subsequently updated for data from 2010. The successive studies have shown development in scope and content, culminating in a structural approach to regular process benchmarking for which AquaFlanders is currently reviewing tenders.

With benchmarking, the drinking water companies aim to increase transparency for the stakeholders through horizontal comparison between the participating organizations. The companies also use benchmarking to gain better understanding of their individual performance in order to further improve the organization and management of their business processes.

The Flemish water sector

The eight water companies that participated in the 2008–2010 benchmark control the lion's share of drinking water supply in Flanders. Since 2005 they have also been responsible for wastewater management. The integration of water activities poses some limitations to analysis of just the drinking water operations.

The participating companies differ significantly in terms of service area, turnover, deliveries, water sources, 'social customers', personnel, and investment. A meaningful comparative analysis therefore depends on careful interpretation of findings. Some limitation also applies to comparison over time, because not all companies that existed in 2000 remain independent today, and some have been transferred from one parent organization to another.

AquaFlanders selected four themes for benchmarking: finance and efficiency, product quality, service quality, and environment and sustainability. Specific questions and performance indicators that would best serve the purposes of the study were elaborated in a preliminary

review. The indicators ultimately selected are similar to those used in other countries (one of the stated objectives was to follow the VEWIN model of The Netherlands).

Theme 1: Finance and efficiency

The analysis of finance and efficiency compares performance in terms of product price, service price, and process cost. Process cost was analyzed both at company and process level. The latter involved allocation of broad cost categories to production, system input and storage, distribution, quality control, sales, and general activities.

General financial-economic characteristics

This theme shows the great diversity among participating companies. Average turnover in 2010 was over €80 million (\$107 million), but this ranges from less than €10 million (\$13.4 million) to around €215 million (\$287 million). The average annual turnover has increased some 34% since 2000, in large part due to the almost 30% rise in water tariffs during this period.

The differences in turnover reflect great variation in water deliveries to customers. However, this relationship is not entirely one to one, because while most companies predominantly serve residential customers at retail tariffs, there are also bulk supplies to large industrial clients and other water companies for which different rates apply.

To enable comparative analysis of companies of such varied makeup, the data have been related to a common reference value. Consecutive benchmarking studies have shown that selection of the reference value greatly affects the ability to interpret the findings. Since the benchmark involves water supply to residential households, the residential unit would be the most appropriate reference value. However, in some service areas not all residential units are metered and their number is therefore not known. Using

Figure 1: Benchmark themes

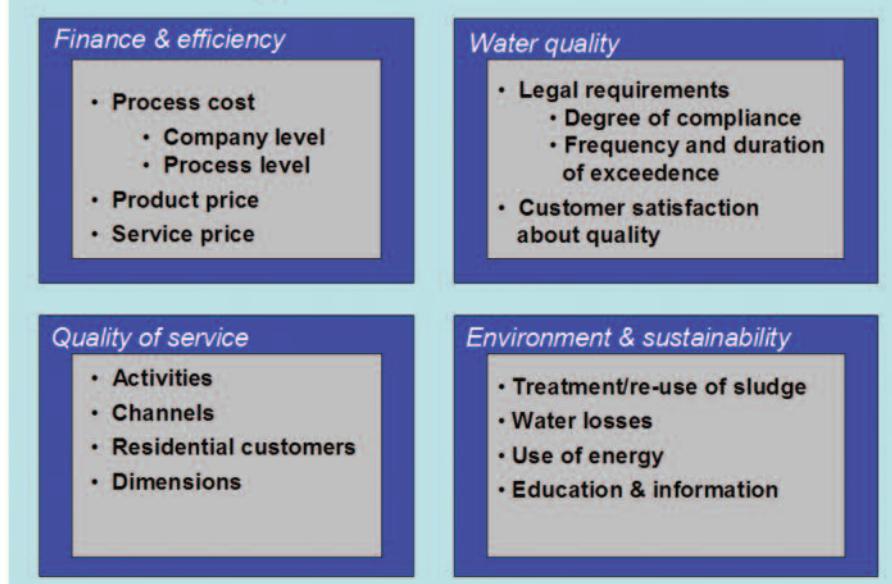
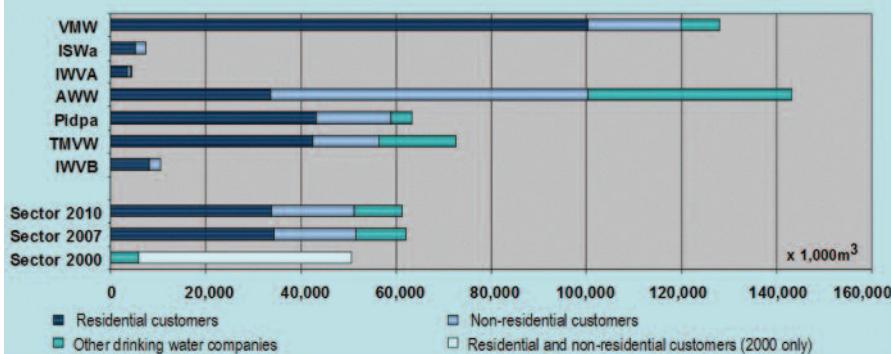


Figure 2: Deliveries to (non-) residential customers and drinking water companies

the number of service accounts as a proxy was not deemed suitable either, since one account may cover more than one residence. The earlier benchmarks therefore employed the branch connection as a reference value, as the distribution point closest to the customer on which companies have complete information. However, this too distorted the findings. Only in the 2010 update of the F&E theme were all companies able to supply reliable estimates of the number of residential units being served. This has vastly improved the analysis and presentation of findings, but makes comparison with the earlier studies more difficult.

Investment

While the benchmark in 2008–2010 showed a marked decline in total investment from 2005 to 2007, the recent F&E update shows the level of investment increasing steadily from 2008 to 2010. In fact, the initial decline was less dramatic than it seemed, since the purchase of storage basins by one company led to an exceptionally high level of total investment in 2005. Further analysis shows that total investment in input and storage and in distribution has markedly increased since 2007. In fact, the great majority of investment concerns the distribution system.

Price of water

The benchmarking analysis involved a number of different tariff classes, ranging from residential 50m³/year to non-residential 25,000m³/year. In all classes, there was significant variation among the companies. The tariff class most relevant for residential water supply is 130m³/year. This involves a household of three persons collectively using 130m³/year of which the first 45m³ are supplied free of charge. The arithmetic mean tariff in this class for all Flanders was €1.50 (\$2)/m³ in 2010, with a minimum of €1.27 (\$1.69)/m³ and a maximum of €1.83 (\$2.44)/m³. Weighted for volume of water delivered, the average tariff was €1.48 (\$1.97)/m³.

Cost

The total cost of doing business comprises financing cost, depreciation, operating cost (levies, personnel, third party services, water purchase, other cost, and recuperated cost), extraordinary cost, and taxes. These costs were analyzed at company level by residential unit and by m³ water delivered to customers. The total cost by residential unit only showed a marginal increase from 2007 to 2010, with the distribution over the different cost categories remaining fairly constant. However, there was a 10% increase in total cost by m³ delivered.

The main components of total cost are operating cost (75%) and depreciation (13%). These have been further analyzed for each of the main processes: production, input and storage, distribution, quality control, sales, and general cost.

In most companies, approximately half of the production cost represents levies and depreciation, and the other half personnel and third party services. The latter categories are the more promising for efficiency improvement. Production cost/m³ rose by about 10% since 2007. In-company production nevertheless remains much cheaper than procuring drinking water from other companies.

The cost of input and storage very much depends on location and nature of operations. In a number of participating companies it was not possible to retrieve the cost for this activity, since this is subsumed under other chapters of the budget (e.g. part of production cost). Consequently, the findings pertain to only three companies and as such are not very representative for the sector.

