

Sustainable Water

State of the Water Sector Report

Additional Water Company Case Studies

Governance

South West Water – Engaging the company more fully

South West Water's parent company, Pennon Group Plc has formed a Corporate Responsibility Committee in place of its former Environmental Committee. The Corporate Responsibility Committee comprises all of the Non-executive Directors and the Chief Executives of South West Water and Viridor. Its priorities are the environmental, occupational health and safety and governance aspects of the Group.

South West Water has a Sustainability Forum, which meets quarterly to drive forward the agenda on environmental issues such as carbon management, sustainable travel plans and biodiversity management on operational sites. The Forum also promotes South West Water's interaction with society e.g. in celebration of 175 years of water treatment for Exeter, Pynes water treatment works opened to the public as part of Heritage Open Days in September 2007.

South West Water – Engaging supply chain

In 2007, South West Water introduced its supplier awards, with three categories: Innovation, Continuous Improvement and Environmental Sustainability. These awards recognise the contribution that suppliers make to South West Water, and build on the company's long established collaborative approach to supplier management. A total of 50 entries were received, and prizes awarded at the annual Supplier Forum in October 2007.

South West Water continues to promote Environmental Workshops, run by Envirowise, to its SME (small and medium enterprises) suppliers.

Yorkshire Water - Stakeholder engagement

Yorkshire Water recognises the importance of stakeholder engagement and proactively communicates with key regional stakeholders through its independent Environmental Advisory Panel. This comprises around 25 key environmental stakeholders from both the voluntary and statutory sector, including the Environment Agency, Natural England, Yorkshire Wildlife Trust and RSPB. The Panel, chaired by the Regional Director of Natural England, meets quarterly with the key objective of offering advice to Yorkshire Water on environmental issues in order to ensure all further environmental improvements and investments continue to offer excellent value for money to Yorkshire Water's customers and deliver real environmental benefit.

Yorkshire Water - Working with Partners

Yorkshire Water recognises the critical role that contractors play in environmental performance. The company therefore aims to develop a partnership approach, rather than just a client contract relationship. As part of this, Yorkshire Water has established an Environment Forum to bring its main contract partners together to drive best practice environmental performance. This has actively built a collaborative network that identifies and implements improvements, efficiencies and initiatives. One of the most successful aspects of the Environment Forum is the opportunity to share learning from pollution incidents and environmental near misses, therefore leading to reduction of future risk. This has led to a significant decrease in partner-related pollution incidents since it was established

Scottish Water - What drives Sustainability?

When set up in April 2002, it was recognised that Scottish Water is a key player in the development of a Sustainable Scotland. As such a Sustainable Development Duty was placed on Scottish Water under the Water Industry (Scotland) Act 2002, to '*in exercising its functions, act in the way best calculated to contribute to sustainable development*' Ministerial Guidance on how to comply with this Duty was provided to Scottish Water.

The revised Sustainable Development Policy is being implemented through a 25 year Sustainable Development Strategy, which aims to fully embed SD into Business Strategies across the business. For example, SD actions are being embedded within the 25 year Procurement Strategy to fully implement Scottish Water's sustainable procurement process, and the company has engaged key stakeholders through Supply Chain conferences and events.

Dwr Cymru Welsh Water - 'Green Plumber of Wales'

Dwr Cymru Welsh Water and leading UK training provider Connaught Academy are working together to arm Welsh plumbers with key skills to tackle the environmental challenge and conserve water in the home. Dwr Cymru Welsh Water is piloting a new water efficiency module for the plumbing training course which will focus on best practice in the installation and maintenance of water efficient plumbing equipment. This pioneering initiative is aimed at improving the skills of plumbers to enable them to fit Welsh homes and businesses with water efficient equipment for years to come. The first group of Connaught Academy students are about to embark on the course and once they have completed their training, they will be recognised as the first 'Green Plumbers of Wales'.

Sourcing water

Northumbrian Water - Langford Recycling

The Essex part of Northumbrian Water's southern area is one of the driest counties in the country and used to import over 50% of its water from outside its boundary. Due to environmental constraints, no additional water was available within Essex so innovative solutions had to be found.

The Langford recycling scheme uses biological, chemical and ultra-violet light treatments to disinfect, and remove phosphate, nitrate and ammonia from waste water that is currently piped into the Blackwater Estuary. The treated water is released into the River Chelmer, providing more water for pumping to Northumbrian Water's Hanningfield reservoir and for its Langford water treatment works, further downstream. There, the abstracted water undergoes treatment to bring it up to drinking water standards.

The scheme is the first of its kind in the UK and is the result of 10 years of research and development. Northumbrian Water worked closely with the Environment Agency and the Drinking Water Inspectorate during the development of the scheme. It provides up to 30Ml of water a day, equivalent to 17.8 Olympic-sized swimming pools and represents 8% of additional water resources.

Construction on the scheme began in the autumn of 2000. The contractors were members of the Construction Federations' Considerate Construction Scheme and the scheme won the bronze prize at the annual Considerate Construction Awards. Northumbrian Water regularly liaised with local people, keeping them informed of activities on the site and ensured that the environment was protected. Working with English Nature and Essex Wildlife Trust, Northumbrian Water relocated slowworms and lizards and re-routed a pipeline to avoid disturbing a badger sett that was found on the site.

The Langford recycling plant, which cost £14.5 million, was opened by Jonathan Porritt in 2003. The plant's state of the art technology has attracted national and international attention and has won several big awards including a golden apple at the Green Apple Environmental Awards.

Essex and Suffolk Water - Expanding Abberton

Over the last ten years Essex & Suffolk Water has introduced further leakage and demand management measures, and added new sources of supply. However, there are still insufficient water resources available to Essex & Suffolk Water to meet the predicted demand for water in the future. The demand for water is constantly increasing to meet the needs of an ever growing population. To maintain a sustainable supply for Essex and Suffolk Water's customers, an enlargement to Abberton reservoir is planned that will see the reservoir emerge as a bigger, more wildlife friendly version of itself.

Essex is the driest county in England, typically receiving half the national average rainfall. But demand is predicted to rise by around 6% over the next 25 years, almost entirely due to an increase in population. After more than 15 years of investigation and consultation, Essex and Suffolk Water plans to help meet this additional demand by increasing the water storage capacity of an existing reservoir Abberton, near Colchester in Essex. Raising the top water level of the reservoir by 3.2 meters will provide an extra 58% storage – the equivalent of an extra 15,000 million litres of water. During the planning for a long term and sustainable water supply, around 250 possible sites around East Anglia were considered.

Enlarging an existing reservoir requires a smaller amount of land which is good news for the environment. The reservoir is one of the most important in Britain for wildfowl so the enlargement has been designed to provide areas of shallow water as habitat for the feeding birds. Other measures have also been put in place to enhance the areas suitability as a home for wildfowl.

As well as improving the site for wildlife, the proposals will enhance Abberton reservoir for visitors and the local community. The existing Essex Wildlife Trust visitor centre will be relocated to a larger and improved site. The company is also aiming to increase the network of footpaths, cycle routes and bridleways around and near the reservoir. Planning applications for the Abberton Scheme were submitted in December 2007. The outcome of these applications is still pending but the plan is to start construction work at the reservoir in 2010 and for it to be fully operational by 2014.

Yorkshire Water - Managing water supplies

Yorkshire Water has installed an innovative Rainwater Harvesting System at its Head Office site. The collected water is used to replace the treated water for flushing toilets, therefore considerably reducing their water consumption and environmental impacts. The project is part of a large R&D programme which will allow Yorkshire Water to inform and advise customers and partners on the recycling of rainwater. The system is expected to reduce water consumption at the site by up to 1000 cubic meters per annum, leading to a potential cost saving of £2500.

Water and wastewater networks

Thames Water - Water and wastewater networks

London has over 17,000 kilometres of water mains beneath some of the busiest streets in the country. Thames Water continues to find and fix leaks around its network in London and the Thames Valley, fixing almost 70,000 leaks in 2007/08: an average of one leak every seven and half minutes, 24 hours a day, 365 days a year. However, replacing the oldest and leakiest parts of this ancient network is the only way to make long-term, sustainable reductions in leakage.

