



Our long-term strategy

2015 – 2040



Introduction

Contents

- Page 4**
Our strategy in brief
- Page 6**
Listening to customers and stakeholders
- Page 10**
Our customer service strategy
- Page 14**
Our water resources strategy
- Page 18**
Our water treatment strategy
- Page 20**
Our water distribution strategy
- Page 22**
Our wastewater collection strategy
- Page 24**
Our wastewater treatment strategy
- Page 26**
Our sludge treatment and disposal strategy

This strategy describes the course that Thames Water has set itself for the next quarter of a century, to 2040. No-one can know what the world will look like over that period, though it is safe to assume that the provision of water and effective collection and treatment of wastewater will continue to be highly important to the citizens of London and the Thames Valley, and that affordability and good service will remain a priority for those who pay the bills.

It is six years since we last published a strategy document and we believe the time is right to update that statement of how we plan to navigate our business in the future. This document also provides the long-term context for the five-year business plan submitted to Ofwat in December 2013.

Martin Baggs
Chief Executive Officer



Forming the foundations of our strategy

Our desired customer experience is that “Customers choose Thames Water because they trust us, we are easy to do business with and we really care.”

As a starting point for our plans for the next 25 years, we need to determine the outcomes we will deliver. These are the essential long-term services and benefits we will provide for our customers. They form the basis of the measurable

objectives for our five-year business plan for 2015-2020 and for subsequent plans beyond.

We have set these outcomes in light of extensive engagement with a wide range of our customers, including our research and consultation activities, through which we have built up a detailed and well-evidenced view of what customers want and what they are willing to pay for.

In light of this understanding of our customers’ wants and needs, we have defined the following six outcomes:

- We will provide a safe and reliable wastewater service that complies with all necessary standards and is available when our customers require it.
- We will demonstrate to our customers and stakeholders that they can trust us, that we are easy to do business with and that we care.
- We will provide the level of service our customers require, in the most economic and efficient manner, to ensure their bills are no more than necessary.
- We will limit our impact on the environment, to achieve a socially responsible, sustainable business for future generations, including reducing levels of leakage.
- We will provide our customers with a choice of easy-to-use contact options
- We will provide a safe and reliable water service that complies with all necessary standards and is available when our customers require it.



Our strategy in brief

Our strategy looks to address the challenges we will face in the 25 years to 2040.

We anticipate that our role will always be to provide our customers with clean, safe drinking water and to recycle their wastewater safely to the environment. In doing so we will deliver standards of service that meet customer expectations and are affordable, we will comply with all the applicable regulations, and we will regard the health, safety and well-being of our staff and contractors as an absolute priority. The other main elements of our strategy are set out below, with further detail and explanation in the remainder of the document.

Customer service strategy overview
The majority of our customers only need to make contact with us to pay their bills, to tell us they are moving or to update their account details. We will save time, cost and confusion by making sure our bills are easy to understand, accurate, and easier to pay, with simple and secure online account management and an increased range of available contact options for our customers.

When customers do need to contact us – for instance, to report a problem with their water supply – we will place a higher priority on getting things right first time and communicating effectively at every stage.



To help improve satisfaction and reduce complaints, we will continue to invest in staff training and new technology.

Affordability will be as high a priority for us as it is for our customers. We will introduce a means-tested social tariff and continue with other tried and tested ways to help our most disadvantaged customers. We will provide access to frequent consumption data so that customers can choose to manage their usage and their bill through ‘smart’ metering technology. We will also provide water efficiency advice to help customers to reduce consumption and to manage their bills.

The costs of non-payment of bills are ultimately borne by the customers who do pay. This is an inequitable situation which we will endeavour to mitigate and reduce as much as possible. We will use technology to help us segment customers and capture information about their payment behaviour and their respective abilities to pay, so that we can target the right type of collection activity.

Water supply strategy overview
In meeting the need for water the priority for us and our customers will always be to manage demand through reducing leakage, metering supplies and actively encouraging the wise use of water. We will improve our ability to manage demand by developing greater real-time intelligence about the performance of our water supply network, through metering of customers and monitoring of key mains. If and when this approach is either insufficient, or does not represent best overall value, we will develop new supply resources.

We will become a fully-metered business, using ‘smart’ meters. By 2030 at the latest all business and residential buildings will be metered. Where it is not practical to install meters for individual households, we will fit a bulk meter to each building, in order to achieve a comprehensive understanding of how our network is operating. This is essential in order to target leakage, an issue that our customers have told us is a priority for them, and to prioritise management activities efficiently.

We will play a full part in identifying the best long-term package of measures to supply the south-east of England, including potential new connections between our neighbouring companies to allow for trading of water supplies into our region.

We will continue to study the three main options that have been identified for a major new water resource, likely to be needed in the late 2020s: a new reservoir, wastewater recycling in London, and long-distance water transfers. Each has advantages and disadvantages and we need to examine them carefully, as well as being open to innovative solutions that are likely to become available in the future.

We will improve the capacity and reliability of our major water treatment works and continue to aim for 100-per-cent compliance with drinking water quality standards.