Distribution is a process that also generates income (e.g. rental charges for mobile telephone antennae on water towers). Taking this and other income into account, the net distribution cost per m³ input into the distribution system has remained almost constant since 2007 at approximately €0.40 (\$0.53)/m³.

The differences found in cost levels for quality control depend on whether the

companies produce their own water or purchase it from somewhere else (in which case quality control is the responsibility of the seller). The cost of quality control mainly comprises personnel and third party services, and would thus offer potential for efficiency improvement. However, since quality control represents only a small part of total operating cost the potential efficiency savings at company level would be small. Sales is another process in which water companies generate non-tariff income, mainly through compensations received for executing total water services billing (i.e. including non-drinking water related activities). The net sales cost increased approx. 10% since 2007 and mainly comprises personnel and third party services cost. As for quality control, this points to possibilities for efficiency improvement, but with limited savings at company level.

Theme 2: Product quality

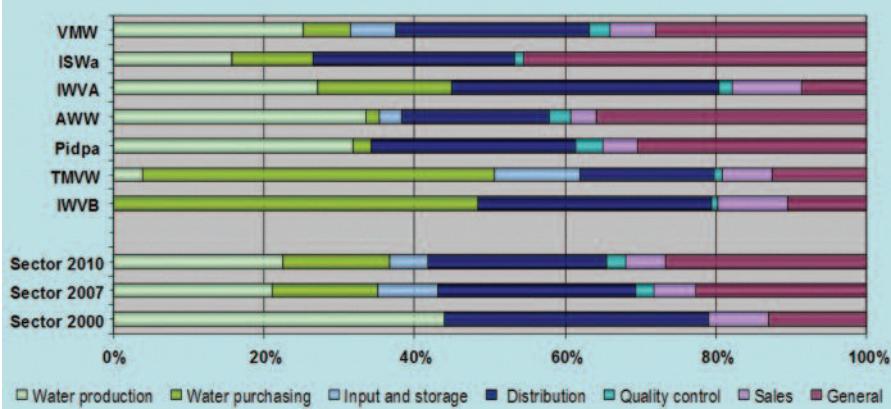
The analysis of product quality was based on data from a report on tap water quality by the VMM (Flemish Environment Agency). The benchmarking study expanded on this by ranking delivery areas (a geographical area in which water used for human consumption derives from one or more sources deemed of almost uniform quality) in terms of values observed for chemical and biological parameters.

The delivery areas were ranked on mean and maximum values of all parameters, based on the parameter with the highest value relative to the norm. In three areas the median values of all parameters scored less than 25% of the norm, and there were two areas where the worst parameter exceeded the norm. All other areas scored within the norms for all parameters. For the maximum values of all parameters, there were no areas scoring less than 25% and 29 where the value was more than 100%. In only four areas where a maximum parameter value exceeded 100% of the norm did this involve a macro biological or chemical parameter.

Data on total hardness (French degrees) and turbidity (NTU) was compared with findings from the customer satisfaction survey regarding the perception of hardness, clarity, and taste of the water. Customers find the hardness of water less satisfactory in areas where water hardness is high.

There is no relationship between measured turbidity and customer

Figure 3: Depreciation and operating cost by main process
Weighted for volumes delivered



perception of clarity. This is most likely due to the fact that even the highest measurements are so low that they cannot be perceived by the naked eye. However, the overall high score (across the range of measured NTU) indicates a high level of satisfaction with clarity.

An interesting finding was that customers are more satisfied with the taste of water in areas where total hardness is low than where it is high. Further investigation should determine whether this is a coincidence or a real difference in perception.

Theme 3: Service quality

Service quality is related to the performance in activities such as billing, handling of service interruptions, metering, etc. A survey of perceived service quality addressed various modes of customer contact (personal service at a window, regular mail, internet / email, and telephone) and covered the responsiveness, reliability, care taken, and empathy. Apart from perception, the comparative analysis also covered objective service delivery efforts such as the number of client contact points, telephone lines, and

technical service units.

The overall satisfaction with service delivery is high, with all companies scoring around 8.0 on a scale of 1 to 10.

Most companies maintain physical contact points and telephone numbers for customer contacts, but sector-wide there has been a decline in physical contact points (service desks and windows) and telephone numbers since 2001 (smaller companies often were an exception to this).

Most customers still use the telephone to contact their drinking water company. Specifically for metering the respondents showed no preference for any single mode of contact to submit their readings in the future. Customers seldom visit the water companies' websites, but those who do are generally satisfied.

The service area per emergency service point has declined, as has the service area per emergency service employee. This suggests an increase in emergency service personnel since 2001. It is not clear whether there is a causal relationship between this and the decline reported in service interruptions.

Regarding rational water use, the

survey included residential use of different sources for general and drinking purposes, and the degree to which households practice water conservation measures.

There has been a strong increase in the use of tap water for drinking water, with a corresponding decline in the use of bottled water since 2001. The use of filters on residential water taps has remained fairly constant.

Since 2001 there has been a marked rise in the use of alternative sources besides tap water, mainly for watering gardens and washing cars. Apart from this, more and more customers have begun using water conservation methods since 2001.

Theme 4: Environment and sustainability

This theme involves both internal efforts – aimed at improving efficiency and mitigating the environmental impact of the water production process – and externally oriented initiatives to demonstrate corporate social responsibility. The latter category includes education and information activities and international development cooperation.

Non-registered use in production, input and storage, and distribution has been calculated based on volume abstracted, input treatment, volume produced, input distribution, and volume sold.

Production losses remain low, averaging 2.7% in 2001 and approximately 2.5% in 2010. The average loss in distribution is a little over 15% in a limited range between 10% and 20%. The benchmark did not collect data to identify the differentiation in these losses. Because only one company measured losses in input and storage, there are no sector-relevant findings for this process.

The companies' environmental footprints were compared using data on discharge to surface water, sludge treatment and reuse, and use of energy.

Most companies record very little discharge to surface water, with the exception of one company that discharges cooling water. Relative to input into the treatment process, all companies score close to the average.

Sludge production averages 23.4% of input into the treatment process, with a range from 0.1% to 60.3%. Where sludge production is high this seems related to the composition of the groundwater used for production by the related company. This company reports that 70–80% of this sludge is reused.