Much of the old network has been in use since Victorian times and is no longer able to withstand the pressures of modern-day traffic and the continuous movements of the ground as it expands and contracts through the seasons with changing temperatures and moisture content. Thames Water's Victorian Mains Replacement programme, which began in 2002, has so far replaced more than 1,250 kilometres of old cast iron mains with new flexible and durable plastic pipes. In 2007/08 the company replaced more than ever before, with 527 kilometres of new mains being laid - enough to stretch from London to Edinburgh. By 2010, Thames Water will have replaced more than 1,900 kilometres of pipe.

As much work as possible is carried out using 'no dig' technology, avoiding the need to create long trenches. Wherever possible, a new plastic pipe is inserted within the old metal one. This work inevitably involves disruption, but will provide long-term benefits to residents. Thames Water is working hard to minimise any inconvenience by planning activities with local authorities, Transport for London, London Buses and the emergency services.

Whilst environmental and social sustainability is a vital part of future planning, it is important to recognise that it is also part of day-to-day business operations. The Mains Replacement programme, for example, is not just about replacing leaking pipes - it is a total redesign of the system. This is allowing the company to decrease the length of the network by around 20% in many locations, reducing environmental and community impacts, and creating a more efficient water distribution system for the capital.

'Leakfrog'

Four Thames Water employees have developed a new invention to reduce the millions of litres of water lost through customers' leaking pipes by up to a quarter. The 'Leakfrog' device is attached overnight to a water meter. It detects the amount of water escaping from customers' pipes, thereby allowing customers to find and fix the leaks and reduce their water bills. The frogs are easily fitted in large numbers to Thames Water meters and tell them if a leak is present, something previous methods have not been able to do on such a large scale or at such low cost.

Anglian Water - Fats, oils and grease

Anglian Water is promoting a scheme with J & H Bunn Ltd (Great Yarmouth) and Agri Energy (Northampton) for the collection of fats, oils and greases (FOG), which can be converted into biodiesel. This free scheme is unique because it involves linking directly with environmental health officers from local authorities across the region to encourage restaurants, takeaways and catering outlets to have their waste FOG collected.

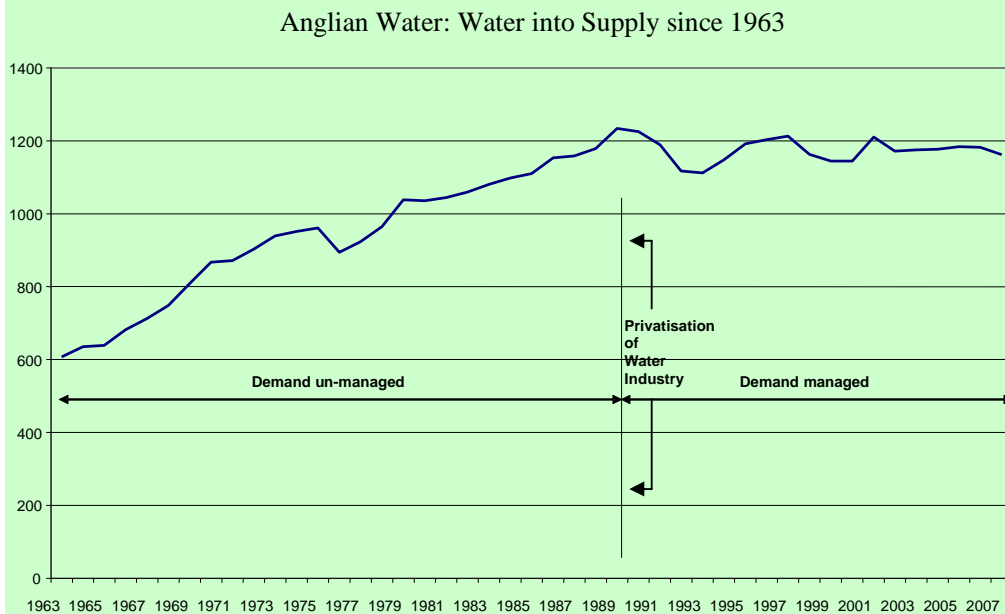
Schemes have been launched in Great Yarmouth, St Ives, Corby, Ipswich, Skegness, South Holland, Braintree and Basildon. Anglian Water has compiled a charter and mission statement with the Chartered Institute of Environmental Health and the Environment Agency, the first of its kind in the UK water industry.

Anglian Water – demand management

The drought of 1995 put water leakage firmly in the spotlight. Under pressure from Government, mandatory leakage targets were set by Ofwat and companies have made significant efforts in reducing leakage. However, leakage control was a fundamental and well established process at Anglian Water since privatisation in 1989.

Anglian Water operates in the largest and driest region of England and Wales where rainfall is equivalent to half the national annual average. Therefore, Anglian Water has historically managed its precious resources wisely. Leakage control, amongst other measures to manage demands such as customer metering, are fundamental to the way it operates. In spite of the

growth of housing development of over 20,000 dwellings per annum since 1989, the highest in the country, water Distribution Input (DI) has remained steady. During this period, leakage has fallen by over 100 MI/d and domestic metering has increased to 63% of households, the highest metering base in the UK.

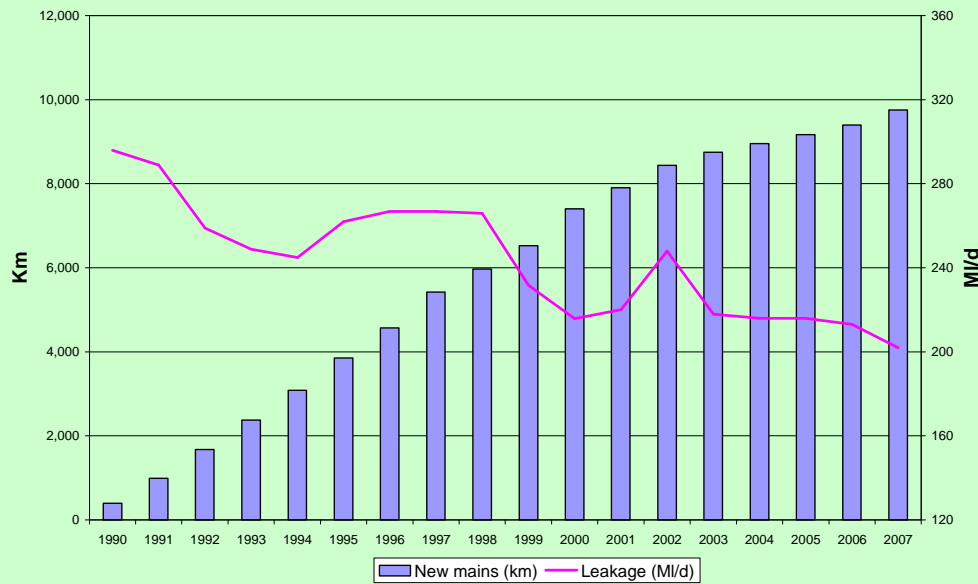


In the early 1990's, just after privatisation, Anglian Water embarked on a major project to install district metering throughout the network. About 3,500 meters were installed dividing the whole distribution network into 1,800 District Metered Areas (DMAs). All the meters were connected to the corporate telemetry system enabling Anglian Water to respond to leaks almost as soon as they occurred, minimising leakage and the making the process of looking for leaks in this large region far more effective. This form of data gathering has recently become more widespread within the industry and other water companies are looking to achieve full telemetry coverage throughout their DMA's.

At the same time, Anglian Water invested in a major programme to replace its ageing iron mains with jointless polyethylene pipes, minimising leakage and improving the quality of water to customers. As a result of this programme, almost 10,000 km out of the 37,000 km of the distribution mains laid to service were either newly developed or replaced the old iron mains. Therefore, more than 25% of the distribution mains are under 18 years old.

Today, Anglian Water enjoys a leading position with its leakage performance. At 5.5 m³/km of main/day it is almost half the national average of 10.1. But there is no place for complacency, Anglian Water employs a dedicated team of leakage engineers and analysts putting a great deal of effort on training and development to ensure it remains at the forefront of technology to tackling waste.