From 2015 we will commence a structured programme of monitoring and, where necessary, replacing and rationalising trunk mains – the large mains, operating under high pressure, that form the main arteries of our system.



Future structure

Wastewater treatment strategy overview

We will play our full part in ensuring the delivery of the Thames Tideway Tunnel, meeting all project milestones. This will prevent virtually all of the discharges from London’s overloaded sewer system to the tidal River Thames, significantly reducing pollution into the tidal Thames from about 2023.

We will continue to give priority to reducing sewer flooding and maintaining river water quality, in line with customer expectations. In managing our sewerage network we will look for innovative and cost-effective ways to limit the volumes of rainwater entering the sewers, including working more closely with partner organisations such as local authorities and regulatory bodies. This will help reduce the risk of sewer flooding of homes and gardens, and of discharges to rivers and streams from combined sewer overflows. Sustainable drainage must be built into new developments and given careful consideration as a retro-fit option elsewhere.

We will steadily increase our use of real-time control and monitoring systems. This will improve our management of the network and the speed and effectiveness of our response to potential operational problems.

Most cases of pollution from our sewers are a result of hydraulic incapacity caused by high rainfall, poor operation or blockages caused by incorrectly-disposed material such as cooking fat and oil. Severe pollution incidents relating to our treatment plants are rare but when they do occur they can have short-term devastating consequences to river life. We will continue to target full environmental compliance at all our sewage works and zero pollution incidents from our network. This will include continuing to work with the Environment Agency to identify pollution from households and businesses with misconnected drains.

Large parts of our sewerage network can be affected by high groundwater levels and infiltration following prolonged rainfall. This was demonstrated in 2012/13 following prolonged heavy rainfall. In the next five-year period we intend to carry out targeted investment to reduce this issue at 15 separate locations.

We will work towards generating renewable energy from virtually all of the sewage sludge produced at our works and steadily improving the efficiency of generation, through the use of emerging technologies such as thermal hydrolysis and pyrolysis. Innovation will continue to play a major part in reducing our energy consumption, as it will in reducing the amount of energy required in aeration lanes, currently the most energy-intensive part of our treatment processes.

There have been significant changes in the world of regulation, notably Ofwat’s requirement that we submit separate business plans for our wholesale and retail functions as part of the 2014 Price Review. There are also changes in the competitive market, with large business water users already having the opportunity to switch suppliers and further changes expected in 2017. It is possible that the water industry may in the future develop along similar lines to other UK utilities markets, with household customers (as well as business users) being able to switch their supplier.

We need to consider our organisational structure to ensure we are able to respond in a creative way to the diverse issues facing us. We believe our business will need to re-organise over time from our current centralised structure into four separate businesses. Each will have their own managing director and senior leadership team, able to focus on its own specific issues, assisted by a central support services unit:

- Retail household: provides customer-facing activities such as billing and revenue collection
- Retail non-household: responsible for all aspects of retail service delivery to all business customers
- Water services: responsible for all aspects of water abstraction, treatment and distribution
- Wastewater services: responsible for all aspects of wastewater collection and treatment to environmental standards
- Central services: responsible for shared services across the water organisation, such as financial control, human resources and strategy and regulation

The change to this operating model should lead to efficiencies through the targeted accountabilities of each area, and the ability of each business unit to adopt an appropriate structure, culture and decision-making processes to deliver its business plan as effectively as possible.

We have already started the devolution of centralised decision making, most noticeably by appointing chief finance officers for our operations and customer services departments.

We are developing a detailed proposal and implementation plan, and are committed to structuring the company in the most appropriate manner to deliver our long-term strategy as efficiently and effectively as possible.

Listening to customers and stakeholders

It is important that we understand the views of the wide range of people we serve, before deciding our plans for the future.

In July 2013 we began a public consultation, in conjunction with our draft business plan and water resources management plan. This asked customers, stakeholders and staff for their views on whether our long-term strategy focused on the right areas.

More than half of respondents (57 per cent) agreed that it did. Agreement was significantly higher than the average among staff, of whom two-thirds (66 per cent) felt the draft long-term strategy focused on all of the right areas.

Customer Challenge Group

To help with the development of our five-year business plan, we have shared our proposals with our independent Customer Challenge Group. The members include regulators and representatives from the Consumer Council for Water, local

government, organisations such as Age UK and large and small business customers. The group's role has been to ensure that we have engaged effectively with our customers to understand their preferences and priorities, and that we have taken them into account in forming our plans. The group has met regularly to study the detail of our proposals, and to check that we have been testing these properly against customers' views.

We have also set up a forum to obtain regular feedback from our commercial customers. This includes representatives from a cross-section of businesses.

Both of these groups have also been consulted in the preparation of this long-term strategy and have provided valuable challenge and guidance.

Long-term challenges

Before setting out our strategy in detail, it is important to identify the most significant challenges we expect to face over the next 25 years and beyond.

Here we summarise some of the major issues we need to consider in our long-term planning.

Affordability

Our work is ultimately paid for by all of our customers and has to remain affordable. It is impossible to predict how the economy will perform in anything other than the short term, although we are anticipating a slow recovery in the next five-year period, so we must take a conservative view of what will be affordable at any point in the future. However, our customers have always taken the view that we should not pursue short-term gains in affordability at the expense of longer-term pain.

