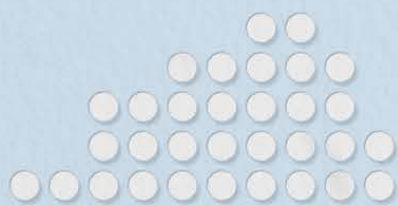
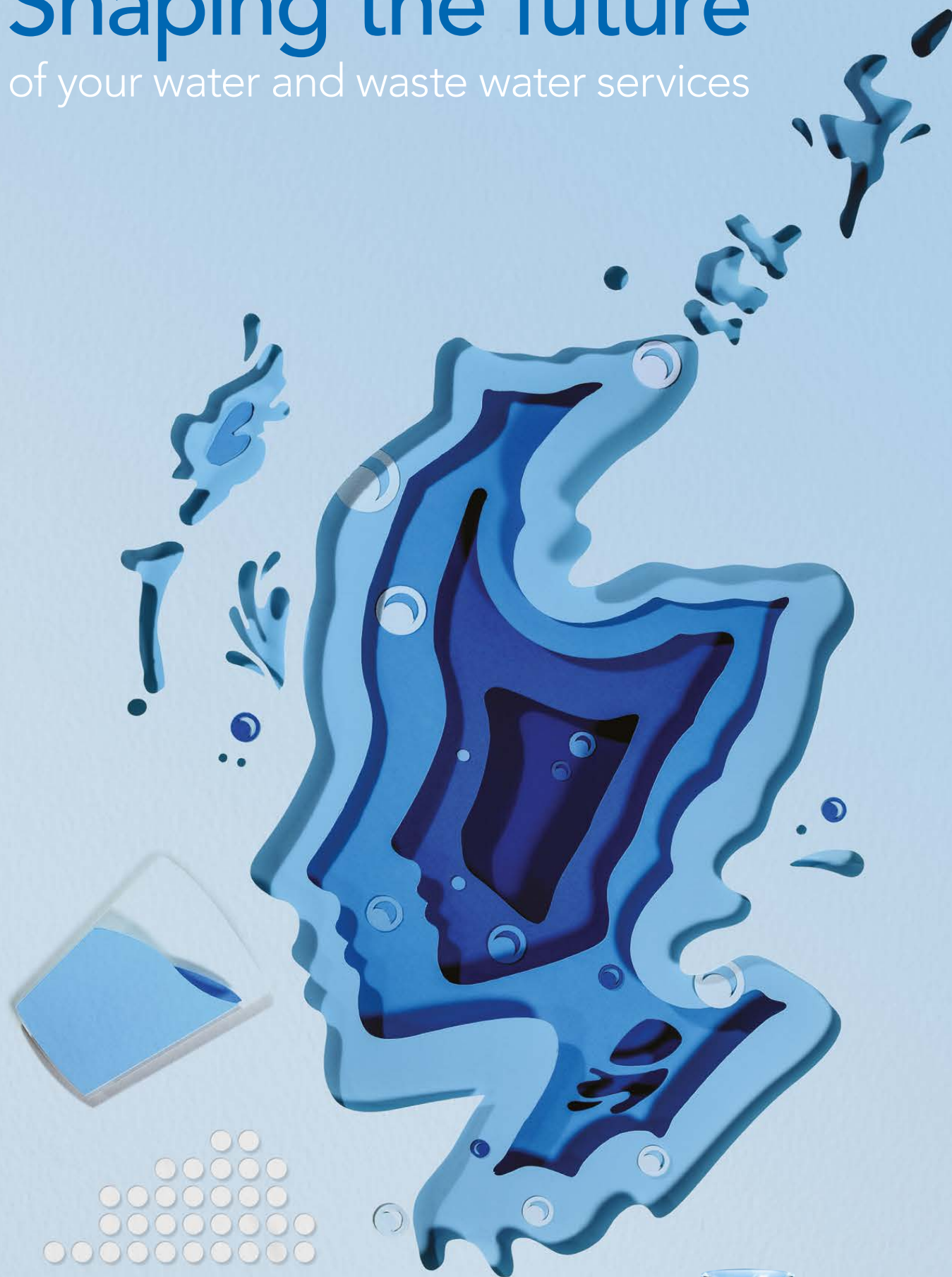


# Shaping the future

of your water and waste water services



Draft Strategic Projections



**Scottish  
Water**  
Trusted to serve Scotland

# 1 Introduction

Welcome to our strategic projections. This document sets out how we propose to support our customers and communities across Scotland in the decades to come. You, as our customers, are at the heart of our business, and we have published this document to invite your views on our ambitions and proposals.