Anglian Water: Progress on leakage since 1990



Scottish Water – Improving service

In Scottish Water's first 4 years between 2002-2006, the company replaced 2,990 km of old water mains at a cost of £219 million, which is a great achievement accounting for 6% of the water distribution network. Scottish Water is now working towards establishing what the Economic Level of Leakage is in Scotland and is committed to reducing leakage as part of making Scottish Water a sustainable business going forward.

On 30th July 2002 the average monthly rainfall usually experienced by Glasgow fell in just 10 hours. The flooding that followed right across the city highlighted major problems with the ageing drainage system which could not cope with such extreme weather conditions.

Significant efforts have been made since 2002 to reduce the risk of flooding; however there is no quick fix and exceptional rainfall still has the potential to flood areas of the city. Major investment and effort will be required over the next 25 years to ensure that Glasgow's drainage network can cope with changing weather patterns, improve the environment and support modern development requirements.

In order to develop relevant, sustainable solutions following the flooding in 2002, an innovative multi-agency taskforce was created to evaluate the city's complex drainage network, and those in the surrounding areas that impact on it.

The Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) is a unique partnership formed by organisations most closely involved with the operation of the sewage and drainage network – Scottish Water, Glasgow City Council, the Scottish Environment Protection Agency (SEPA) and Scottish Enterprise. Examples of actions already completed are:

- Multi million pound investment in sewerage network improvement.
- Almost 500 properties in the Glasgow area have been removed from the At Risk Flood register since 2002.

- Replacement of significant lengths of sewers – including projects to increase capacity to cope with storm volumes.
- A £6 million initial investment to tackle intermittent discharges from the sewer network.
- A major Council-led flood alleviation scheme.
- A £16 million Council watercourse related scheme.

A range of further measures will be required including:

- Improved surface water management to prevent the sewerage system from being overwhelmed by diverting into ‘green corridors’, flood plains or storage areas until a storm passes. Surface water does not need to be treated in the sewerage system.
- Allowing the water to flow more freely by opening up historic watercourse culverts covered over in the past.
- Engineering works such as upgrades for waste water treatment works (WWTW) and, possibly, building storm attenuation tanks.
- Integrating solutions for watercourses and sewers to make best use of resources

This integrated approach will not only reduce flood risk throughout Metropolitan Glasgow, but will also improve water quality in the rivers and burns, support sustainable economic growth and infrastructure development, allow nature and the environment to flourish, and make improvements to green space that will improve the quality of life for residents and visitors.

Scottish Water has also recently taken on legal responsibility for public sustainable urban drainage systems (SUDS), as defined within the technical manual Sewers for Scotland 2. Scottish Water is currently working with local authorities to get formal agreement for integrated drainage systems, which will include SUDS systems.

Water consumed

Thames Water - Largest ever water audit programme

Thames Water launched its largest ever water audit programme with domestic customers in 2006. Phase 1 (from 2006 to September 2007) delivered 962 plumber assisted audits in metered households and installed 3,883 water saving devices, including dual-flush retrofits, aerating showerheads and taps, leakage alarms and shower timers. On the commercial side, Thames Water has an ambitious programme to deliver 17,000 audits from 2007-2010.

Waterwise – Water consumed

Whilst the need for wide-scale demand management is widely accepted in the UK, the water industry and regulators agree that more robust economic evidence would support the development of water demand management measures as options in their own right. This is especially important when demand management measures are compared with new resource development options in the water resource planning process. Approximately twenty water companies are now engaged in water efficiency trials across England. Most of these investigate the efficacy of measures to reduce demand; these range from retro-fitting toilets and showers with efficient models, “visit and fix” audits, self-audits (includes water saving check list and basic retro-fitting equipment), altered tariffs and billing systems, and general awareness campaigns.

Waterwise has developed scenarios for large scale water efficiency programmes based upon the outcomes of water company efficiency projects. These scenarios contain robust cost and benefit information which can be used to inform water company investment into water efficiency with particular relation to the Periodic Review. The scenarios look at different approaches to

delivering water efficiency and present various logistical options and their influence on the costs and benefits, for example the methods used to identify households for retrofit and the staff used to carry out the work.

South West Water - Improving water quality

South West Water is working with landowners to promote improved catchment management or 'Upstream Thinking'. In order to improve raw water quality, the company is working in partnership to prevent fertilisers being lost from land, reduce soil loss from rural land into the rivers (for example during storms) and increase the extent of wetlands, which also benefits biodiversity.

South West Water continues to work in partnership with the Exmoor National Park Authority, Natural England and the Environment Agency on the Exmoor Mire Restoration Project. Many kilometres of old peat cuttings, drains and ditches are being blocked up to restore the moorlands, re-establish the natural stream hydrology and improve the ecology of the River Exe and its headwaters. Slowing down run off from uplands helps protect rivers and sewers from flooding in urban areas. Wetlands and bogs store carbon, so restoration of the peatlands could play a role in mitigating against global warming – the average accumulation rate of 1mm peat over 1 hectare of moorland every year will give a yield of 10 tonnes of peat per hectare per year, so each hectare of moorland actively accumulating peat will lock up approximately 1 tonne of carbon from the atmosphere every year.

South West Water is participating in a pilot project with the Westcountry Rivers Trust, the Environment Agency and farmers to reduce run off and improve raw water quality in streams running into Upper Tamar Lake near Bude in Cornwall.

Three Valleys Water - management of contaminated groundwater to benefit public supply

Bromate pollution of part of the Chalk aquifer in Hertfordshire was first discovered in 2000 during routine sampling in preparation by Three Valleys Water (TVW) for new regulatory standards for this chemical. This resulted in one pumping station (9MI/d) being immediately removed from supply and close monitoring of another (also 9MI/d) which had low levels of the contaminant. Investigations into the source of the pollutant identified it to be a former chemical works (which ceased activities in 1985) and is now a housing estate. Subsequent research has established this to be the largest pollution plume of its type in the UK.

To address this issue of both actual and potential loss of resource, TVW have undertaken a number of investigations and significant capital investment. Direct treatment of this water for public supply is not a viable option. In 2001 a pipeline was laid to an existing Water Treatment Works with the aim of blending water from the lower impacted source with water from unaffected sources to keep bromate concentration below the prescribed value in the final water. GAC was installed to further reduce the concentration of bromate in the water leaving this source.

In 2003 TVW obtained a Licence variation from the Environment Agency to relocate the abstraction volumes from the closed, highly impacted source, to other unaffected sources on a temporary basis to make up for the shortfall in available resource due to the closure of this location. By 2004 it became obvious that, in addition to a seasonal variation, there was a rising trend in bromate levels at the less impacted source. This had the potential to overwhelm the GAC and blending option making this source redundant as well, resulting in even more capital investment to replace this source.

Following successful trials in 2005/06 a licence was granted to TVW by the Environment Agency in 2007, which gives TVW the right to abstract water from the highly impacted source, treat it by reducing the bromate and disposal of the by products to the sewage system. This pump and treat system (aquifer remediation) decreases the bromate concentration in groundwater sources down gradient, allowing greater operational flexibility and more water to be available for public supply than would have otherwise been the case.

To date, the costs of managing this pollution have been met by water customers, not the polluter. The issue was heard before a public inquiry in April/May 2007, to establish the “appropriate person” to remediate this pollution. A decision from the Secretary of State, linked to Part IIA of the Contaminated Land Act, is still awaited.

Research and other activities are currently still in hand to gain a better understanding of the flow processes within the plume and for alternative pump and treat processes to be established. During this entire period TVW has maintained supply to customers, both in quantity and quality at the lowest cost possible. Once an Appropriate Person has been identified, they should become responsible for the ongoing pump and treat costs as well as the duty to investigate further remediation strategies.

United Utilities - Water efficient showers

Sustainable management of the water resources United Utilities uses is vital for protecting the environment and securing the supply of drinking water in the event of climate change. United Utilities work to 25-year water resource plans which help them forecast and manage likely impacts on supply and demand, including the effects of climate change. United Utilities have published their draft water resources management plan for 2009 for consultation. This provides a comprehensive statement of water supply and demand forecasts to 2035, and the actions United Utilities plan to take around water supply sustainability.