There are some improvements which we need to make to comply with the law. These include building the Thames Tideway Tunnel, which is badly needed - as well as being a legal requirement - but will cause a significant rise in our wastewater charges.

Customer expectations

The level of service that customers expect of us is rising and this trend is likely to continue, driven by expectations set in the wider economy. All business customers will be able to choose their supplier from 2017. We will need to be able to meet their needs with a range of value-added services.

Population growth

The population in our water supply area is projected to rise from 9 million to 10.4 million by 2040. This will increase demand by between 230 and 340 million litres per day, with about 80 per cent of this rise expected in London.

The population in our wastewater area is also forecast to rise from 15 million to 18 million over the same period. This will put more pressure on our sewage works and increase the volume of sludge we will need to treat and recycle.

A related challenge comes from new homes and the consequential loss of green space to absorb rainwater. In the absence of additional counteracting measures, this tends to increase the amount of rainwater that runs into our sewers. Housing developments near our sewage works could also require additional measures to reduce odour.

Climate change

The latest official predictions lead us to expect, on average, that summers will become hotter and drier, leading to increased demand for water. By the 2040s, average summer rainfall could be reduced by 13 per cent.

Winters are predicted to become generally wetter, with more intense storms. This will put additional pressure on our sewer network and increase the risk of flooding from it. By the 2040s, average winter rainfall could increase by 12 per cent.

Overall, it therefore seems likely that average rainfall over the course of a year will be largely unchanged. It is the timing and intensity of the rain that will be significant and that we need to look at most closely.

New laws and regulations

Legislative changes could impose additional demands on how we operate, or even make life simpler. In this respect we have to base our strategy on what we know today.

Implementation of the EU Water Framework Directive, which seeks to improve the quality of lakes, rivers and streams, could require us to make major changes at our sewage works, to reduce levels of phosphorus, nutrients and metals discharged into rivers in treated effluent. This could increase our use of energy and chemicals. The Directive, and other environmental requirements, could also reduce the amount of water we are allowed to take from rivers and boreholes, by up to 179 million litres per day.

Other changes will make it easier for businesses to switch service provider, and for new companies to enter the market. In the longer term, household customers might even be able to make this change.

Ageing equipment

Some of our equipment, although working well at present, is nearing the end of its life, putting it at higher risk of failure and increasing maintenance requirements. We will face a greater number of decisions about when and where we should replace equipment. This will require the best possible understanding of the rate at which our assets deteriorate and the effect on customer service, so that we strike the right balance between the risk of failure and the cost of replacement.

Rising energy costs

Electricity prices are predicted to rise steeply in the coming years. Government forecasts suggest an increase of around 40 per cent in real terms by 2030. This will have a significant effect on the costs of pumping water and wastewater around our 5,000-square-mile region. The price of the chemicals we use tends to rise in line with energy costs and rising road fuel costs will change the economics of recycling treated sludge to farm land. More positively, the value of our renewable energy generation will increase, which will give us greater opportunity to maximise our own generation capacity.

Skills, education and employment

Recruiting, training and retaining staff with the skills and motivation to deliver our plans effectively is a continuing challenge. The average age of our workforce is increasing and to attract the best possible successors we will need to continue to adapt our recruitment to changing needs, with particular emphasis on the graduate and apprentice programmes which have served us so well in the past.



Our customer service strategy

We aim to provide a top-class service for customers, and at an affordable price.

Facts and figures

- We currently receive over **3.5 million** telephone calls per year and more than **0.5 million** written enquiries, including emails and web forms.
- We directly bill **4 million** properties per year.
- In addition to our domestic customers, we serve around **250,000** businesses.

We provide the most basic and the most essential of all services. Our customers expect to be able to trust us to do that with the utmost reliability. They also expect us to make things easy for them and to show that we care about them.

Our strategy is to make improvements in all these areas, while ensuring that bills are affordable.

The principal contact with our customers comes when they pay their bills, tell us they are moving or update their account details. We will save time, cost and confusion by making sure our bills are easy to understand, accurate, and easier to pay. Our recent bill re-design has been well received but we need to continue to improve, particularly in helping metered customers to monitor and understand their water use.

An increasing number of customers prefer to pay their bills online and we will continue to develop this option and further enhance our customers' online experience, while maintaining traditional methods for those who prefer them. Online account management also offers other opportunities to increase convenience, and we will continue to keep pace with new technology, so that we can offer all of our customers the options that best suit their needs. This includes developing full self-service online account management and web-chat options. In order to ensure that our services are efficient we need to make sure that the most cost-effective ways of contacting us are also the most attractive. Our other contacts with customers

are usually when there has been a problem of some sort with our service. In these circumstances we now ask for feedback afterwards. The results have been enlightening and have allowed us to make targeted improvements in communications, processes and staff training.