Energy use averages around 0.32 kWh/m³, with a range from 0.06

Figure 4: Distribution of delivery areas by highest median value

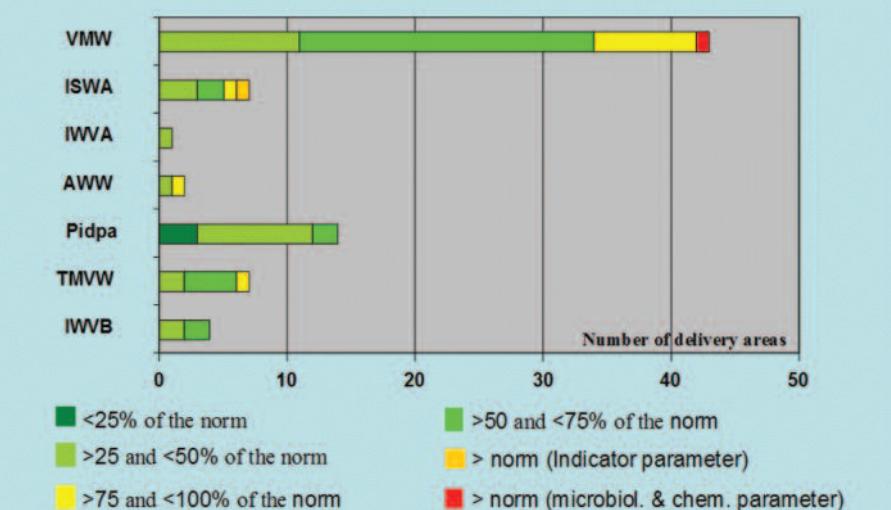
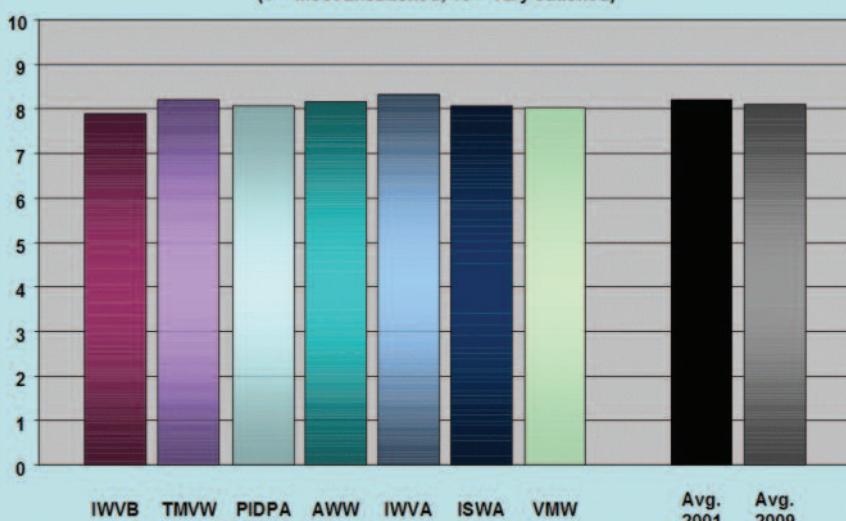


Figure 5: General customer satisfaction

(1 = most unsatisfied; 10 = very satisfied)



kWh/m³ to 1.05kWh/m³. The high end of this range was due to the fact that one company uses treated wastewater as a source for drinking water production, which necessitates multiple steps in its treatment process.

All companies have some activities in the social responsibility category, but the nature and volume varies significantly. In financial terms, the expenditures average €0.47 (\$0.63) per customer, with a range from €0.03 to €2.81 (\$0.04–3.75), for education and information, and an average of €0.04 (\$0.05), with a range of €0.01 and €0.37 (\$0.01–0.49) per customer, for international development cooperation.

The future of benchmarking in Flanders
Benchmarking of drinking water services in Flanders began as an initiative by the water companies, and has become more transparent since 2000. The first benchmark report was not made publically available, but the 2007 benchmark was. Moreover, all participating companies have now agreed to show individual results together with the sector results.

However, the many qualifying statements accompanying the findings in the benchmarking reports point to an important limitation of the type of traditional benchmarking in the Flemish drinking water sector to date: direct comparison of quantitative data can easily lead to erroneous conclusions. This could put the relevance of the data into question, as companies operate in sometimes widely varying circumstances.

One way to deal with this is to take a bottom-up approach to benchmarking by looking at the contribution of the performance in specific processes to the overall wellbeing of the company, irrespective of exogenous factors. In other words, given the external circumstances, how well does process execution compare with the same process in other companies?

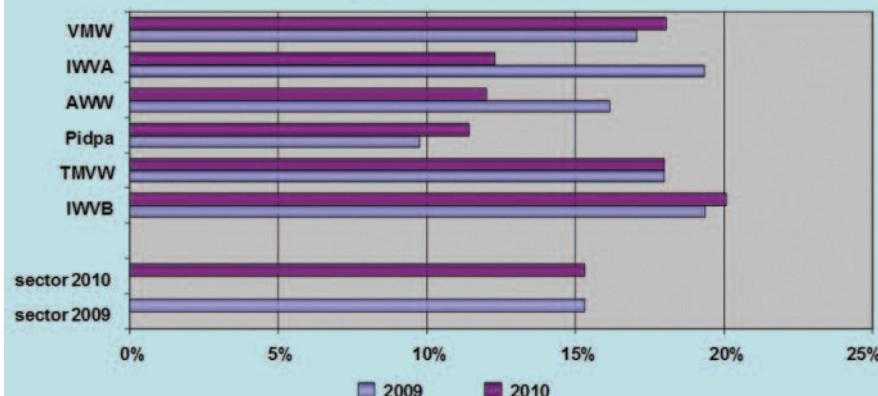
Although this would present a significant improvement, there will nevertheless still be a need for more top-down, metric benchmarking to assess the companies' relative overall performance. After all, even a combination of the most efficient processes does not eliminate the impact

of environmental factors, and it is important to fully explain the nature and extent of this impact.

In 2010, the Flemish Government established a water regulator with a mission to conduct benchmarking of operational and financial efficiency; report to government on relevant issues; and advise on draft legislation for the drinking water sector. The water regulator seeks to stimulate the water companies to enhance their processes; to promote knowledge development on production and distribution processes; and to create transparency for all stakeholders through public reporting.

The water regulator has decided that future benchmarking should also include the bottom-up analysis described above. Ultimately, the intention is to combine this with more top-down benchmarking using (combinations of) quantitative indicators (metric benchmarking).

While the water companies remain responsible for implementation, the water regulator now has overall responsibility, providing guidance and support if needed. With a two-pronged approach, involving annual completion by all companies of the regulator's drinking water dataset and one annual process benchmark, benchmarking will become more structured and more regular. The water regulator furthermore aims to anchor the use of benchmarking in drinking water management by requiring all companies to submit performance improvement plans and report regularly on their implementation. ●

Figure 6: Non-registered water in distribution

Rudolf van Ommen



Marc Buysse

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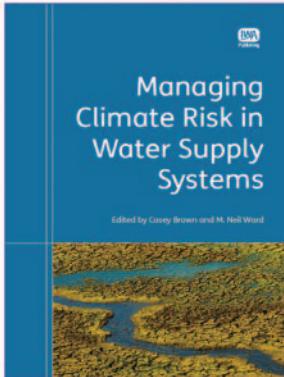
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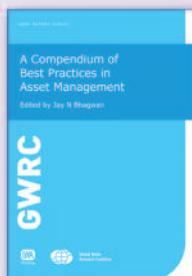
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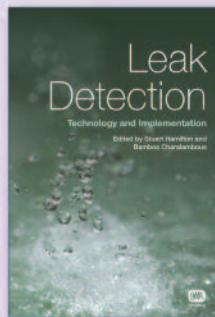
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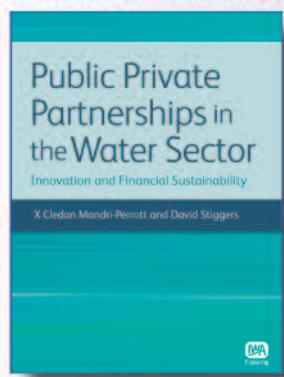
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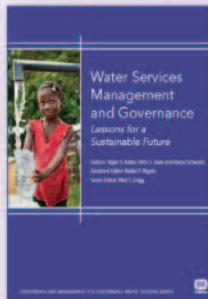
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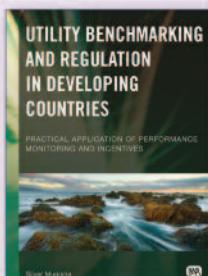
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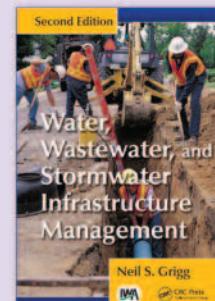
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Achieving economic efficiency of wastewater: a survey of international best practice

Observers have long noted that tariffs for water services are often not high enough to cover the costs of the network and offer a high level of service to customers, but this is also true for wastewater services. **GEORGE ANSTEY** discusses the results of a survey undertaken of five well-developed regimes from the UK, Australia, US and Brazil which found examples of good practice, but even at this level there are issues around recovering full costs of wastewater infrastructure.