United Utilities actively promote the efficient use of water by their customers, through publicity and education initiatives (such as hosting 10,000 visits to their environmental classrooms each year) as well as trialling innovative techniques of water reduction. For example, in the last ten years United Utilities have distributed over 550,000 cistern devices free of charge to reduce flush volumes, and provided over 20,000 discounted water butts. United Utilities have carried out around 400 “visit and fix” household audits. Additionally last year United Utilities promoted water efficiency to 14,000 farms, parks and gardens by issuing special water efficiency leaflets. Recent research with Liverpool John Moores University identified the water and energy saving potential of aerated shower heads and is being expanded into a wider customer study to look at acceptability of these devices and their financial and environmental savings.

Severn Trent Water - Be smart award

What is it about?

The Be Smart Programme helps to educate school children about the importance of water and recognises schools that are making a commitment to the wise use of water.

Schools entering the Be Smart scheme are challenged to meet four goals: auditing water use in schools; promoting water efficiency; promoting the benefits of drinking water and promoting a greater understanding of water issues locally and globally.

How does it work?

Each participating school is allocated a Severn Trent Water employee to act as mentor. The mentor provides the lead teacher with support on how the school can meet the four goals and acts as a facilitator to access other resources and information from the company. Once schools have

implemented their action plan they are assessed by a Be Smart assessor (a trained company employee). Upon completion of the programme, the children are presented with certificates and the school a trophy.

The scheme is also tailored to work within the existing school curriculum including maths, citizenship, ESD, English, Geography and Science, providing teachers with new ways to engage and educate pupils on water issues.

Business objective

Be Smart is part of Severn Trent Water's commitment to education and helps the company to promote water efficiency to the community. The involvement of employees in the programme also provides personal and professional growth opportunities.

The impact

Be Smart promotes positive water behaviours amongst the schools in the region (Kids Industry research 2007)

- The Be Smart mentoring scheme provides a range of opportunities for Severn Trent Water employees, not only in demonstrating a concern for communities and the environment but also in training and development.
- Be Smart provides a practical framework to help school children meet their targets across several areas of the National Curriculum.
- Be Smart promotes positive water behaviours amongst the schools in the region.
- Benefits come from the reduced water use by schools as they work out how to best conserve water resulting in reduced water charges.

Cost of water

Northumbrian Water - Affordability and metering

Having a water meter fitted can mean lower bills for water and sewerage services for many of Northumbrian Water's customers; it can also raise awareness of the amount of water a customer uses.

Northumbrian Water advises of the potential benefits by placing an insert into the annual bills of those customers who are currently on an unmeasured tariff. More information is available on the company's website and customers can use the calculators both on the site and on that of Uswitch.com to work out whether they would make a saving by having a meter fitted.

There are environmental benefits to having a water meter installed as it encourages people to waste less as they are thinking about the water that they use. This helps to conserve valuable resources and reduces the amount of energy used in the water treatment process.

Northumbrian Water offer a free survey to discuss the location of the meter and in the majority of cases it is fitted free of charge. If due to technical reasons they are unable to fit a meter, alternative billing arrangements can be made. Northumbrian Water aims to complete the installation within 90 days of receiving the completed application.

Northumbrian Water allows customers to pay via a monthly budget scheme which helps them to manage the household account. If the customer does not find that the meter installation has been beneficial to them, they can revert to their previous charging method, following receipt of sufficient bills to enable consumption over the 12 months to be properly evaluated.

Three Valleys Water - Customer debt and affordability

Three Valleys Water (TVW) has taken action to help customers manage the payment of their water bills. TVW introduced a risk based scoring system, based on previous payment history, to gain a better understanding of debt and to develop appropriate support for customers. TVW have made changes to all their communications with customers with the aim of prompting them to alert the company when there may be debt concerns. In addition TVW has increased its outbound calling of customers to ensure it has the correct information about the property and the customer so that where appropriate TVW can make applications on their behalf to Water Direct.

In addition TVW has reviewed and reduced its panel of debt collection agencies so that it only works with the top performing agencies and all TVW's own Debt Collection staff have received additional training so that they can further help customers. TVW continue to refer hardship cases to assistance funds and has credited £195k to customer accounts. TVW continue to help support customers to manage debt to ensure the affordability of water for everyone.

Scottish Water - Cost of Water

Scottish Water is now running the water industry in Scotland at £3 million less every week than when it was formed in 2002, while at the same time, delivering massive improvements to the water infrastructure and providing better service.

Household water and waste water bills in Scotland for 2008/09 will increase by less than inflation. This signals a continuing period of stability in water and waste water bills at the same time as Scottish Water is delivering the largest investment programme per household in the UK.

This is the third year of below inflation increases for Scottish Water's household customers as part of the regulatory settlement which saw water charge levels set by an independent process of economic regulation led by the Water Industry Commission (WIC) for Scotland.

The WIC, in a recent report said: "Customers are already seeing the benefits of Scottish Water's lower costs in their bills. Water and sewerage bills in Scotland now compare well with those in England and Wales. The prospects for future bills in Scotland are also good as Scottish Water continues to meet - and beat - their expectations of improved efficiency."

Thames Water - Customer Assistance Fund

Thames Water's Customer Assistance Fund continues to help increasing numbers of low-income customers who are suffering financial difficulty. Over 6,000 customers have been referred to the fund since it was set up in 1997, including 944 additional customers in 2007/08. During 2007/08, Thames Water made donations exceeding £260,000, a 40% increase on 2006/07. Encouraging sensible budgeting has meant that about 70% of customers who received donations now pay their bills regularly.

Wastewater

Yorkshire Water - Sludge phyto-conditioning

Yorkshire Water has developed a sludge treatment process called Sludge Phyto-Conditioning, which involves growing certain grass types on digested, conditioned sludge laid out in dedicated beds to develop a high quality organic material that can be further processed into a top soil product. The process enables local green waste and mineral waste to be recycled in the conditioning phase of the process - Yorkshire Water already receives green waste from council collections in Bradford, Calderdale, Sheffield, Kirklees, Wakefield and Leeds. When processed

into topsoil the product meets the requirements of BSI 3882 (2007) Premium Topsoil. The product won the 2006 National Recycling Awards Environmental Product of the Year and, due to its residual calorific value, is currently being assessed for its fuel potential. Sludge Phyto-conditioning is currently implemented at three Yorkshire Water treatment sites, with plans to roll it out across the region.

Scottish Water - Sludge Strategy

Scottish Water developed a 20 year Sludge Strategy in 2005, forming the basis for the management of all Scotland's sludge up to 2025, and informing successive regulatory investment periods.

Scottish Water carried out a Strategic Environmental Assessment (SEA) of the key sludge outlets in Scotland, at a national level and also for the preferred outlet in each of the 18 sludge catchments in Scotland.

The SEA process also allowed Scottish Water to engage and educate stakeholders through the various stages of the process. Key stakeholders including SEPA, Scottish Natural Heritage, Historic Scotland and the Scottish Executive were invited to attend a series of workshops, initially to define the scope of the SEA and then to work through the assessment process.

Once the SEA was completed, the Environment Report and the draft Strategy were launched for public consultation. Following this process, consultees comments were taken into account, where appropriate within the finalisation of the SEA report and the Sludge Strategy.

The SEA process enabled Scottish Water to take a long term view on what works best for Scotland in terms of treatment process and outlets, and also what works best at a local level, taking into account environmental standards and local sensitivities.

Climate change

South West Water - Hydro-power at Littlehempston Water Treatment Works

Water is taken from Burrator reservoir in Dartmoor National Park, through a spine main in the South Hams to Littlehempston works near Totnes. The spine main is capable of delivering flows in excess of 100 Mega litres a day. The hydro is situated at the inlet to the works to use the head of water. A 500kW turbine drives a generator to produce 2,400 MWh electricity, which is used on site.