The average customer satisfaction score (for Thames Water overall) from this feedback has improved steadily and now stands at around 4 on a scale of 1 to 5. At the same time the number of complaints has fallen significantly. We therefore intend to continue with this practice, as a matter of course, analysing the results weekly. By seeing things from our customers' point of view, and taking action immediately, we can make continuous improvements in the areas that matter most.

When customers are dissatisfied it is usually because we have taken too long to resolve things, have not kept them informed of progress, or have failed to keep our promises. We know that we need to do better in all these areas. Our approach will include continuing to invest in training front-line staff, to help them get things right first time, and as quickly as possible. We realise how important it is that our bills remain affordable. We aim to address this in a number of ways, including looking at a new means-tested social tariff to assist those households who most need help in paying their bills. Our research on the social tariff has shown that 64 per cent of customers accept up to a £4 subsidy on their bills to assist those in most financial need.

We will explore other ways we can help, including providing assistance to all of our customers to help them save water. We will continue to actively promote the WaterSure scheme, which helps metered households who receive benefits and either have a large family or someone with a medical condition requiring extra water use.

Non-payment of bills is a major problem and particularly serious because the costs of those who do not pay add significantly to the charges of those who do pay. We are reviewing our processes and will test new ways to ensure that households who can pay us do so, and that those who genuinely cannot afford to pay receive the help they need. This will include working with the Government and other agencies.



Business customers

Unlike domestic customers, businesses in England using 5 million litres or more of water per year can currently switch their provider for water retail services. Planned changes to legislation will extend this choice to all business customers, for both water and wastewater retail services, by April 2017.

We want to be the natural choice for business customers for water and wastewater services nationally. Our strategy focuses on three key areas:

- **Getting the basics right:** Ensure we consistently deliver our core water and wastewater services to a high quality. We aim to provide regular, accurate bills so businesses can understand and control their costs. To help achieve this, we will fit 'smart' meters that provide data on water consumption, and introduce innovative tariffs to encourage efficient water use.
- **Putting customers in control:** Offer a range of additional products and services to support customers with effectively managing water and wastewater on their sites and in their premises.

- **Being a trusted advisor:** Work with customers at a strategic level, bringing our skills and expertise in water, waste, energy and carbon management to help deliver their sustainability objectives.

The business market is changing - therefore, so must we. This is an exciting prospect and we recognise we must adopt a new attitude if we are to compete in a new market. We are actively engaged in the competitive market outside the Thames Water region through the establishment of a dedicated team in Thames Water Commercial Services Ltd, which holds water supply licences for Scotland, as well as England and Wales. We have already achieved success by securing retail customers in the Scottish market.

Our standard water and wastewater services differentiate themselves on price and quality of service. This includes monthly meter readings, a flexible billing format and payment terms. However, they go beyond that, providing a one-stop shop for all water and wastewater services. These include finding and fixing leaks, offering accreditation to the European Water Stewardship scheme and the collecting and treating waste materials.



Our water resources strategy

It’s vital that we plan ahead, so that our region always has enough water to go round.

Facts and figures

- We supply around **2.6 billion** litres of water to **9 million** people across London and the Thames Valley.
- Our region covers about **5,000** square miles and includes a large part of south east England.
- In the capital, most of the water we treat comes from rivers, while outside London the majority is pumped from underground aquifers via boreholes.

We have a statutory duty to provide reliable supplies of safe drinking water to all our customers. We have to do this with as little impact as possible on the environment, meeting the needs of a growing population, adapting to a changing climate and keeping bills affordable.

Our strategy is to manage demand to the greatest extent possible, including:

- Making further reductions in leakage
- Moving progressively to becoming a fully metered company, and
- Actively promoting the wise use of water by our customers.

Since, on current projections, this will not be sufficient to bridge the gap between supply and demand in the longer term, we will also, where necessary, develop new water resource options that provide overall best value for customers and the environment in the longer term.

Pressure on our region’s water resources is already significant. The balance of supply and demand in our largest water resource zone, London – which serves three-quarters of our customers – is finely balanced.

We boosted local resources in 2010 by opening the UK’s first large-scale desalination plant in east London. In

times of drought or other emergency, this enables us to take water from the tidal Thames and remove the salt in order to provide drinking water. However, there has been no major increase in reservoir storage facilities in this part of our region since 1974, when we opened the Queen Mother Reservoir in west London. Our main focus since then has been to make the best use of what we have – for example, by reducing leakage – together with developing new, local resources, where practical.

Looking ahead, we forecast a growing deficit in this zone, increasing from a predicted two per cent (or 125 million litres per day) by 2015 to 16 per cent by 2040 – equivalent to a gap of 367 million litres per day, or the daily needs of more than 2.2 million customers.

Our second largest zone, Swindon and Oxfordshire, serves nearly 1 million people and is predicted to have a deficit of four per cent – or 14 million litres per day – at times of highest demand by 2039/40. There have been no major increases in available storage facilities here since Farmoor Reservoir, near Oxford, was built in 1967.

Our other zones are forecast to have sufficient resources over the next 25 years, based on current estimates of population and available water.