Pricing in the water industry is a politically sensitive issue in many countries. As an industry often remaining in government hands and one with an important public health role, setting tariffs for water prices is often a compromise between a variety of social objectives. These social objectives can include ‘fairness’, transparency and potential conflicts with government environmental and social policy. In practice, satisfying these various objectives has come at the cost of adopting water pricing which reflects the cost structure of supplying water services.

Setting prices for all water services in a manner that reflects the utilities' costs is a key management issue for increasing efficiency in the sector. Without cost-reflective tariffs, water utilities may run into financial difficulty or suffer from a shortage of capacity and have to ration services between users.

In recent years, rising water scarcity has brought the problem into starker relief in the water sector. The water utilities of the fastest growing countries are subject to particular pressure, where subsidies are ballooning to keep pace with rapidly urbanising populations in China and the water-scarce Middle East. For example, in the fast-growing United Arab Emirates of Abu Dhabi alone, combined water and wastewater subsidies will almost double from AED 5.7 billion (\$1.6 billion) to AED 10 billion (around \$2.7 billion) between 2008 and 2015. On the back of rising pressure on the water and wastewater systems, many utilities in emerging markets recognise that the future lies not just in meeting water demand, but using effective pricing to manage it.

Whilst growing pressures on the water

system are concentrating minds on the need for cost-reflective pricing for water, wastewater tariffs have often remained the poor relation. Even in many developed jurisdictions, wastewater tariffs have historically been unmetered and / or based on some measure of property value and that legacy continues to the present day. Nonetheless, cost reflective wastewater pricing is important for the financial viability of water utilities and for efficient consumption of both water and wastewater services.

This article explains why tariffs reflecting costs are important for increasing efficiency and provide a snapshot of the state of best regulatory practice. The survey covers five international jurisdictions:

- England and Wales
- Perth, Western Australia
- Melbourne, New South Wales, Australia
- Los Angeles, USA
- Sao Paulo, Brazil

The survey shows that even well-developed jurisdictions have a long way to go before pricing will fully reflect the underlying structure of costs of providing wastewater services.

Prices that reflect costs enhance economic efficiency

Economic theory uses the term ‘economic efficiency’ to describe the allocation of resources which maximises the production of goods and services for society as a whole. The overarching lesson from the economics literature is that in order to enhance efficiency (and increase social welfare), prices in every sector of the economy should reflect the underlying structure of costs.

In principle, there are three important categories of costs that tariffs in the

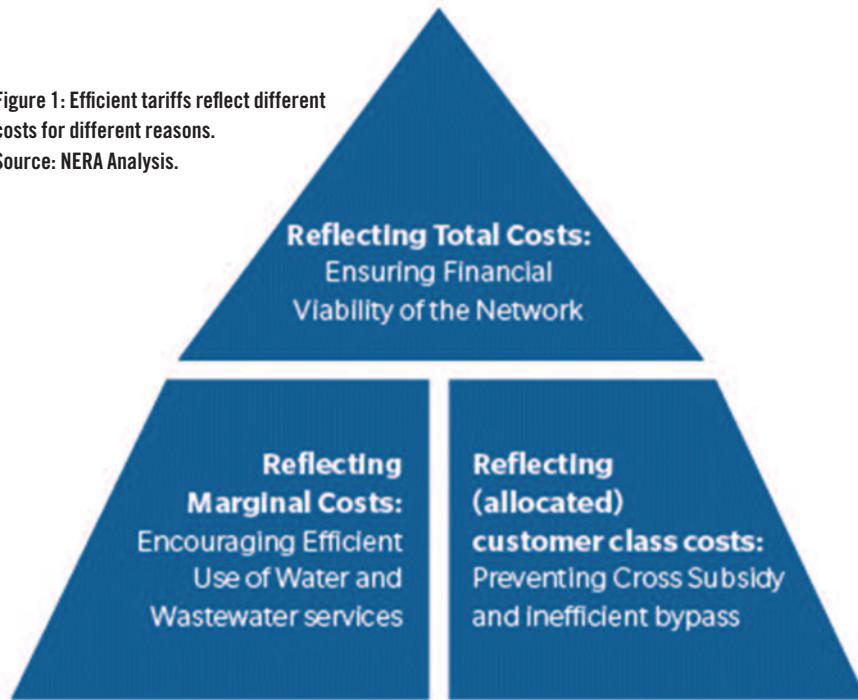
wastewater sector should seek to reflect to enhance economic efficiency, for a mix of theoretical and pragmatic reasons: total costs, marginal costs and the costs of a customer class. Wastewater tariffs should reflect these costs for a variety of reasons (see Figure 1):

- Tariffs that do not reflect total costs (including depreciation, opex (operational expenditure) and return) may cause water utilities to run into financial difficulty, call on government funds, or hinder private sector involvement, which could otherwise increase the efficiency of the sector.
- Tariffs that do not reflect marginal costs mean that users will not make efficient use of water services. The absence of marginal cost signals in pricing results in over or under-provision in the service from a social perspective.
- Tariffs that do not reflect the costs of a customer class result in ‘cross-subsidies’ from other users that can either prevent efficient competition or encourage inefficient entry in the sector.

Reflecting total and marginal costs and the costs of a customer class in final tariffs will tend to increase efficiency in the use of the wastewater network. In general, it is not possible to reflect all of these costs perfectly or simultaneously and all tariffs regimes are a compromise between reflecting these different categories of costs. The balance between reflecting these different cost categories depends on the priorities of the utility and the regulator. A survey of five well-developed regimes illustrates that tariffs remain relatively unsophisticated and focus on total cost recovery, albeit that there are some moves to sharpen the marginal signals offered by prices.

Figure 1: Efficient tariffs reflect different costs for different reasons.

Source: NERA Analysis.



Sophisticated regimes recover total costs

The starting point for cost-reflectivity for many regulatory regimes is that total revenues from wastewater tariffs reflect the total costs of the service – a principle also widely known as the ‘user pays principle’, ‘full cost recovery’ or FCR. Total costs include depreciation of the assets that make up the wastewater network, operating expenditure, tax and return on past investments.

Part of the reason for setting tariffs that cover total costs is pragmatism; tariffs ensuring full cost recovery remove the need for government subsidy and ensure the financeability of wastewater utilities. In the current backdrop of rising costs in the water sector and as economic conditions place pressure on government funds, ending government subsidy can seem particularly attractive to policymakers.

In principle, tariffs which reflect total costs need not increase economic efficiency in the short-term. For example, if the cost of providing additional wastewater services is negligible because the costs of the necessary infrastructure have already been sunk, it might be efficient in the short run to charge a price for water services that does not recover total costs. However, over the longer-term, designing tariffs which reflect total costs will tend to increase efficiency where:

- Such tariffs encourage private sector investment in the provision of wastewater services by establishing a precedent that costs will be recovered
- The alternative is no charge for water services, which can encourage overuse

of existing assets over time (to provide incentives for cost-efficiency, some regulatory incentive mechanisms did not guarantee full cost pass through, which may also allow regulators over time to deny full cost recovery). Of these four regimes, only Perth allowed any kind of subsidy from the (state-owned) water company to cover the costs of serving particular customer types. Los Angeles was the only significant exception to ensuring FCR and provides a cautionary tale.

When the Bureau of Sanitation in Los Angeles first introduced tariffs for wastewater in 1972, the municipal authorities made no allowance for the sunk costs of investing in existing infrastructure. Early tariffs only covered a small portion of the wastewater network’s costs. Even today, tariffs cover the Pay-As-You-Go costs of the system and do not reflect either investments undertaken before 1972 or any investments undertaken with government funds since then. Given the long life of assets in the wastewater industry, current tariffs may still be significantly lower as a result of omitting these cost categories.