Scottish Water - Climate Change Adaptation and Mitigation

Scottish Water has committed within its Sustainable Development Policy to 'mitigate the impacts of climate change on their operations, and minimise emissions of greenhouse gases'. Scottish Water has developed 25 year Climate Change Adaptation and Mitigation strategies, and identified a staged approach to carbon reduction for the company.

Scottish Water has recently completed the first assessment of its carbon footprint. The company's operational footprint is on a rising trajectory – electricity demand grew 10% from 2000 to 2006 and the company expects a similar increase in the 2006-2010 regulatory period.

Scottish Water currently generates 5% of electricity demand from its own renewable schemes. It have the potential to double this within its core asset base, from hydro schemes to combined heat and power, and will continue to explore these opportunities with a view to promoting investment where it is prudent to do so.

Scottish Water has carried out a review of the impact of key legislative drivers on the carbon footprint of its assets. For example, a review of the upgrades to meet the Urban Wastewater Treatment Directive requirements at three waste water treatment works led to an increase of electricity use and associated greenhouse gas emissions ranging from 150% to 2400%. This reflects a complete overhaul of the plant moving from a purely screening or settling function to a full activated sludge process and sludge treatment centre.

Northumbrian Water - Globe Project and North East Weather Radar

Northumbrian Water (NWL) has worked with independent experts to identify and understand the impact climate change will have on its business. Climate change readiness assessments found NWL has a good understanding of the issues it faces from climate change and has carried out detailed assessments. NWL has also worked with experts to understand the potential impact on its assets and shared information with the internationally unique North East Climate Change Adaptation Study. An action plan was published on 1 May 2008.

In the North East weather data coverage is poor. So, as well as working with the Met Office to develop a weather radar to help monitor the impact of the weather on the company's sewer network so that it can optimise the network and minimise energy use, NWL has also created the Northumbrian Water Globe Programme. This is an innovative and mutually beneficial way to get additional data from the conurbations. NWL has assessed where data is incomplete and given 85 free fully automated weather stations to schools in those locations. These transmit data to the company and are also used as cross curriculum tools in the school being used in geography, maths, information and computer technology. The schools that join the unique Project hub also join the international Globe programme so the data they collect is also available internationally to schools, scientists and NASA.

Northumbrian Water - Carbon Management

Many projects are underway to reduce Northumbrian Water's (NWL) carbon footprint and to educate employees and customers of the links between water and energy. NWL has comprehensive video conferencing facilities between its geographically diverse sites, most with dual displays to support the ability to show presentations / spreadsheets during video calls. Everybody is encouraged to use this equipment as an alternative to travelling and as a result, air travel between operational areas has reduced by approximately 40% since 2002.

The best carbon storage sink is blanket bog as when peat is wet it locks carbon in, preventing it being released in to the atmosphere. NWL is currently funding grip blocking work on blanket bog to enable it to work effectively again (historically many were deliberately unblocked by farmers). Wetter moorland also improves the habitat for a variety of wildlife, reduces soil erosion, and provides drinking areas for birds and livestock. The north Pennines AONB (area of natural beauty) has 27% of England's peat forming blanket bog and can, therefore, make a significant contribution to combating climate change. NWL is also working with Durham University to understand the hydrological carbon sequestration impacts of this.

Energy is vital to clean water, to deliver it to wherever it is needed and to treat it again after it has been used. NWL's demand for energy is largely dependant on legislation and the weather. Energy management is organised through the seven main strands that effect carbon emissions, each with strategies:

1. Physical efficiency (pumps etc),
2. Optimisation (networks, treatment processes)
3. Procurement,
4. Billing management/monitoring

5. Procedures and standards
6. Staff awareness
7. Renewable energy generation

NWL measures and has reduced its carbon footprint (measured at 259 kt CO₂e) as part of normal business, prioritising:

- a work management system using PDAs (personal digital assistants) reducing fleet mileage (pilot showed 34% reduction possible)
- reducing tertiary ultra violet disinfection out of season
- continue to send most sludge to beneficial reuse as a soil conditioner or as a fuel in cement manufacture whilst simultaneously developing and implementing a new sludge strategy. This will introduce an advanced sludge digestion process which would help power the plant at three smaller sites and two larger sites, increasing renewable energy by 20%. £32 million is being spent on process changes at Bran Sands to create the biggest single plant of its kind in the UK using the emerging new technology of thermal hydrolysis advanced digestion. It will reduce more than 500,000 tonnes of sludge from the treatment of domestic sewage and industrial effluent to about 60,000 tonnes and will generate 5 mega watts of green energy
- generating renewable energy from hydroelectricity and biogas combined heat and power (CHP).

NWL has been re-accredited for 2007 to 2010 for achievements in energy efficiency by the Energy Institute through the Energy Efficiency Accreditation Scheme.

Northumbrian Water – Flooding and drainage

Flooding from surface water and urban drainage in towns and cities currently costs the national economy £270 million on average each year but this could increase by up to £15 billion by the 2080's, if adaptation action is not taken. NWL has been leading one of Defra's Making Space for water projects which have been considering how to reduce the impacts of urban drainage flooding across England and how best to adapt to the consequences of climate change.

More intense and frequent rainfall events are expected and it isn't always practical or cost effective to build bigger and bigger sewers to take increased storm water. Add to this the increasing areas of hard surfaces, such as paving, which add to the speed and volume of water running off into the sewer and it is likely that increased flooding will occur.

Flooding of homes and businesses in towns and cities is typically due to a range of reasons. Some problems can be isolated to a single cause but usually it is a combination of factors that cause the worst flooding. Urban flooding is particularly challenging to manage because several different organisations are responsible for different aspects of the problem including water companies, the Environment Agency, local authorities and the Highways Agency.

The integrated urban drainage pilot project saw NWL working in partnership to develop solutions to help Government consider the best arrangements for reducing flood risk in towns and cities and provide new tools and techniques for mapping and managing surface water following heavy rainfall events and bring more clarity on responsibilities for those managing flood risks. The pilot set standards for others to follow nationwide and assisted Defra in setting best practice for dealing with this complex issue.

The 15 month study involved identifying which areas of Hartlepool suffer from surface water flooding, who is responsible and prioritising customers affected. The study involved hydraulic,

environmental, structural and maintenance investigations to enable solutions to be identified. By 2013 NWL will also have completed a major study on Tyneside to explore sustainable drainage options.

Northumbrian Water – Carbon calculator

NWL, operating in an area with adequate resources and also in one of the driest counties has been working hard with customers to show the very real link between water and energy. The web based Carbon Calculator helps customers to make that link for themselves as they see a personal carbon footprint of the water they use and are then shown where they can reduce their water carbon footprint.

Thames Water - Energy efficiency

Since the creation of an Energy Efficiency team in October 2006, many efficiency opportunities have been identified and implemented across the business. One example is the work that has been carried out on Thames Water pumps since 2005, the most energy intensive part of the business. Through comprehensive testing and refurbishment, this project has led to estimated reductions in Thames Water's greenhouse gas emissions of approximately 2,000 tonnes CO₂. By the end of the project, in 2008/09, the pump efficiency project savings are estimated to be in the region of 10,000 tonnes CO₂ - the equivalent of taking around 3,500 family cars off the road for a year.

United Utilities - Carbon and Sustainability Tool

United Utilities (UU) have developed an assessment tool, to assist in making their capital investment more sustainable and carbon efficient. The Carbon and Sustainability Assessment Tool (CAST) allows UU to compare different solutions in terms of the contribution over their lifetime to carbon emissions and overall sustainability. The tool was fine-tuned on the real life example of UU's sludge strategy, highlighting the option of maximising use of their existing sludge incinerator, rather than constructing an additional one. UU are starting to make use of this tool in planning for the next five-year investment cycle. UU are running the detail of bespoke solutions through the model to help in their decision making, and they are using CAST to generate carbon curves for more generic investment for use in the cost estimating stage.

United Utilities - Sustainable Communities

UU brought together a team with input from the Environment Agency and MWH, their capital programme design partners, to take a forward view of what utility provision might look like by the year 2050.