We provide vital water and waste water services to nearly every household and business in Scotland. Our drinking water and the quality of Scotland's water environment are at their best ever levels. Through our work, we make a vital contribution to Scotland's health, prosperity and the sustainability of our natural environment. As such, **our vision is to be trusted to care for the water on which Scotland depends.**

In preparing our proposals we have researched customer views on the services we provide and have examined the trends and drivers of change out to the middle of this century.

The world is changing at a dramatic pace and successful businesses of the future will be innovative, resource efficient and low carbon; harnessing the power of technology and the skills of their people and partners. In the following sections we set out how we will embrace digital transformation and innovation, become low carbon and manage the various impacts of climate change.

We are a leading utility and proud that Scottish households trust their water services more than any other consumer sector<sup>1</sup>. But we are ambitious to do more, and to reach a level where our services are truly reliable and sustainable for future generations. So we have set out three long-term ambitions, on which we welcome your views.

## Our ambitions:

- 1. Delivering a consistently leading customer experience.**
- 2. Keeping customer prices low** by driving for further innovation and efficiency and through smart investment choices.
- 3. Increasing the reliability, resilience and sustainability of our services to:**
  - Deliver high quality, great tasting drinking water.
  - Provide effective and sustainable collection and treatment of waste water, reduce the rainwater entering sewers and protect Scotland's water environment.
  - Support the growth in Scotland's economy, population and households by expanding our networks and infrastructure.
  - Become more resource efficient, low carbon and socially sustainable.

## Our contribution to the United Nations Sustainable Development Goals:



In recent years, household living standards have fallen and the latest economic forecasts suggest they will take a number of years to recover. So we are determined to avoid creating further pressures for our customers by keeping average customer prices low; aiming to limit price rises to the rate of inflation. This is a very stretching ambition against the backdrop of our need to increase significantly the level of asset replacement and maintenance and the external pressures facing us such as climate change. But we are determined to rise to this challenge and earn our customers' trust for the way that we care for the water on which Scotland depends.

While most of our customers receive a flawless supply of water and waste water services, it is clear that customers have an increasingly low tolerance for service failure because they depend on our essential services at home and in their businesses.

To deliver consistently high quality services to our customers across Scotland we rely on a vast number of assets, including over 2,000 treatment works and an underground pipe network of nearly 100,000 km, which would stretch twice round the world. So it is inevitable that, every day, there is scope for services to be disrupted, especially as our assets age. We are, therefore, a business that will always be managing risk. Our task is to manage and minimise risk, making smart investment choices, to maximise the benefits from the available funding.

Some of our most important choices over the coming decades will be to identify and agree with our customers and regulators which risks we should continue to manage with first class response and recovery and which risks we should aim to minimise through appropriate investment to deliver a truly reliable and resilient service.

In 2015, Scotland was one of the first countries in the world to sign up to the United Nations (UN) Sustainable Development Goals and vision to end poverty, hunger, inequality and to protect the environment. We have a part to play and, in this document, we highlight how we can support Scotland's contribution as a Hydro Nation across the 10 relevant UN goals listed above (you can see all 17 goals at [sustainabledevelopment.un.org](https://sustainabledevelopment.un.org)).

To keep delivering a world class water service we must take a long-term view because most of our new investments (and existing assets) will last for many decades. It is essential that we seek to understand the likely future challenges and opportunities, making the right choices to support the needs of both current and future customers.

The next sections set out in more detail what the future might hold, and our proposals for how we can support our customers and communities across Scotland in the decades to come. We look forward to hearing your views.