The low level of tariffs has caused a number of problems for the wastewater utility. The city’s ‘Clean Water Programme’ (CWP) was not financially independent until 1987. Even since then, the CWP has had to repeatedly call on government funds to reduce sewer spills and comply with environmental legislation, including a \$1.6 billion subsidy during the 1990s.

of the network and shortages or rationing of services

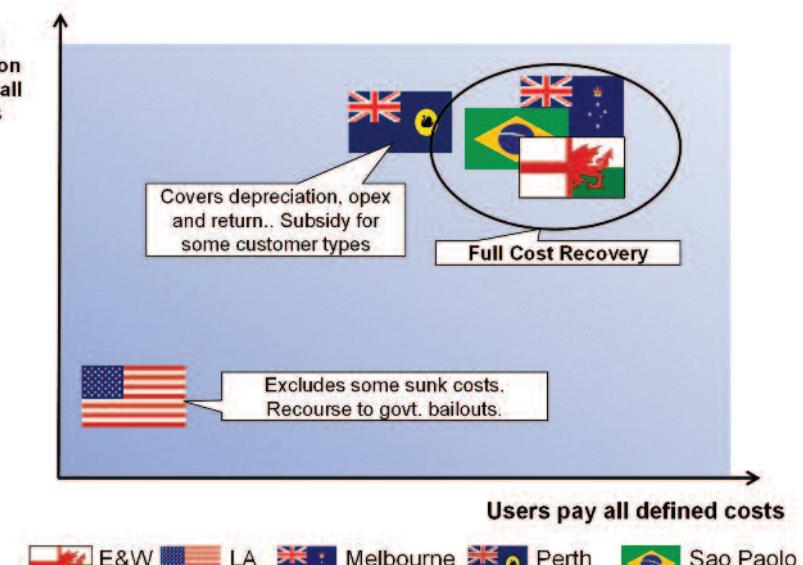
- Simple charges are a first step along the road toward adopting more efficient pricing signals

FCR requires, first, a complete definition of costs (including depreciation, opex, tax and return), and second, a contract or regulator that allows those defined costs to be recovered in practice. Most regulatory regimes in developed countries ensure FCR, a fact reflected in the five regimes surveyed (see Figure 2).

Of the five regimes reviewed, four had reasonable rules for updating the asset base and depreciating the value

Figure 2: Even in OECD countries, tariffs do not always ensure full cost recovery.

Source: NERA Research and Analysis.



Jurisdiction	LRMC modelling	Fixed and variable costs	Fixed and variable tariffs	Volumetric rate	Varies by strength (industrial)
	E&W	No	For Metered users	For Metered users	BOD & SS
	LA	No	Industrial only	Industrial only	BOD & SS
	Melbourne	Wholesale level	Varies	Yes	BOD & SS & others
	Perth	Industrial strength only	Industrial only	Industrial only	BOD & SS & others
	Sao Paolo	No	No	No	Customer class

Table 1: In practice, most regimes do not estimate marginal costs but do seek to signal costs to end users.

Source: NERA Research and Analysis. BOD = biochemical oxygen demand. SS= suspended solids. 'Other' = other factors such as metals and nitrates. Red = not at all. Amber = to some extent. Green = widespread.

Sophisticated regimes employ some marginal cost signals

Marginal costs are the costs of producing an additional unit of output. Economic theory suggests that customers will make economically efficient choices about their consumption levels when the marginal price is equal to the marginal cost of provision. In the case of wastewater tariffs, that would usually equate to the unit rate on tariffs being equal to the marginal cost. If the unit rate on tariffs is below the marginal cost of provision, customers will tend to over-consume wastewater services, putting an excessive financial burden on the utility.

Evidence on the demand for water services shows that marginal prices have material impacts on consumption and economic efficiency in practice. The importance of adopting tariffs that reflect marginal costs is further reinforced when one considers the knock-on impacts in the water sector. The consumption of water and wastewater services is a joint decision whenever a consumer discharges water it has consumed to the sewer. As a result, ensuring that wastewater charges reflect marginal costs is important not just for efficient consumption of wastewater services, but also for efficient water use.

In the short run, the marginal costs of a wastewater utility are likely to be low and involve principally additional pumping and treatment. Setting charges equal to marginal costs in the short run is likely to result in very low charges whilst there is spare capacity on the network. On the other hand, when capacity is scarce, the short run marginal cost of coping with additional sewage would be very high,

including the additional costs of new infrastructure. As a result, charges based on short run marginal costs are likely to be volatile over time, which can cause problems for financeability and the acceptability of tariffs. Instead, utilities and regulators may prefer to set tariffs which reflect the Long Run Marginal Costs (LRMC) in their tariffs. LRMC covers the costs of collecting, treating and disposing of effluent over the long-term (usually 20-plus years), including the costs of future infrastructure necessary to meet an additional unit of load.

In practice, signalling marginal costs through marginal prices is not widespread, even in OECD (Organisation for Economic Co-operation and Development) countries. However, many regimes provide at least some incentives for customers to make efficient use of the wastewater network by employing charges which vary by volume and strength, for at least some customer classes (as demonstrated in Table 1 for the four countries surveyed).

The most sophisticated regimes surveyed were in Perth and Melbourne where the regulators make use of LRMC (long run marginal cost) modelling as the basis for marginal prices. Melbourne Water uses LRMC modelling only at the wholesale level, and in Perth only industrial customers pay charges based on the LRMC of their discharge.

Four of the regimes estimated fixed and variable costs separately and then allocated them separately to different charges for at least some users. Whether separate calculation of fixed and variable costs and charges is more efficient than other

methods is an empirical question. At the very least, separating fixed and variable costs and charges reflects the structure of the underlying costs of the utility.

In all five well-developed regimes surveyed at least some customers pay volumetric charges, including all customers in Los Angeles, Sao Paolo and Melbourne. However, 60% of domestic customers in England and Wales and the entire group of domestic customers in Perth pay completely fixed annual wastewater charges.

Four of the wastewater companies charge industrial customers according to strength-reflecting formulae. The formulae base annual charges on the average unit cost of treating waste discharged by the industrial customer according to at least two strength factors (biochemical oxygen demand (BOD) and suspended solids (SS)). In Sao Paolo, the level of the tariff is higher for industrial customers, although it is not clear whether those tariffs reflect pragmatic considerations or the higher costs associated with industrial strength waste.

Regulators make some attempt to allocate costs according to which groups impose them

Segmenting tariffs so that different groups of customers pay different tariffs is an important mechanism for ensuring that customers make efficient use of the network. Where utilities do not reflect the costs of customer groups accurately in tariffs, customers with alternative options may go 'off system' and treat their own waste as a way of avoiding tariffs.

The accepted definition is that a customer class is receiving cross-subsidy, if it does not cover its incremental costs (or net avoidable costs). The problem for policymakers is that this criterion does not provide a unique allocation of the costs of the network in the presence of economies of scale. After charging customer classes their net avoidable costs, the utility must allocate a residual cost between customers in order to achieve full cost recovery. The process of allocating costs to customer classes establishes a cap and floor:

- Each customer class should pay at least its net avoidable cost, so that each customer group pays for its collective burden on the network
- Utilities should keep tariffs below the standalone cost for that customer class, to ensure that customers do not inefficiently bypass the system

	Used	Not used	Unknown		
Estimate Separate Costs of Billing or I&C	 				
Volume Drivers	 	 	 		
Strength Drivers	 	 			
Geography	 	 			
	 E&W	 LA	 Melbourne	 Perth	 Sao Paolo

Table 2: Some regulators separate fixed and variable costs, others allocate costs using volume, strength and geography. Source: NERA Analysis and Research. Notes: * In Perth, the regulator has argued that there may be cross subsidy because revenues do not reflect volumes. Tariffs for industrial customers take account of wastewater strength ** In England and Wales and in Melbourne prices do not vary geographically within wastewater retail companies' regions. I&C = Industrial and Commercial customers.