The approach taken was to look at two communities and analyse the current and likely future carbon footprint. Two scenarios were considered; one where the local utility company continues to provide services to customers much as at present and the other where the utility company works closely with the community to provide services and sustainable technologies to minimise carbon footprint. This second approach showed that a reduction of around 10% in the utility's footprint could be achieved through taking a collaborative approach and a further reduction of another 10% could be achieved by customers' actions. This translated to a reduction from an average carbon footprint of 6 tonnes per person per annum (t/p/a) to a revised value of 4 t/p/a. If replicated nationally this could provide a huge reduction in carbon footprint and at the same time contribute significantly to achieving sustainability goals.

United Utilities - On-line carbon calculator for customers

UU recently introduced an on-line interactive calculator which allows customers to understand how much water is used in their home, and where it is used. In addition, the calculator works out the carbon value of this water use (including energy used to heat the water where applicable) and

gives the customer an understanding of the degree of carbon emissions directly related to water usage in the home. This is then converted into metrics which customers can understand more clearly, for example the equivalent car mileage.

The calculator indicates whether the customer is a 'below average', 'average' or 'above average' user and then provides each customer with an individually tailored report identifying ways they can reduce their water usage. It also gives information on the level of expected saving, in financial, carbon and water usage terms.

To try the carbon and water calculator click here [Carbon and Water Calculator](#)

United Utilities - Carbon reduction

Since initiating work with the Carbon Trust in 2006 to calculate its emissions footprint and develop a carbon management strategy, UU has made considerable progress. UU's strategy is to reduce carbon emissions by 26 per cent by 2012 and activity has been driven by appointing the water sector's first fully dedicated carbon manager. Strategic action includes UU's performance in generating renewable energy, where the company has increased production year on year.

UU are investing £22m in extending their biogas-fuelled Combined Heat and Power (CHP) capacity by 80 per cent, which will provide renewable energy worth an additional 34,400 tonnes carbon dioxide equivalent (tCO₂e), delivering the majority of UU's targeted reduction in emissions related to their own activities. UU are pioneering new processes to maximise the potential for renewable energy generation. High Rate Enzymic Hydrolysis is a revolutionary new technique that they have developed in partnership with Monsal Limited to enable more efficient production of biogas. It has the added environmental advantage of making wastewater sludge safer for use as a fertilizer. The significance of this technology has been recognised by awards from the prestigious International Energy Globe, Institution of Chemical Engineers, Utility Week and a BiTC Big Tick.

Yorkshire Water - Energy use

Yorkshire Water has delivered a number of initiatives to reduce energy use including the development of the Water Resource Allocation Planning (WRAP) tool. The tool is used to optimise water production and bulk water transmission within the regional grid network. It has delivered an estimated saving of 5000 MWhs or 2615 tonnes CO₂e.

During 2006/07 Yorkshire Water successfully increased its renewable energy generation by 25%, enabling the company to produce enough energy to meet around 3% of its electricity needs. This in turn has helped Yorkshire Water to reduce carbon emissions by 7% over the last three years. Yorkshire Water have recently installed three new wind turbines at two sites, generating an additional 8500 MWhs per year and taking the total number of wind turbines up to seven. Yorkshire Water has also recently constructed a state of the art low flow hydro-electric device at the Esholt sewage treatment works, taking the total number of hydro-electric turbines to three. Furthermore, Yorkshire Water has 18 combined heat and power (CHP) plants across its sites and, as well as having a number of schemes planned for the near future, the company is currently installing five new units across the region, due for completion before the end of 2008.

Anglian Water - Energy Initiative

Anglian Water has been focusing significantly on improving its energy efficiency and renewable power generation through the formation of a new focused Energy Team and creation of the Energy Initiative. It has set an ambitious target to reduce energy costs by 20 per cent by 2010 (from the 06/07 baseline of 748GWh).

Saving Energy

Anglian Water's new Energy Team was created to focus the whole business on energy efficiency. The team has the following objectives:

- Develop energy strategies that fit with the corporate strategy
- Support the business in identifying opportunities to improve energy efficiency
- Manage the delivery of energy efficiency improvements
- Provide guidance to capital programmes
- Develop standards for the design and operation of energy-using plant
- Communicate best practice
- Maximise renewable power generation
- Maximise revenue generation capabilities from standing reserve
- Support the procurement of energy
- Provide appropriate information and incentives to increase the business appetite for energy efficiency
- Develop carbon management plan and practices

Through a series of energy audits on sites, Anglian Water's Energy Team identified a programme of work to improve the energy efficiency of equipment and processes at many of the company's operational sites.

Added value from the industry

Anglian Water - RiverCare Project

In conjunction with the environmental charity ENCAMS, Anglian Water has established a project called RiverCare which enables community groups to take an active role in improving the quality of their local waterside areas. The project has been running since 2001 and has been successful in increasing the number of active groups in the region. During 2007, volunteers collected almost 6,000 bin bags full of litter and pulled more than 200 bicycles out of the rivers in East Anglia. The scheme has also won a number of national and international awards for its sculptures used to highlight the scheme. These sculptures were made from recovered shopping trolleys from rivers. Following the sculpture media campaign, 36 RiverCare groups were active in the East Anglian region at the end of 2007.

Anglian Water - Education Programme

Anglian Water is taking a lead in the East of England in educating young people and the wider public about water issues, water conservation, climate change and the environment, making a real commitment to giving something back to the community. Business in the Community has recognised this awarding Anglian Water's education programme a Big Tick.

During 2007/8, more than 24,000 young people and 4,600 adults took part in education sessions at the two established purpose-built classrooms at wastewater treatment works in Essex and Bedfordshire and at Anglian Water's Mobile Education Centre (MEC). The MEC has had an overwhelming response since its launch in 2007 enabling Anglian Water to reach more young people across the region.

Yorkshire Water - Education

Yorkshire Water has three education centres, located across the region, at operational water treatment works. The centres educate primary school children about a range of topics closely linked to the national curriculum including water treatment, water conservation and the

environment. Primarily aimed at Key Stage 2, over 9,500 children and teachers visit the centres each year. During their visit, children are given an interactive adventure, based on the hugely popular Yorkshire Water educational CD-Rom, 'Baddies in the Works'. A tour leader will guide the children around the site, as they listen to a commentary through state-of-the-art headsets.

Yorkshire Water - Community involvement

Yorkshire Water's commitment to community initiatives has been rewarded with the Investing in Volunteers for Employers (iVE) quality mark, the only standard which recognises excellence in employer-supported volunteering. During 2007/08, 38% of Yorkshire Water employees (885 people) were involved in the company's in-house volunteering programme.

During 2007, Yorkshire Water launched its biggest ever volunteering campaign "One Million Green Fingers", which aims to create over 350 sustainable school gardens and utilise one million green fingers by 2010. The initiative provides children in Yorkshire with hands-on outdoor learning experiences in topical issues such as water conservation, sustainability, healthy eating, the environment and the food chain.

Yorkshire Water – Sites of Special Scientific Interest

Yorkshire Water's SSSI Recovery Project aims to persuade tenants to enter into agri-environmental agreements that will ensure all 11,500 hectares of its SSSIs meet the Government objective of having 95% of all SSSIs in "target" condition by 2010.

To do this, Yorkshire Water has undertaken ecological assessments on all its SSSIs and prepared Farm Management Plans that identify how the ecological, land use and water quality requirements might be delivered from an agricultural perspective, and the costs associated with this. Yorkshire Water has also assisted their tenants in making agri-environmental scheme grant applications and has started major capital restoration works. Behind this, Yorkshire Water has engaged with tenants, agents, third party interests and a wide range of stakeholders with an interest in SSSIs or other aspects of land management.

Dwr Cymru Welsh Water - Education Strategy

Dwr Cymru Welsh Water has a part to play in helping customers to understand how they can help and protect the environment. Dwr Cymru Welsh Water's four education centres visited by over 14,000 children every year discover the vital role water plays in our everyday lives. At the centres there's a wealth of interesting information and resources all linked to the national curriculum and developed with educational experts to stimulate and educate the curious minds of the key stage pupil. This will continue to be an important part of Dwr Cymru Welsh Water's business and their education programme which form part of the 'Be Waterwise' campaign.