**Douglas Millican**  
Chief Executive





About

## Scottish Water

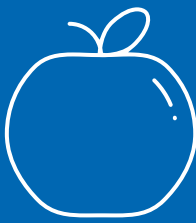
Scottish Water is a unique publicly-owned utility. We provide vital water and waste water services, essential to daily life, to 2.5 million households and 156,000 business premises across Scotland.



We provide

**1.35 billion**

litres of clean, fresh drinking water every day



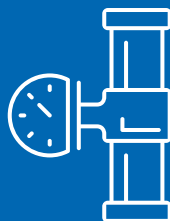
and the smallest serves

**1 primary school**

Our biggest water treatment works serves over

**500,000**

customers



We supply water through

**48,480 km**

of pipes



We carry out over

**311,000**

drinking water quality tests on regulatory samples per year



We are the  
**4th largest**  
water and waste water  
service provider in the UK



The replacement value of  
our asset base is around  
**£70 billion**



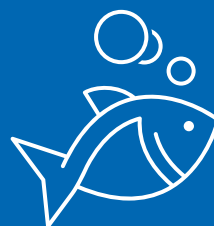
We take away  
waste water through  
**51,199 km**  
of sewers



We employ over  
**4,000**  
people



Of our  
**1,826**  
waste water  
treatment works  
**1,453**  
serve populations  
less than  
**500**



We help protect over  
**18,600 km**  
of Scottish coastline

## 2 What might the future hold?

Although no-one can truly predict the future, we must develop long-term plans that can stand the test of time – especially because most of our existing assets and new investments will last for decades.

To help us understand what our customers may expect in the future, we have used a method known as ‘scenario planning’ to develop a set of possible future scenarios for what the world may look like in the middle of this century. Details can be found at [www.yourwater.scot](http://www.yourwater.scot)

This exercise found that the biggest challenges we are likely to face are climate change and our ageing infrastructure and asset base, while the greatest opportunities are in digital technology and innovation. At the same time, we will be adapting to the changes in Scotland’s population and growing number of households.

### **Economic and regulatory uncertainty**

Since the 2008 financial crisis, living standards have fallen. Recent economic forecasts have downgraded the rate at which they may improve.

Much of what we do, and the improvements that we make, are governed by law. For example, the Water Framework Directive and Priority Substances Directive aim to improve river and groundwater quality and reduce concentrations of chemicals in our rivers. It is not yet known how emerging threats to the environment, such as microplastics, will be managed or what further threats will arise. The Drinking Water Directive sets standards for water intended for human consumption, by ensuring that it is wholesome and clean. The directive is currently being reviewed and we are expecting both tighter and new standards to be included.

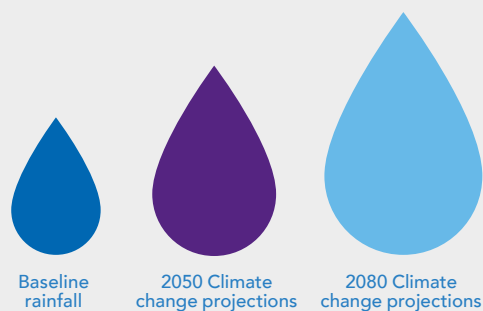
We will continue to work with our customers, regulators and the Scottish Government to shape a robust and appropriate regulatory framework that supports the Scottish Government’s objectives for growth and the circular economy, fostering a sustainable water industry.

### **Climate change**

Climate change is a global issue, the impact of which is intensifying. Predictions have suggested that Scotland will have hotter and, at times, drier summers as well as increasingly intense periods of rainfall. Current projections show that an increase in rainfall intensity of approximately 45% over the next 30 years would cause a 90-135% increase in water volume in our sewers. As our sewers were built in the nineteenth and twentieth centuries, they will not always be able to cope with this increase.