Reducing leakage
Since 2005 we have reduced leakage by 26 per cent, by reaching seven successive annual targets agreed with Ofwat. We recognise that the leakage targets included in our draft long-term strategy were not sufficiently ambitious. We had stated that we anticipated leakage levels to be around 665 million litres per day (ML/d) by 2015, and aimed to reduce this by seven per cent – to 620 ML/d – by 2020.

The response to our public consultation demonstrated that customers thought our longer-term target of 612 ML/d by 2040 was not sufficient. In response we have reviewed our draft Water Resource Management Plan and proposed a revised programme, which includes the additional cost savings we now expect from our progressive metering programme by aiding better targeting of active leakage control and mains replacement activities.

This has resulted in the revised leakage reduction targets shown in the table to the right.

We plan to achieve this by replacing water mains, better targeting of leaks, particularly through a greater understanding of how our network is performing, and improving the way we operate it.



Leakage reduction targets 2015 - 2035

	2015 2020	2020 2025	2025 2030	2030 2035
Leakage reduction per five-year period (ML/d)	59	36	14	0
Cumulative leakage reduction 2015 - 2035 (ML/d)	59	95	109	109
Total company leakage (ML/d)	606	570	556	556

Metering

The proportion of Thames Water customers with a meter is low compared to other water companies, at around 30 per cent. In London, the large number of flats (where installation is difficult) has restricted the uptake of metering. Outside the capital, the proportion is higher, at about 45 per cent.

We will progressively meter all business and domestic premises, with the aim of fitting a meter at virtually all properties by 2030. Where possible, we will install individual meters for each household. Where this is not possible, for example in some blocks of flats, we will fit a ‘bulk’ meter which measures the amount entering the building. This ensures that, even though individual households do not gain an incentive for water efficiency, significant leaks or other causes of excessive water use can be identified and rectified.

The progressive metering programme will start in London and proceed at pace. We aim to have fitted 481,000 more meters by 2020, increasing the proportion of households with a meter from 30 per cent to 56 per cent.

As part of this programme we will install ‘smart’ meters, which allow us to take remote readings, without the need to visit the meter, and enable customers to monitor their own water use. The information provided by smart meters will enable straightforward identification of leaks on individual customers’ pipes. It will also provide us with valuable information about leakage from our own network, ensuring that we can target our mains replacement activities efficiently. Widespread metering will open up opportunities for new pricing bands, often known as ‘tariffs’. We will trial these over the next five years, to see if they help reduce demand for water and to test the acceptability of this approach with customers.



Water efficiency

Our progressive metering programme will, of course, create a significant incentive for many more households to use water wisely. We will maximise the benefits of this programme by offering customers free water efficient devices and advice, as well as seeking to stimulate local debate, wherever meters are being rolled out.

We will also continue to promote simple ways for all our domestic and business customers to save water. This is a feature of the enhanced service we are already offering to our business customers.

We will make our own direct contribution to water efficiency by reducing the amount of water used as part of our water and sewage treatment processes – for instance, to cool or clean equipment.

We will continue to play a leading part in the Save Water Swindon campaign where we have offered a free water-saving home makeover to every customer, offering to fit the latest water-saving technology to taps, showers and toilets. We are seeking opportunities to replicate this elsewhere in our region.

New water resources

In the longer term, we do not believe that reducing demand for water will be sufficient to meet the twin challenges of population growth and climate change. Our work suggests that new water resource options, including a new strategic resource, for our supply area – and the south-east of England – will be required in the late 2020s.

Beyond 2020, we will look to improve the links between our supply zones. This will make supplies to customers more reliable, helping to meet the challenges of population growth and climate change. It will also provide long-term protection for some areas that at present can be supplied from only one water treatment works.

Where sustainable, we also intend to develop small-scale local groundwater schemes – for example, by making greater use of aquifers as a form of natural underground storage.

There are three main options for a strategic resource. These are additional reservoir storage, wastewater recycling and bulk water transfers from other parts of the country. Deciding which of these options will provide best overall value for our customers and the environment requires detailed studies, involving a range of stakeholders and potential partners. That work is well under way and we expect to be able to make a firm recommendation in our 2019 Water Resources Management Plan.

The advantages and disadvantages of reservoirs and bulk water transfers are relatively well known. Although a common practice in some other parts of the world, planned wastewater recycling is relatively untried in the UK. It involves putting treated effluent from a sewage works through a further process which allows the effluent to be returned to a river at a higher than usual quality and pumped out again downstream for treatment to drinking water quality standards and supply to customers. We need to undertake further research on this approach over the next five years.

In the medium to long term we believe it is sensible for stakeholders, regulators and water companies to decide on the best overall approach to maintain supplies in the South-East. Solutions of this sort will take a significant time to construct and commission. This means studies need to be carried out by 2020 to decide on the best approach.

Throughout both the short and long term, we aim to increase our own capability by investing in our technical skills in water resource management and hydrology.

Our water treatment strategy

Customers want to be able to rely on us providing top-quality tap water around the clock.

Facts and figures

- We operate **94** water treatment works, ranging from small rural sites to our largest plants in London.
- We carry out about half a million drinking water quality tests per year.
- **99.97** per cent of samples of our tap water currently meet stringent UK and European quality standards – among the best in the UK.