The four centres are located throughout Dwr Cymru Welsh Water's operational area in Elan Valley nr Rhayader, Cilfynydd nr Pontypridd, Cog Moors nr Dinas Powys and Alwen in the Denbighshire moors. The centres run a range of fun, practical activities and programmes so children can experience the world of water at firsthand. All lessons are led by specialist teaching staff, in fully equipped classrooms, and are all linked to the National Curriculum for Key Stage 1 and 2. There are over 10 different activities to choose from which all include key core business messages and sustainable and environmental themes.

The Education Strategy has been successfully in place for over 5 years and has won several awards for its education provision. The most recent being the Silver Jubilee Big Tick Award for its long term commitment to education support for the communities it serves. This special Jubilee award in celebration of BITC's 25th anniversary of its founding, recognised companies whose programmes have delivered a long term positive impact over ten years or more.

Dwr Cymru Welsh Water - Water in the School Website

As a result of the success of the water in the schools website the UK Education forum, which includes representatives from 13 UK water companies, has contributed to the development of a new website ['The Water school'](#), this went live in March 2007. The site was developed by Crystal presentations and trialled by teachers linking it to the National Curriculum. During the year there have been 24,770 hits to the website.

Dwr Cymru Welsh Water - The Water Family Website

[The Water family](#) website has been established for over 2 years and had 231,402 visitors during the year.

Dwr Cymru Welsh Water - Keep Wales Tidy Partnership

DCWW in partnership with Keep Wales Tidy have developed a water efficiency pack to help schools use water more efficiently. The bilingual pack called 'Water is Cool – Respect it' was distributed to Silver level Eco Schools in Wales during the summer term 2007 and will continue being distributed as and when schools achieve Silver status. To date 753 packs have been distributed.

The pack illustrates how important water is to each of us and helps children understand the value of water and the vital role it plays in our everyday lives. It contains lots of interesting facts on how to use water wisely and schools can use the pack as part of the Eco Schools programme or as part of an independent water conservation project. The pack consists of posters, 'watery' splash shaped stickers and fun footprint which can be splashed over the toilet walls and doors or other display areas to get the water efficiency message across.

Welsh Water has contributed to the Eco schools handbook (water section), whereby schools have to complete and be assessed on 7 elements of the programme to become a Green Flag school. Water efficiency is one of the 7 elements. There are over 1500 schools registered with Eco schools in Wales who have all received the handbook.

Dwr Cymru Welsh Water - National Eco Award for Water Efficiency Competition

To reward schools for the good practice they have adopted through water efficiency in schools, Welsh Water in partnership with Eco schools held a National Eco Award for Water Efficiency for schools who have achieved Green Flag status. The competition was very well received and the winning school Cadle Primary school in Swansea were the proud recipients of a £500 cheque and trophy. The Head teacher from the school said *"Everyone at Cadle is very pleased and proud to have won the National Eco-award for Water Efficiency sponsored by Dwr Cymru. Dwr Cymru Welsh Water have worked very hard to help us learn about where water comes from, how important it is in our lives, and why it is important to save as much water as we can. We have fitted low volume flush toilets and push taps in our toilets and our 'Don't be a drip - save every drop' campaign helped highlight water efficiency in school and at home. The Eco-committee is already discussing with their classes how they would like to spend the prize money (A job they are very happy to do!) Ideas so far include more water butts, putting a water feature in our new wildlife area and books about the environment. The trophy and certificate have pride of place in the entrance of the school so that all the children, parents and visitors can acknowledge and appreciate this wonderful achievement."*

Dwr Cymru Welsh Water - North Elyri Mor and Anglesey

Following on from the North Elyri and Anglesey schools pilot being identified last year, loggers have been installed at the schools and data is being collated. Aqualogic installed the water efficiency devices agreed in the audits during the Summer term. 10 Primary schools and 10

Secondary schools were chosen to take part in the pilot project. By taking part in this project the schools will enhance the curriculum, conserve water and save money for their schools. A presentation day is planned for the Autumn term to give schools the opportunity to display their presentations on the good practice being adopted at their schools. A final report will then be collated to show how much consumption has reduced as a result of the installation of the water efficiency devices.

Dwr Cymru Welsh Water - Appointment of the Peripatetic Education Officer

DCWW has appointed a peripatetic teacher to deliver Water Efficiency lessons at its Education Partner sites. It is currently working with four key organisations – The Hereford Waterworks Museum, The national Botanic Garden of Wales, WWT National Wetland Centre Wales and Techniquet. There are over 500 primary schools in these areas who don't currently visit any of the company's education centres. These programmes offer a range of activities to schools that are unable to visit one of the sites. DCWW are delivering Water theme weeks at these sites to enhance the educational experience on water efficiency to a percentage of these schools. It has developed a range of new experiences that bring a world of water learning to pupils through partner sites. Since the Peripatetic Education Officer was appointed over 2,800 pupils have received water efficiency messages through partner sites.

Dwr Cymru Welsh Water - Our Education Partners

Hereford Waterworks Museum

Visiting pupils discover the history of the water industry through innovative educational facilities and working engines, such as a beam engine, the largest triple expansion steam engine in Britain, and modern multi-stage electric turbines. DCWW's Peripatetic Education Officer runs educational activities at the museum and currently offers a newly developed programme Water and the Waterworks for visiting school groups. The programme lasts a full day and includes practical activities such making a water filter, pond dipping, an outdoor water efficiency trail and a tour of the museum.

The National Botanic Garden of Wales

The Dwr Cymru Welsh Water Discovery Centre at the Gardens runs a range of curriculum-linked programmes. Each one helps children aged 3-19 understand the relationships between water and plants. The gardens also offer a full programme of courses for teachers. The newly appointed DCWW Peripatetic Education Officer has developed a new lesson called 'Water Matters' which explains the importance of water efficiency at school and at home in a practical and interactive way. This programme is particularly useful for schools wishing to implement the water element of the Eco schools programme.

WWT National Wetland Centre Wales

Children visiting the popular WWT National Wetland Centre Wales can now explore different ways we use water in our everyday lives. The indoor 'Water for Life Discovery Centre', which Welsh Water developed with the NWCW, is full of fun activities, exhibits and models. Tailored programmes are available for children from nursery to sixth form, including special needs pupils. The peripatetic Education Officer also runs activities weeks throughout the year at the Centre. The latest programme to be developed is 'Wetland Waters' which is an in depth look at how the Millennium Wetlands were created in partnership with Dwr Cymru Welsh Water. Pupils learn about how dirty water is cleaned and make their own water filter. They spend time in the DCWW Herons Wing Hide identifying the birds using binoculars and ID guides. A water efficiency trail around the water for Life house delivers the vital message of water efficiency in a fun and interactive way.

Techniquest

An interactive water efficiency display awaits children who come to Techniquest, as do 160 hands-on exhibits, a science theatre, planetarium, lab and discovery room. Techniquest runs 60 different school workshops and presentations during term time for early learners to 16+.

Dwr Cymru Welsh Water's Peripatetic Education Officer works in conjunction with Techniquest staff on certain dates throughout the year. This academic year the education officer will be working alongside Techniquest staff during World Water Week in March to share practical lessons with pupils on the vital role of water and how to use water sensibly.

Dwr Cymru Welsh Water - Outreach Program to Schools

Currently over 14,000 pupils visit one of Welsh Water's 4 education centres. As an additional service DCWW's seconded teachers are targeting 60 new schools throughout its operational area to promote an after school activity on Water Efficiency. This will enhance the curriculum links currently delivered at the education centres and extend out to schools.

Dwr Cymru Welsh Water - Water Efficiency Calculator

To support the water efficiency activities being delivered at education centres and during outreach, DCWW have developed a water efficiency calculator to help pupils understand how much water they use in a day. The calculator is given out to pupils after each visit to one of the centres and is also available on line for them to calculate their usage. The aim is to educate youngsters on how much water they use and whether they use water responsibly. Welsh Water's message is use as much drinking water as you need but don't waste it.