#### **Climate change**

Increasing rainfall intensity in Scotland



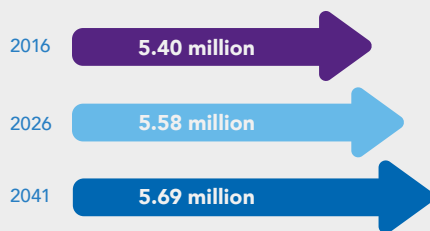
Climate change may also cause changes in the quality of our source water, water shortages, flooding of our infrastructure, and knock-on effects on other infrastructure.

### Changes to Scotland's population

Scotland's population will change over the next 25 years. Current forecasts suggest there will be a 5% growth in population, a general west to east migration, continued movement towards large towns and cities and a reduction in average household size due, in part, to an increasingly ageing population. Together these factors will lead to a significant increase in the number of properties to be served in certain locations. This will require significant investment to extend and upgrade our networks and infrastructure.

#### Population shifts

Scotland's population is projected to increase



Source: National Records of Scotland 2016-based projections

### Digital transformation

Scotland's national digital strategy aims to ensure the country realises its potential in an increasingly digital world. In future, our customers will expect to interact with us through their preferred digital channels. To achieve our ambitions, we will need to operate increasingly connected assets, relying heavily on improved data networks and levels of connectivity across Scotland.

Machine learning and artificial intelligence should allow us to make better decisions. However, we must also take steps to protect against potential threats, such as cyber-attacks.

### Hydro Nation

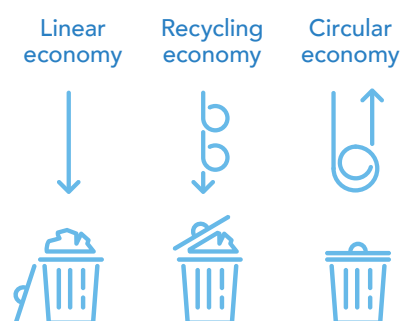
Water is of fundamental importance to Scotland's economy, health, social wellbeing and environment and we support the Scottish Government's 'Hydro Nation' programme to develop the value of Scotland's water resources. We will continue to use our water resources to generate renewable energy, and support Scotland's ambition to create innovations that will shape our industry's future.

Gorthleck Development Centre is Scotland's first full scale test facility dedicated to supporting innovation in water treatment. It provides a safe environment to test new technologies in real life conditions.



## Circular economy

According to the ecological footprint measure, Scotland needs approximately three planets to sustain its current living. An ambition to tackle climate change is at the heart of the Scottish Government's aim to create a growing, sustainable and inclusive economy. Taking a circular economy approach is fundamental to meeting this ambition. We recognise, therefore, that Scottish Water needs to do everything feasible to become more resource efficient.



We have taken significant steps to reduce our carbon footprint (by 24% over the past ten years) and increase the amount of renewable electricity that we generate. Today we generate and host more renewable electricity than we consume. We see even more opportunities to make us a truly sustainable service, including maximising the value we can recover from sewage and developing partnerships with communities. Further information is set out in our [sustainability report](#).

## Natural capital

Scotland's rich and diverse natural environment is a national asset which contributes to our economy and wellbeing. Scotland relies on its natural capital and, as a water company, we interact directly with the water environment across the entire range of water catchment types. From managing water sources in upland areas through to urban drainage and waste water recycling to rivers and seas, we rely on and work with the services provided by nature. We have a role to play to make sure this natural capital is protected and enhanced.





Example of a sustainable urban drainage system (SUDS) pond in Dunfermline, Fife.



Deerdykes anaerobic digestion plant is providing green electricity to the grid and reducing the amount of food waste sent to landfill.



Peat restoration project at Sandy Loch, Shetland. Through partnership working we have taken steps to protect source drinking water by restoring exposed peat. Local partners include landowners, the Shetland Amenity Trust and Scottish Natural Heritage.



# 3 Our Ambitions

## Ambition One A consistently leading customer experience

Although Scottish households trust their water services more than any other sector, we are still keen to do even more. Our ambition is to deliver **a consistently leading customer experience.**

To achieve this, we will continue to listen to our customers and prioritise the things that they tell us are important to them, putting their interests at the heart of everything we do.