We produce some of the best-quality tap water in the UK, but in operating our treatment works we face significant challenges from population growth and climate change.

Our strategy is to improve gradually both the capacity and the reliability of our major works. We will target investment where the potential effect of equipment failure on customer service is most significant.

We have carried out a site-by-site analysis of our existing major works and in the next five years we will focus on improvements to some of our key London water treatment works, to ensure they continue to provide a reliable, safe supply.

Looking further ahead, there are significant synergies with our water resources strategy, because reducing demand for water and losses from our system will reduce the need to build new water treatment plants.

The better the quality of the water we take from the environment, the less treatment it requires. We will continue our existing catchment management work, finding ways to stop pollutants entering water sources – for example, by introducing new landscaping features such as grassed areas and ditches.

We will continue to replace our lead pipes in areas at highest risk of exceeding new regulations to be introduced later this year.

We will continue to improve the resilience of electricity supplies to our treatment works, including providing stand-by generators for use in the event of power cuts or other problems.

We currently have a capable workforce, but need to ensure we have the right skills to operate new processes and innovative technology. We will continue to invest in our staff to ensure they have the necessary skills.



Our water distribution strategy

The reliability of our water supply network is key to the service customers receive.

Facts and figures

- Our distribution network covers nearly **20,000** miles and supplies more than **3 million** properties.
- We operate the oldest network in the UK, with an average age of about **70** years. **Two-thirds** of our water mains have been in use for more than **50** years.

Our water distribution network is the system of pipes, pumps and other infrastructure that delivers treated water to our customers. It includes mains, storage reservoirs, tunnels, aqueducts and pumping stations.

A high rate of burst mains, coupled with the need to reduce leakage, means our total expenditure in this area is significant. In addition, about 25 per cent of the written complaints we receive concern issues related to water distribution. Supply failures and the impact of repair work also lead to high volumes of calls from customers.

Our strategy is to make use of the latest technology to monitor and manage the performance of our system and reduce losses of water. Improving our knowledge of the system, with information from many more 'smart' meters, both in buildings and in the network, is the key. It will give us a single model to help us identify where replacing mains will best improve our service and reduce long-term costs, easing pressure on bills.

We also need to improve our knowledge of the deterioration rate of our largest pipes, known as trunk mains. These are the main arteries of our water supply network and are very disruptive when they burst. Although this happens only occasionally,

improved monitoring will help us to better predict and prevent these bursts. Using this information, we will start a structured long-term programme of trunk mains replacement from 2020. Our long-term plans to deal with this issue include ongoing work to understand corrosion and developing a tool to analyse the cause of such bursts, to ensure we replace lengths of main at the end of their useful life. We will also develop modelling to better understand the size of network required to meet the needs of London over the next century.

Since 2001 we have been carrying out a programme to replace the oldest and leakiest of our smaller pipes and improve overall performance. This has been a major factor in achieving our leakage target for the last seven years. However, an independent review requested by Ofwat has concluded that some of this mains replacement work could have been better targeted. The programme will continue to at least 2020, incorporating the lessons from the independent review in both mains replacement and the control of fluctuations in pressure, which can cause leaks and bursts. Wherever possible we will use innovative 'no dig' techniques that avoid the need to create trenches, lessening the disruption our work can cause.



Our wastewater collection strategy

Reducing the potential for overflows from our sewers is a key focus of our work.

Facts and figures

- We are responsible for **66,500** miles of sewer – if laid end to end, more than twice the circumference of the Earth.
- We manage over **2,500** pumping stations, and are due to take responsibility for **5,000** more – currently privately owned – by October 2016.
- We had to remove more than **54,000** blockages from our sewers in 2011/12.

We collect and treat wastewater from 14 million people and recycle it safely to the environment.

Our wastewater network includes sewers, pumping stations and other equipment used to capture and transport sewage.

The number of calls we receive about failures related to our sewerage service is in line with the industry average. However, the consequences can often be very unpleasant for customers and can involve public health issues – as in the case of sewer flooding.

Feedback from customers has told us they see preventing sewer flooding in properties as a priority and that the quality of rivers is a major concern.

Our strategy is to take a fully integrated and active approach to running our wastewater system, from sewers though to treatment works. A major part of this will involve cost-effective measures to reduce the input of rainfall to our sewers. In some areas, our sewers operate as a combined system, with rainwater and foul sewage carried in the same network. High volumes of rainfall can therefore fill the system to capacity, causing untreated sewage to overflow, potentially leading to flooded properties and polluted watercourses. It also increases wear and tear on our equipment, putting pressure on pumps and treatment works, and increasing energy costs.

The Thames Tideway Tunnel will be the biggest single wastewater project in the UK since Sir Joseph Bazalgette built London’s combined sewage and drainage system in the 1850s. The tunnel is required to deal with the now overloaded combined sewer network in London. Although likely to be delivered by an independent ‘Infrastructure Provider’, the tunnel will become part of our network and will be operated as such.