Allocating costs between customer classes using avoidable cost principles means that some customers will pay less for wastewater services than others. However, every group of customers will pay less overall than they would do if they had to go it alone, and each customer class contributes to the joint fixed costs of the network.

In practice, all five regimes we reviewed had policy statements prohibiting cross-subsidy but none had established rules defining minimum and maximum proportions of costs that each customer class should bear. The tariff-setting procedures in all five jurisdictions lack explicit definitions for net avoidable or incremental costs and firm legal definitions of those costs. Neither do the tariff-setting procedures explicitly define tariffs for customers by seeking to minimise inefficient bypass or overuse of the wastewater infrastructure.

Regulators do take some practical steps to allocate costs among customer classes by: identifying the additional costs from serving a particular customer group; ensuring these are recovered in full from the respective customer class; then dividing left-over costs by transparent criteria. Various methods are used to allocate costs among classes.

- In Los Angeles, Perth and England and Wales, industrial users and subcategories of industrial users pay separate charges to cover the fixed costs of inspection, control and monitoring of the industrial waste permitting

programme.

- In Los Angeles, England and Wales, Melbourne and Perth the tariff regime allocates costs among customer classes on the basis of the volume and strength of waste produced by that customer class.
- In England and Wales and Melbourne, customers pay different charges if they are served by the different retail companies, which are located in different geographies. In Sao Paolo, SABESP charges customers in different locations different charges based on the costs of serving different jurisdictions.

Concluding thoughts

Introducing more cost-reflective pricing of wastewater services in developing and emerging economies could substantially increase economic efficiency. The benefits are arguably the greatest in fast-developing countries where the ability of tariffs to influence decision making is greater. For example, by setting higher (or lower) prices, utilities may be able to influence industrial customers' location decisions and the technologies that they install for wastewater treatment at the outset of operations.

Growing water scarcity due to climate change, rapid population growth and industrialisation in many emerging markets is focusing minds on the problem of water pricing. Wastewater pricing, long the poor relation, has remained less affected by the growing trend towards efficient pricing. As a result, there are few

regimes that exemplify cost-reflective wastewater pricing for utilities in developing and emerging economies.

There are some key examples of cost-reflective pricing that rapidly growing economies with urbanising populations could follow. Most of the well-developed regimes we reviewed allowed utilities to recover their full costs from tariffs. Some regimes have introduced tariffs based on LRMC, although they still only apply at the bulk supply level. Regulators do recognise the need to discourage cross-subsidy and utilities make some effort to allocate costs to the customer groups that drive them, even in the absence of firm legal cost definitions which prevent cross-subsidy. The most cost-reflective prices ensure full cost recovery, whilst providing users with signals to use the wastewater infrastructure efficiently.

The overall picture is that there is a long way to go before waste water tariffs reflect the underlying costs necessary to promote economic efficiency, even in well-developed regimes. ●

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Key drivers in utility and asset management

Two upcoming IWA conferences to be held in April will be focusing on the economics of energy efficiency and asset management in utilities. **LIS STEDMAN** spoke to two members of the organising committee, **CARLES SANCLEMENTE** and **HELENA ALEGRE**, on what is driving progress in utilities.

IWA's Specialist Group of Statistics and Economics is organising two interesting and complementary parallel conferences from 24 to 26 April in Marbella, Spain, which aim to shed light on the economic aspects of energy efficiency and asset management, as practised in utilities around the world.

The first of these conferences is the 3rd International Conference on Water Economics, Statistics and Finance and the second is titled Asset Management for Enhancing Energy Efficiency in Water and Wastewater Systems. The chair of the organising committee, Carles Sanclemente, who is also vice-chair of the IWA Specialist Group, explains: 'By running the two conferences in parallel it is possible to reduce the organisational costs, and there are also a lot of synergies between the two events.'

Fellow organising committee member Dr Helena Alegré adds: 'Energy efficiency is one of the key drivers for strategic asset management of urban water infrastructures. Rehabilitation interventions of existing systems are either motivated by

or excellent opportunities to enhance this. However, energy efficiency and asset management are often dealt with as if they were independent processes within the organisations.'

'Good asset management is often seen as a process that leads to the identification of what and when to rehabilitate the existing assets, implicitly assuming a like-for-like replacement approach,' she says. 'Little attention is often paid to global rationalisation of the existing systems and to the transition path to improve their performance.'

'On the other hand, efforts to improve energy efficiency and environmental sustainability of urban water systems tend to be limited to better management of the pumping equipment – design, operations, and maintenance – use of "green energy" and production of energy, for example biogas at wastewater treatment plants. The system approach that can be offered by strategic asset management techniques is often missing.'

'This conference aims to help with bridging the two areas, demonstrating that one cannot live without or independently from the other.'

Areas of discussion

Last time the two conferences were run together, in 2009, Mr Sanclemente explains that the asset management conference took as its theme small and medium wastewater utilities. This year, the overarching theme is energy efficiency. 'All these things are very common water economic problems,' he notes. 'Those going to the conferences can attend two different kinds of conference, depending on their interests. We felt it would be very interesting for the attendees, which is why we decided to do this.'

Though the conferences both have general topic areas already mapped out (see box), he notes that until all of papers are reviewed it is difficult to provide precise details on the topics to be presented. 'The economic aspect will be a very important part of the discussion,' he adds. 'We will talk about universal access to drinking water – in Europe, we have the Water Framework Directive, but not all countries have such legislation.'

Mr Sanclemente adds that another key area for discussion will be the differences between the approaches taken by different countries. 'For example, Greece, Spain and

Marbella, where the conferences will be held 24 to 26 April 2013.



Keynote speakers

Keynote papers for the economic conference will be given by Ariel Dinar of the University of California-Riverside, who will look at 'economic incentives and institutional arrangements in addressing increased water scarcity and quality problems: theory and case study'; and Leonard Carcolé, the general manager of Spain's Catalan Water Agency, who takes as his theme 'economic consequences of hydrologic basin planning, according to EU Water Framework Directive – from the water supply guarantee, to the good status of water bodies, going through the wastewater treatment.'

For the asset management conference, the keynotes will be by Helena Alegre, who will speak on 'why and how infrastructure asset management is a key for the efficient use of energy in urban water systems', and Willy Verstraete of the University of Ghent in Belgium, who will discuss 'towards an energy-efficient sewage treatment plant: current status and future trends'.

Italy are dry countries, whereas northern Europe has a lot of water. The solutions for everyone are very different. This is why certain types of tariff structures have been commonly used in the southern countries for many years – Spain, Italy and Portugal has decided to use rising block tariffs, while countries like Denmark, France, The Netherlands or Switzerland usually use uniform rates. This is because of the different situations in these regions, and their ability to provide water to their populations.'

He notes that people from across the world will be attending: 'There will be people from Asia, America and Africa as

well as Europe. These experiences from around the world are very important – understanding, for example, the experiences of African countries and Asian countries is very interesting – knowing what they are doing, because probably they are facing greater problems. It is good to have everyone here, to understand their situations and what they do.'

Access to clean water will be one key aspect of the event and energy efficiency will be another extremely important strand, he explains. 'I think the whole world is now talking about carbon footprints. It is also well known that energy is one of the main inputs in

water and wastewater systems. Achieving maximum efficiency in energy consumption allows utilities to reduce, or not increase, their water price and reduce their carbon footprint.'

Achieving this is a big challenge, he says, and part of the aim of the conference will be to explore ways of realising this aim. 'One goal of these conferences is to obtain results, and open the possibilities to experts from around the world.'

Mr Sanclemente is also extremely pleased with the conferences' organising committee, which includes IWA and LNEC's Dr Helena Alegre. 'Helena is an important leader, not only in the IWA but also in her country. It is fantastic to have the collaboration of people like Helena. We also have other very interesting people, for example Konstantinos Tsagarakis and Katerina Stamatelatou (both of the Democritus University of Thrace, in Greece), Francesc Hernandes and Maria Molinos (both of Valencia University, Spain) or Ed Smeets from The Netherlands. It is a very interesting group.'