We recognise that our customers are both consumers of our services and citizens affected by our activities in the communities in which they live, work and travel.

### **Excellence in customer service**

Our customer research programme is helping us to understand our customers' priorities and expectations, which will shape our future plans.

We will continue to use a range of leading feedback and survey techniques to listen to our customers' experiences of Scottish Water, drawing from the experience of the OECD. We will also continue to benchmark the customer experience we deliver with nearly 500 other organisational members of the Institute of Customer Service, allowing us to learn from other leading service providers.

We will further embrace digital technologies to create an informed, connected and personalised experience, through whichever channel our customers choose to communicate with us. This will be a step change in the experience we provide to customers who contact us.

### **Putting customers and communities at the heart of what we do**

The investments we make in our assets and infrastructure will last for many generations, so we must ensure that they fulfil the needs of both our current and future customers.

Our customers have told us that they want our services to provide value for money, to be reliable and resilient, and they would like us to prioritise:

- Improving the quality of their drinking water.
- Reducing the risk of long-term interruptions to their water supply.
- Reducing the risk of internal property flooding from sewers.

We also know that while our operational and capital programme activities often have positive impacts on the communities we serve, this is unfortunately not always the case.

We interact with a range of communities, from 'communities of place', ranging from city centre neighbourhoods to remote island villages, to 'communities of interest' evolving around common interests such as fishing or surfing.

Each of these has specific needs and preferences, which we will work to understand, endeavouring always to deliver our services and investment in the most effective way overall. To achieve this, we will look at how to increase community input in our decision-making, particularly within our capital programme. Our ambition is for Scottish Water to be trusted by the communities we serve.

To deliver an excellent customer experience, we need great people. We will invest further in our people, developing their skills and talents so that they are trusted to serve Scotland.

### Being a great wholesaler

There are over 25 licensed providers in Scotland's water retail market who deliver services to our business customers. They are responsible for all retail services such as billing, credit management and relationship management.

We will ensure that we provide a great service to these licensed providers, and that their customers receive a high quality water and waste water services.

### Engaging our future customers

Through our volunteering programme, we will visit schools across Scotland to involve young people in our 'water cycle campaign' to educate them in the importance of only putting the right things down the sink or toilet. We will also seek to inform them about the part they can play in more sustainable living, such as using water wisely, engaging them and their families in how we can respond together to the challenges that we face.

We will also continue to use partnership opportunities, like our existing Learn to Swim partnership with Scottish Swimming, to reach young people with key messages including staying safe around rivers, beaches and reservoirs.

**This ambition will contribute to the following UN Sustainable Development Goals:**



#### Improvement priorities

### High

Internal sewer flooding  
Long-term interruptions  
Drinking water quality

### Medium

External sewer flooding  
Short-term interruptions  
Environmental pollution  
Discolouration  
Taste and odour  
Visible leakage

### Low

Bathing water quality  
River water quality  
Low pressure  
Waste water treatment works odour



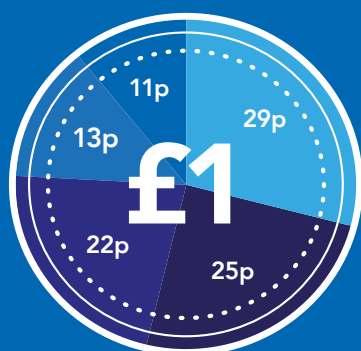
St Mary's Primary School pupils learning about our water cycle campaign and water efficiency.



## Ambition Two

### Keeping customer prices low

We currently charge most households less than £1 a day. We face increasing pressure on our finances, mainly because we will need to increase significantly the extent of asset replacement, but also because both our customers and regulators expect us to improve our services. However, we recognise too that many households and businesses are under financial pressure. Against this backdrop, we are setting a very stretching ambition of **keeping customer prices low**.