Dwr Cymru Welsh Water - Water Treatment DVD

Welsh Water has produced a new DVD available this year to schools in Wales on the water treatment process. Key water efficiency messages are included in the DVD to educate youngsters on the importance of saving water. These messages fit nicely with the new curriculum which is coming to Welsh schools in September 2008 on Education for Sustainable Development and Global Citizenship.

Northumbrian Water - Working with universities

The Newcastle Business School, part of Northumbria University, has launched a bespoke leadership and management degree programme for employees at Northumbrian Water as part of the organisation's ongoing commitment to developing the skills of its management team.

The new BA Hons degree, officially endorsed by Dean of Newcastle Business School, Paul Croney, and John Cuthbert, managing director of NWL will be delivered in block stages over three years, ensuring time out of the business is minimised and application to the workplace is maximised.

Newcastle Business School began working with NWL in May 2007 developing a Masters in leadership and management for its senior managers. The programme, which sits within the executive development portfolio, focuses specifically on the practical development of senior leaders within organisations and includes executive coaching, which enables leaders to ground their personal development into the leadership role.

The new BA Hons degree forms part of a wider leadership and management framework developed in line with NWL's strategic people plan.

Essex & Suffolk Water - Layer Treatment Works

Employees at Layer de la Haye treatment works realised that too many lights were left on overnight so they came up with a few ideas to reduce energy wastage and help the environment.

Gary Banks, the treatment works manager said: *“The problem with a large works is that it’s difficult to have one person responsible for making sure all lights are off at the end of the day. We had to make it everyone’s responsibility, a real team effort, to change current behaviour. For this to happen, everyone had to have the same level of knowledge. It had to be easy to identify the location of light switches as well as which ones had to be left on for health and safety reasons.”*

An audit of all lighting in the works was carried out to find out how many lights could be switched off. The survey also noted that some strip lights could be replaced with new tubes that emitted the same level of light, but used less electricity, making even more savings.

A system was created so that light switches could be easier to identify. Martin Measor explained *“To make identification simple we produced coloured surrounds for each switch. We used a colour coded system with green for switch off and red for leave on. This makes it easy to identify the location of switches and everyone instantly knows which lights can be switched off without causing problems to the works.”*

These small measures have resulted in CO₂ to the equivalent of a hatchback car being driven eight and a half times around the M25 motorway being saved at the treatment works each night.

United Utilities - Sustainable Catchment Management Programme (SCaMP)

UU is three years into its ambitious five-year programme of improvements to the catchment land that we own in Bowland and the Peak District.

The aim of the £10m programme is to improve the condition of the land, the wildlife habitats on it and the quality of the raw water that runs off it into UU reservoirs. UU is now implementing the farm plans which lay-out all of the work required to ensure that we move to a farming system that is both environmentally and economically sustainable. The plans are done, the negotiations are largely complete, and most of the government grants are secured, so work on the ground is now underway.

UU has planted over 250 hectares of woodland, blocked over 30 kilometres of moorland drains, started to re-vegetate over 60 hectares of bare peat, built or improved six buildings with lots more to come. For the land designated as sites of special scientific interest (SSSI) that was in the worst condition, UU has, through the work already undertaken, moved around 80% into favourable or recovering position.

United Utilities – Environmental stewardship in Bowland

Catlow Farm is the largest holding on UU’s estate in the Forest of Bowland, Lancashire, comprising over 1,000 hectares of heather and grass moorland rough grazing and in-bye land. The tenant at Catlow Farm has been involved in the SCaMP programme since 2006 and an England Woodland Grant Scheme (EWGS) application was submitted on their behalf followed by a Higher Level Scheme (HLS) environmental stewardship application.

The HLS included bringing all the species-rich grasslands, hay meadows and woodlands on the farm into appropriate management, designating areas for the management of rough grazing for wading birds and entering the moorland areas into moorland restoration.

The EWGS scheme targeted areas on the farm where the planting of new native woodland would have maximum benefit in terms of creating new wildlife corridors and habitat and improving and protecting the quality of the water flowing into Stocks Reservoir. In early 2007 the first of these new woodland areas was created with the fencing out of the watercourse in Hasgill Beck. This was then planted up with a mixture of Oak, Ash, Alder and Holly by the farming tenants working closely with UU's Woodland Officer.

The second area targeted for EWGS new native woodland creation is to the North of Catlow itself in the area known as Kearsden Holes. This area is currently dominated by several blocks of conifers, planted since the 1950s but with no viable extraction route these blocks of conifer stand out in stark contrast to the whitemoor which surrounds them. The new native planning scheme will buffer the edges of these conifer blocks with the rounded shapes and mixed colours of broadleaved woodland whilst also protecting the water which flows from the cloughs in this area into the River Hodder and subsequently into Stocks Reservoir. The planting which extends up the cloughs will also have the added bonus of adding diversity to the bracken covered slopes which currently have limited wildlife benefit.

There are eight farm buildings being erected on the Bowland Estate and one traditional barn at Catlow Farm to be restored and altered to facilitate modern farming practice under SCaMP.

Other farms are benefiting from covered yards or general purpose portal frame buildings to enable the livestock to be housed over winter as well as accommodating lambing and calving indoors where land is subject to stock exclusion at certain times of the year in order to comply with the Higher Level Stewardship Scheme Management Prescriptions and the implementation of SCaMP.

United Utilities – Woodland management approach

Whilst the primary purpose of UU's woodlands remains the protection of raw quality, company plans to move towards mainly broadleaved deciduous native species also integrate opportunities for enhancement of biodiversity and compatible access and recreation. The lake shore project at Thirlmere is a good example of this.

Working with tenant farmers through the SCaMP programme, UU has created significant new areas of woodland, the first for many years. So far UU has planted 250 hectares of mostly upland oak woodlands which have made a major contribution towards regional biodiversity targets.

Production of timber is not the main objective, but UU does seek to maximise the opportunity to offset catchment management costs through sale of timber where this is appropriate. UU is keen to promote the utilisation of low grade timber as a source of woodchip fuel, but the market for this is still very undeveloped.

Essex & Suffolk Water - Partnerships

ESW funds 6 partnership posts through Essex Wildlife Trust, the Broads Authority and the Davy Down Trust. 4 of these are focussed on site management, whilst two are on management within the catchment. The aims of the partnerships are to deliver work that contributes towards biodiversity targets, to help restore land back to favourable condition and then maintain it in that state, to help deal with water quality issues and to allow others to enjoy access to sites.

ESW has also developed an initiative called "Branch Out" involving a series of projects to help restore ecological connectivity within the region. One example is "A Living Landscape for the River Waveney" with Suffolk Wildlife Trust. The company is also working with Essex Wildlife

Trust, Norfolk Wildlife Trust and the RSPB to look at other areas where working together could help generate change at a landscape scale.

ESW is an active member of the Essex BAP project and is restoring a reedbed site at Hanningfield Reservoir SSSI - historically the site was used as a disposal site for sludge from the water treatment works and had dried up over the last 20 years since it was no longer operational. ESW has carried out extensive scrub removal, will create a series of ditches and channels in between the areas of open water and has laid a new pipeline to ensure there will be a constant flow of water through the site even during dry periods.

Thames Water - £10 million Ten Point Plan

Thames Water has established a £10 million Ten Point Plan to benefit disadvantaged customer and communities, funded through company profits. Half of the money available will fund an independent charitable trust to assist the small number of customers who are genuinely unable to pay their water bills or who have suffered particular hardship as a result of water or wastewater incidents. The other half of the money will fund a wide range of initiatives that deliver things that Thames Water customers have said are important to them, but which fall outside – or go beyond – meeting Thames Water’s regulatory obligations. These include increasing educational and community activities, improving public access to Thames Water sites, investigating cutting-edge water efficiency opportunities, and assisting disadvantaged students to become engineers.

Thames Water - Flagship educational resource ‘Network Challenge’

In 2007/08, Thames Water ran ten Network Challenge events across its region, where students from various secondary schools work in teams and learn about the business of supplying water by building their own water network. The tasks, time pressures and shifting environment of the challenge bring to life the breadth of skills that are needed to be a modern water engineer. The aim is to educate students about the water network so that they can take home these important messages and encourage them to think about a career in engineering to lessen the skills shortage in this key area.