The conferences' Scientific Committee (a lengthy list of well-known names) is currently finishing the preliminary choice of papers. Mr Sanclemente estimates that ultimately there will be between 70 and 80 papers in the economic conference and between 50 and 55 in the asset management conference, as well as around 24 poster presentations.

The event will be run across two and a half days, in four parallel sessions, two for each conference. 'Each session will be organized around homogenous topics,' Mr Sanclemente explains. The keynote presentations (see box) will cut across all four sessions, as Mr Sanclemente explains: 'Everyone will want to hear these, both people from the asset management and economic conferences. They will be very interesting to attend.' ●

For more information on these conferences, visit:
<http://iceam2013.es>



Carles Sanclemente



Helena Alegre

Improving Vietnam's drinking water: success of Water Safety Plan implementation

Vietnamese water supply company HueWACO has been working to improve its water quality and coverage in the province of Thua Thien Hue through the implementation of a Water Safety Plan (WSP), which highlights and monitors risks in the supply chain and improves cooperation between utility staff and stakeholders. **TRAN THI MINH TAM** discusses the initial developments and successes achieved over the first few years of using a WSP, and how the experience and lessons learned will help the utility assist other utilities within Vietnam to implement their own WSPs to improve drinking water quality throughout the country.

Thu Thien Hue (TTH) province is located in the central region of Vietnam, covering just over 5000km². The province includes Hue city and eight districts with a population of 1.2 million. Hue city covers 71km² and is the capital city of TTH province, consisting of 27 urban wards. It stands on the banks of the Huong River and has a population of 340,000 people.

Thua Thien Hue Water Supply and Construction State Company Limited (HueWACO) was established in 1909 and covers TTH province with 22 water supply systems and distribution networks that transport 170,000m³/day of water. The company built the first public water fountains in parks and busy squares in Vietnam, which have created a buzz about the value of clean water.

HueWACO has begun to implement a Water Safety Plan (WSP) to achieve: the provision of clean, safe and good-tasting water to 140 of the 152 wards and communes in TTH province by 2020; the connection of 80% of the provincial population and 100% of Hue city inhabitants to a supply of 300,000m³/day of water; a reduction in the rate of non-revenue water to 8% by 2020; and the provision of a satisfactory service to customers in order to contribute to the improvement of quality of life, community health and the development of the economy and tourism in TTH province.

Implementation of the Water Safety Plan

HueWACO approached undertaking a WSP programme after attending a World Health Organization training course on WSPs in 2007, and was selected as a pilot

area for Phase 1 of a WSP promotion programme in Vietnam.

The purpose of implementing a WSP is to achieve a safe water supply that meets the national drinking water quality regulation (QCVN 01:2009/BYT), a stable and continuous water supply, customer satisfaction and recognition

amongst residents and tourists that the water supply is safe.

Three working groups with different

Water source protection remains a challenge, with surveys being undertaken on the impact of pesticide use in agricultural areas. Credit: Hoang Tran / Shutterstock.com.



responsibilities were established to implement the WSP, analyze hazards and prioritize risk. Monitoring data from the operation and management of the system was used for each risk identification or assessment, with the majority of monitoring conducted as external or internal reviews. Survey result of consumers' opinions and water quality monitoring data were also used and a scoring matrix was tailored to evaluate each risk. Control measures and plans for improvement were considered, based on the risk factor matrix. The matrix helped WSP teams to score each risk with its likelihood and impact level on human life.

HueWACO developed plans based on identified hazards and control measures. Monitoring at each stage of water supply operation is necessary to enforce a reliable WSP. It was decided that identifying factors for measurement and critical limits were necessary in order to operate the system appropriately, so a monitoring plan was formed for corrective and preventive action. The frequency of monitoring should be decided with regards to the stability of each factor, so the frequency of monitoring of factors which experience little change can be reduced, whilst the frequency of monitoring of factors which experience greater change and are related to risk should be increased. This flexible frequency of monitoring is to be proposed instead of the fixed frequencies currently in the regulation.

Activities to support the development and implementation of the WSP have been carried out. HueWACO held training courses on advanced water treatment and water quality skills for operators, as well as community activities to promote water source protection. It also held an internal workshop on WSP implementation and building a WSP manual, and organized workshops and seminars on WSP. HueWACO also built a training facility to teach workers how to detect water leaks and planned supporting programmes. Supporting programmes by a domestic organization, Vietnam Water Supply and Sewerage Association (VWSA), and by international organizations such as the Japan International Cooperation Agency (JICA) and WHO were also carried out.

HueWACO accepted support from JICA and Japan's Yokohama Waterworks Bureau (YWWB), which included:

- Training and developing human resources
- Developing operational handbooks

- for essential machines and facilities
- Upgrading capacity of water quality management
- Holding seminars and workshops on safe water supply
- Upgrading capacity of water distribution network management
- Building maps to detect low water pressure and low residual chlorine areas
- Building a map of monitoring points in water sources to check causes of pollution
- Upgrading capacity of human resources development and personnel administration
- Training of trainers (TOT) course on teaching and facilitating skill

This was supported by VWSA and WHO and included documents on conducting WSPs and how to carry out WSPs. WHO held a TOT course on WSPs, which HueWACO sent staff members to.

Benefits and challenges

WSP implementation helped HueWACO to gain institutional, operational and policy benefits, to face to challenges and learn some useful lessons.

Institutional benefits

The communication and collaboration among WSP team members, stakeholders and customers has been improved. Now, many customers inform HueWACO about water leaks they find, local authorities inform HueWACO about water source pollution and the Department of Health gives HueWACO water quality information regularly. These relationships were built by implementing a WSP. Communication between HueWACO's staff has also been improved so collaboration between departments can be carried out easier than before. For staff members of HueWACO, awareness of service to customers, knowledge of the water supply system and understanding WSPs have been increased. Now, they understand that the key points of water supply operation are: water supply has to meet the national standards of drinking water quality; the water treatment process is controlled according to ISO9001:2008; water sources should be protected from pollutants; and water quality test is done according to standard operating procedures (SOPs) complying with ISO/IEC17025.

HueWACO and some stakeholders hold study tours and contests about water source pollution for students and pupils. Through these activities, the staff

of HueWACO, stakeholders, students and pupils have changed their attitude to safe water. Many staff members now think that they should understand the concept of a WSP and introduce it to people, and bill collectors are telling customers about safe water.

Operational benefits

HueWACO has improved or updated system infrastructure, including:

- An advanced and expanded laboratory
- Building new water treatment plants, setting up power generators, water pressure increasing stations and buoys to stop oil coming into the intake
- Improved and upgraded pipeline networks
- Setting up a fish tank monitoring system to detect pollution
- Installing an online water quality monitoring system in water treatment plants
- Installing a SCADA system to control water treatment process
- Applying new materials such as powdered activated carbon
- Applying new technology at WTPs such as lamella, dissolved air flotation, a hypochlorite generator, and UV disinfection

The water quality management system has therefore been improved. Monitoring points in water source areas were set up and a water quality map of the distribution network helped to find pipes to be replaced. There had been no previous monitoring of operations so HueWACO had not been able to detect hazards in a timely fashion. Now, the company monitors each process using risk management so it can detect hazards if they occur and can take corrective action properly and rapidly.

Documents are managed with ISO 9001:2000. HueWACO has developed 27 SOPs using ISO/IEC 17025 and 15 recording forms for the WSP, 22 WSP manuals for each water supply system and 16 operational handbooks on water treatment and water quality management. HueWACO is trying to evaluate the WSP with a QA tool by the WSP team as a method of informal internal auditing of each water supply system. Documentation is evaluated by an internal and external audit for ISO systems.