In addition to the problems caused by heavy rainfall, pumping station failures and structural problems caused by tree roots can also result in overloaded sewers, leading to the flooding of roads, gardens and, in the worst cases, the inside of homes. The improper disposal of unsuitable items, such as fat, wet wipes and sanitary items, via sinks and toilets can block our pipes and have the same effect. We will continue to explain this to customers and also make a robust challenge to the manufacturers of so-called ‘flushable’ items.

In some situations, the most cost-effective solution to under-capacity in sewers will be to extend or improve our network. But wherever possible we will look for more sustainable ways to manage rainfall and prevent it entering sewers in the first place.

This will involve working with the Environment Agency and local authorities to promote and install sustainable drainage systems (SuDS). These encourage rainfall to soak into the ground rather than running into our sewers and prevent, or slow down, the entry of rainwater into our sewers. Examples include grassed roofs, balancing ponds, water butts and porous paving.

We have several trial SuDS projects under way. We will ensure that the results are communicated widely and replicated where possible.

We are beginning to move towards managing our network more actively, with the installation and increased use of real-time control and monitoring systems. This technology is proving effective in helping us to manage our network more actively and to take swifter action to avoid operational problems.

A properly targeted active maintenance programme is being developed to reduce overall costs in the long term. New surveying methods will be used to obtain improved information on the condition of our sewerage systems. A better understanding of the deterioration rate of sewers and other pieces of equipment will enable us to target our maintenance and investment efficiently and better manage the risk of things going wrong.

This work has been made more challenging by a change in legislation. In October 2011 we were required to take responsibility for 25,000 miles of sewers, representing a 60 per cent increase to the length of our network. Many of these sewers had been poorly maintained. In October 2016 we will take over an estimated 3,000 pumping stations, currently under private ownership. We will need to assess their condition and ensure they are working to a safe and serviceable standard.

Our research shows that customers are concerned about the discharge of raw sewage into waterways. Most pollution incidents are caused in our sewer network

by insufficient hydraulic capacity, either due to blockages, high rainfall or poor operation.

Our plan for the next five years will address remedial action at nine pollution hotspots identified by the Environment Agency. We are also targeting 200 polluted surface water outfalls, again identified by the Environment Agency, where sewage enters a watercourse through pipework that is meant only to carry surface water.

Large parts of our sewerage network can be affected by high groundwater levels and infiltration following prolonged rainfall, as

demonstrated by the wet summer of 2012. We have identified 15 locations covering 65 sub-catchments where we intend to make improvements by 2020.

We will also continue working with the Environment Agency to identify situations where foul drainage has been wrongly connected to pipes intended to take only surface water run-off. These misconnections cause pollution of rivers, lakes and streams. When we can pinpoint the properties responsible, corrective action can be taken by local authorities.



Our wastewater treatment strategy

The quality of treated effluent we recycle to the environment is vital for the health of rivers and streams.

Facts and figures

- We treat more than **4.2 billion** litres of sewage on an average day.
- The region we cover contains **15 million** customers.
- We manage **350** sewage treatment works, including the UK's biggest, at Beckton in east London.

Our 350 sewage works are currently almost 100-per-cent compliant with the treatment standards set by the Environment Agency. In times of low flow, treated sewage effluent often forms a major proportion of the volume in the watercourses to which we discharge it, so our activities play a major role in safeguarding the ecology of the rivers in our region.

Our strategy is to give priority to ensuring our works continue to meet whatever standards are set, through careful assessment of the risk of failure and focusing investment accordingly. This will include improved monitoring and real-time control of our treatment operations and an increased focus on pre-emptive maintenance work on equipment which, if it failed, could cause significant problems such as river pollution.

This approach will also help us make better-informed decisions on where best to invest to reduce the risk of operational problems. This will reduce overall costs in the long term, which in turn will help reduce pressure on customers' bills.

We will continue to take a risk-based approach to tackling odour problems at our sewage works. A recent legal case has highlighted the importance of ensuring we have a much better understanding of this potential issue at all our sites. We intend to improve our monitoring to help address this.

In the light of increasing energy and chemical costs, and the need to reduce carbon emissions, we will seek innovative ways to minimise the resources we use to treat sewage. This will include introducing low-maintenance, natural treatment processes at more of our smaller works. At our larger works we will look particularly for improvements to the aeration process, which is the most energy-intensive stage of treatment.



Our sludge treatment and disposal strategy

We want to minimise the volume of sludge we produce, while maximising the energy we generate from it.

Facts and figures

- We manage over **1 million** tonnes of sludge per year.
- Around **80,000** vehicle movements are needed to treat and recycle the sludge.
- About **32,000** hectares of farmland is used for recycling sludge each year – equivalent to roughly **40,000** football pitches.

Around 99 per cent of sewage is water, which we treat and recycle safely to local rivers and streams. The process leaves a solid residue, known as sewage sludge. We have generated renewable energy from some of our sewage sludge, either by digestion or incineration, for decades. We currently meet 12 per cent of our own power needs in this way, but there is considerable potential to do more and rising energy costs make this an increasingly attractive opportunity. We plan to increase this to 33 per cent in the 2015-20 period.