Policy benefits

The most important policy benefit of the WSP is ensuring community health.

People can access clean water for 24 hours and drink tap water directly. Severe waterborne disease outbreaks have not occurred in recent years and customers' complaints about water quality have been reduced. A high level of water loss is one of the main causes of declining water quality in distribution networks, so upgrading the pipeline is a main priority; however, it requires huge investment.

A WSP provides cost and time savings by reducing risk and hazard, and as a consequence HueWACO can increase the number of consumers and service coverage, which will contribute to one of TTTH province's strategic objectives. Social and economic development of the province will be promoted by improving public health.

The implementation of a WSP is remarkable evidence of good management of a water supply utility for a foreign donor or investor. Good implementation of a WSP gives more chances to find investment or financial support. HueWACO has taken part in projects funded by foreign countries such as JICA and ADB.

HueWACO has increased knowledge and experience of WSP implementation with national workshops, overseas workshops and seminars, training courses by WHO and VWSA and through studies by HueWACO itself. It is expected that HueWACO will support other water supply companies to implement their own WSP.

Challenges

Public confidence in drinking tap water directly is still not high. The custom of boiling water has been popular for long time and it is not easy to change customs, so one challenge for HueWACO is how to publicise safe drinking water more effectively.

Water source protection is a challenge which requires cooperation between multiple stakeholders, especially WSP team members. Catchments and raw water sources are still not controlled perfectly. Due to industrialization, urbanization and climate change, water resources have been threatened in terms of pollution and shortages, so HueWACO is forming an action plan to survey and

inspect water sources. Surveys in upstream areas of Huong River and Bo River include studying the effect of livestock and the amount of pesticides sprayed in agricultural areas.

Conclusion

Responsibility for a WSP lies not with any individuals but with organizations. All stakeholders must be involved in WSP activities to make a WSP effective.

HueWACO will share its experiences with other water utilities within the country and region and help their WSP implementation. The company would like to contribute to make water supply utilities in Vietnam more resilient and reach the high standards achieved in other countries. ●

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Regional Utility Management Conference Improving Performance in Emerging Economies 13-15 May 2013 - Tirana, Albania



ABOUT THE CONFERENCE

Water supply and wastewater utilities in emerging economies are not performing as they must, if they are to meet the needs of growing populations in their service areas. This Conference focuses on improving service delivery, controlling costs, increasing efficiency, and managing assets. The Conference invites utility managers, senior utility staff, consultants, academics, and management technology providers to join the debate and contribute to the future success of water supply and wastewater utilities.

IMPORTANT DATES

End of Early Conference Registration 15 March 2013

Deadline for Pre-Conference Workshop Registration 15 April 2013

CONFERENCE THEMES

- Water Sector Reform-Is it happening; Is it working; and Will it ever end?
- Corporatization-Is this the only way forward? • Water Resource Management-Do you know how much water you supply and what your customers demand? • Transparency-What should you monitor; who should monitor; and how does this drive performance improvement? • Decentralization of Government-Is it helping or hurting? • Financial Management: Are finances flowing the wrong way; how to balance the books? • Asset Management and Capital Reserves: Do we really understand them and their cost impacts?
- Test Based Certification-Will it raise quality of performance and reduce political interference? • Aggregation of Utilities-Can it really be voluntary and how? • Customer Service: Do you know your customers and do they know you? • The Utility Question: Are we running a business or running a budget?
- Private Sector Participation: Can it really improve performance and how? • Natural Monopoly Regulator: Lion or paper tiger, which is best? • Tariff Policy and Strategy: Can we be "Pro-Poor" and financially self-sustaining?



PRE-CONFERENCE WORKSHOPS 13 MAY 2013

- Management Delegation to Improve Staff Performance and Accountability.
- Private Sector Participation - How Should It Be Viewed and Applied Today?

E-MAIL: utilityconf@shukalb.org

WEBSITE: www.shukalb.org/utilityconf

Supporting publication:

Low cost remote datalogging

Wireless technology company HWM has launched the OmniColl network monitoring system that uses battery-powered radio transmitters to collect data wirelessly.

The OmniColl system uses a modular, radio-based communications platform to provide rapid data transfer at minimal cost, with the ability to integrate many different measurement parameters, says the company. The system can automatically collect data from thousands of monitoring points every 15 minutes for up to ten years, without any wired connections or mains power. Its unique infrastructure design eliminates many of the costs traditionally associated with a communications network, such as installation, wiring and ongoing data



transmission charges, says HWM.

OmniColl is suitable for all currently available sensors. For example, the same system can be used to monitor usage in a District Metered Area (DMA), identify leakage, control pressure, read meters, analyse building performance, provide energy efficiency modelling and track rising or falling water levels. ●

www.hwm-water.com

Global Water and Thames Water extend partnership to research improved service

GWR Global Water Resources Corp., Global Water Resources, Inc. and UK utility Thames Water Utilities Ltd. have announced that they have entered into an agreement to research how they can explore opportunities using Global Water's FATHOM platform by constructing a model customer service office designed to deliver customer service to over 60,000 of Thames Water's residential customers and all commercial customers that consume more than five megalitres of water per year.

The FATHOM platform has been

proven to improve customer service and lower operating costs, says Global Water, and under this agreement, Global Water will customize FATHOM's cloud-based Customer Information System (CIS) to deliver Thames Water-specific elements to further enhance these abilities. This project leverages the initial automated metering infrastructure pilot work completed by Thames Water and Global Water, and will explore the benefits of real-time data to customers, providing them actionable information on their water use through FATHOM's customer portal. ●

www.gwfathom.com

Yorkshire Water selects PI System for real-time data

OSIsoft, LLC, the provider of the PI System, has announced the signing of an Enterprise Agreement with UK utility Yorkshire Water, which will expand the use of the PI System as its real-time data and event infrastructure for clean water and wastewater management. The PI System provides Yorkshire Water with a real-time data infrastructure that allows data to be collected from devices and systems from more than 40 different vendors throughout the utilities network.

Yorkshire Water uses both real-time and historical data provided by the PI System to assist with many facets of water management, including: controlling water leakage, reducing combined sewer overflows, reducing energy costs, and improving bathing water quality to help preserve swimming beaches. The expanded scope of the PI System will provide increased situational awareness and real-time readiness to Yorkshire Water employees whether they are in the field or at the office, says OSIsoft. ●

www.osisoft.com

5th IWA International Conference on Benchmarking and Performance Assessment (Pi2013)

9-12 April 2013, Medellin, Colombia
Web: www.iwabenchmarking.com/pi2013

Asset Management for Enhancing Energy Efficiency in Water and Wastewater Systems

24-26 April 2013, Marbella, Spain
Web: <http://iceam2013.es>

3rd International IWA Conference on Water, Economics, Statistics and Finance

24-26 April 2013, Marbella, Spain
Web: <http://iceam2013.es>

Regional Utility Management Conference - Improving Performance in Emerging Economies

13-15 May 2013, Tirana, Albania
Web: www.shukalb.org/utilityconf

7th International Conference on Sewer Processes and Networks

28-30 August 2013, Sheffield, UK
Web: www.shef.ac.uk/spn7

LESAM 2013 - IWA Leading Edge Conference on Strategic Asset Management

10-12 September 2013, Sydney, Australia
Web: www.lesam2013.org

Water Loss 2014

30 March - 2 April 2014, Vienna, Austria
Web: www.iwa-waterloss.org/2014

13th International Conference on Urban Drainage 2014

7-11 September 2014, Sarawak, Malaysia
Web: <http://www.13icud2014.com/index.php>

IWA World Water Congress & Exhibition 2014

21-26 September 2014, Lisbon, Portugal
Web: www.iwa2014lisbon.org

LESAM 2015

17-19 November 2015, Yokohama, Japan

All events listed are organised or supported by the International Water Association