After treatment, with or without energy recovery, about 60 per cent of the sludge we produce is recycled to farms, where suitable land exists. The remaining 40 per cent is produced at Beckton and Crossness, our major works situated in the dense urban areas of east London. In these works the sludge is incinerated and energy is generated from steam.

Our strategy is to increasingly adopt treatment processes that will maximise the generation of renewable energy and minimise the volume of sludge produced.

At some of our rural works the current treatment process involves mixing lime with the sludge. This can be recycled to farms, but does not allow us to generate energy. It also produces smellier sludge and a higher volume, which adds to haulage costs. We are therefore moving away from this form of treatment.

Instead, we are increasingly introducing thermal hydrolysis, a process which ‘pressure cooks’ sludge, allowing us to turn more of the organic material into gas. It generates more power while reducing the volume of sludge we need to recycle to farmland. By 2015, we will have already made this change at six sewage works. We are also phasing out the recycling of digested liquid sludge due to the Nitrates Directive, which further limits the periods when we can spread it on fields. We are making changes at some works to allow us to turn this into a dried ‘cake’, which will increase the amount of this type of sludge that we recycle to land.

The sludge-powered generators in which we burn sludge at Beckton and Crossness will reach the end of their anticipated lives by 2020. Despite ongoing maintenance, we will need to improve or replace them between 2015 and 2025. The new thermal hydrolysis technology at both sites, and at our Riverside works, will provide extra capacity during this planned work, as well as catering for local population growth.

Pressure on the availability of farmland for agricultural recycling of sludge is likely to grow, as other organic-based fertilisers, such as composted green waste, become available to farmers. The land required for spreading them is forecast to exceed the area needed for spreading our treated sludge. Current forecasts predict that this growth will create a deficit for us beyond 2026.

Further pressure will result from the increasing challenges the Environment Agency is making to the amount of phosphate applied to land by sludge recycling.

We will continue to comply with the Safe Sludge Matrix, a voluntary agreement between water companies and retailers. This defines what treatment is required before sludge can be applied to certain crops. Despite this, some industries that buy crops from farmers will not do so if they have been grown on land treated with sludge. Factors outside our control may lead more farmers to agree contracts of this sort.

We aim to ensure safe and sustainable recycling, to give confidence to farmers and food producers, but also to reduce our reliance on farm land by using other forms of treatment and energy generation.

Reducing the volume of sewage sludge we produce, by removing as much water as we can from it, will help cut transport costs and ease pressure on the availability of farm land. We have carried out successful trials of ‘Bucher’ presses, developed for the cider industry to squeeze juice from apples. These will help us reduce the amount of water in our sludge, and have been installed at four of our sewage treatment works.

In addition, we will examine using low temperature driers to produce a dried sludge. This could potentially be used either as a fuel for our sludge-powered generators or for other processes involving thermal destruction. One such process, which we are also studying, is pyrolysis. This enables sludge to be turned into a synthetic gas, which can be used as a fuel for a combined heat and power engine.

In addition to increasing the amount of energy we generate from sludge, we also want to recover nutrients from it, for which there could be a growing market. We already run a phosphate recovery plant at Slough sewage treatment works, and aim to expand this area of our business.



Beyond 2020

In the preceding pages of this strategy document we have focused on the areas where we have definitive plans to deliver changes, either in the next five years or beyond. For example, we have discussed the need for a strategic water resource for the South-East around 2025-2030 and explained our plans for rolling out our progressive metering programme over the coming years.

However, we recognise that the operational environment will continue to change. This requires us to set out a strategic direction for the company that allows us to build upon the achievements we have made to date.

Over the coming years we will build upon our 2015-2020 business plan and continue to move from being an operationally asset-focussed company to a customer-centred business.

We will need to remain flexible and have the ability to respond to changes in the economic and regulatory environment.

We welcome the opening of competition in the sector, which we will help facilitate and develop, and will provide greater choice for customers through the provision of a wider range of services. To help enable this, we will seek out opportunities to work with other industries, such as the energy sector, to lead a strategic approach for the delivery of a better overall experience for our customers.

We will further this approach to working collaboratively with our stakeholders, regulators and other authorities to develop new holistic and sustainable approaches to protect the environment and provide greater benefits to customers.

As well putting customers at the centre of our business we will always strive to deliver continuous improvement for today, whilst providing the flexibility and agility to meet the demands of tomorrow.

Conclusion

In this document, we have described the course we have set ourselves for the next 25 years, but we have not set this course in isolation.

Our customers have told us what they expect us to prioritise and the levels of service they want to receive in the future. It can only be reasonable to expect that their expectations will change over the coming years, as the economy and developments in technology continue to evolve.

We have set out our long-term strategy with our customers' views at the very heart of what we want to achieve in the future. We have listened and prioritised in the areas we know are important to them. These include affordability and responding when things go wrong, as well as specific issues such as cutting leakage, tackling internal sewer flooding, and reducing odour from treatment works.

We anticipate that our fundamental role will continue to be to provide our customers with clean, safe drinking water and to recycle their wastewater to the environment. We aim to continue to provide this most essential of services, in light of the many challenges we have discussed in this document. We will seek to develop the six outcomes we have identified to the best of our ability both today and into the future.