**Every £1 of customer charges currently contributes to these five areas.**

- 29p** Operational costs including our people, energy and other day to day running costs
- 25p** Replacing and refurbishing assets to maintain service level
- 22p** Meeting new standards and improving our service
- 13p** Paying for PFI services
- 11p** Paying interest on money we have borrowed

We propose to balance the rate of investment with the impact on customer prices by aiming to limit price increases from 2019 onwards to the rate of inflation, and by seeking continued access to appropriate levels of borrowing from the Scottish Government. Adjusting prices annually in line with inflation in the near term will be essential to seeking to limit longer term price changes to inflation.

#### **Efficiency and innovation**

To achieve our ambition of keeping customer prices low, we will also focus on keeping costs down by being ever-more efficient and innovative, delivering within our means and balancing investment priorities with the available financing.

Over the past 15 years, our efficiency and the service we provide to our customers have both greatly improved.

We will continue to embrace lean management, operational excellence and research and development as ways to deliver improvements.

Twenty of Scotland's waste water treatment works, and our largest sludge treatment centre, are currently operated under long-term Private Finance Initiative (PFI) contracts. We will manage the end of our PFI contracts on a case by case basis to take advantage of cost saving opportunities and manage the risks. When we take back control of these assets, we will need to invest to maintain or replace them - whichever delivers the best value. We expect there to be scope for long-term savings because of our lower financing cost and advantages from integration with our wider workforce and asset base.

As historic debt reaches the end of its term, it is replaced with new debt. We always try to minimise the interest costs on new debt, locking in low fixed rates for as long as possible, particularly in the current climate of low interest rates.

### Delivering within our means

We will use our customer research to review and prioritise annual investment of around £550m to £650m over the next 25 years. We will work in partnership with regulators and stakeholders to identify projects that can deliver multiple benefits.

At the same time, we are embarking on joint working with our economic regulator, the Water Industry Commission for Scotland, to improve our understanding of the significant necessary increase in the long-term levels and timing of investment to maintain and replace our ageing infrastructure and assets.

### Growth investment and financing

We expect Scotland's population to keep growing. This initially puts pressure on expenditure as we expand our network to supply additional housing and ensure there is sufficient capacity in our systems.

The cost of this investment to support new developments is currently shared between existing customers and new customers/developers. We propose to work with the Scottish Government to review the current arrangements to ensure a fair balance of cost sharing over the long-term.

### Charging basis

We support the continued use of council tax bands as the basis for setting household customer charges as it is simple, cost effective and also provides a level of fairness.

We will continue to work with stakeholders to understand how we can best help customers in the most vulnerable circumstances, who may struggle to afford their water charges while also exploring opportunities to broaden our revenue base.

**This ambition will contribute to the following UN Sustainable Development Goals:**



## Ambition Three

### Increasing the reliability, resilience and sustainability of our services

While most of our customers receive a flawless supply of water and waste water services, rising expectations and the challenges we face require us to **increase the reliability, resilience and sustainability of our services to:**

- Deliver high quality, great tasting drinking water every minute of the day.
- Provide effective and sustainable collection and treatment of waste water, reduce the rainwater entering sewers, and protect Scotland's water environment every minute of the day.
- Support the growth in Scotland's economy, population and households by expanding our networks and infrastructure.
- Become more resource efficient, low carbon and socially sustainable.

Our ambition reflects the expectations of our customers, the requirements of developers and a growing economy, and the priorities of our regulators in the context of our legal obligations.

To meet this ambition, we must invest to maintain and replace our existing assets and infrastructure, improve the resilience of our water and waste water networks, and enhance or expand some of our assets and infrastructure to fulfil our statutory obligations and support a growing economy.





## Maintaining current levels of service through our existing asset base

Our customers have told us that they value the reliability and quality of the service we provide and want this to continue.

To maintain our current service levels, we:

- Operate and manage our treatment works and networks every day of the year.
- Ensure our assets are routinely maintained in order to maximise their lifespan.
- Have first class response and recovery capabilities, which avoid or minimise any disruption to our service when incidents, such as a burst water main, occur.
- Replace or refurbish assets when they near the end of their lifespan.

To achieve our ambition of delivering increasingly reliable, resilient and sustainable services, we need to further improve our understanding of our assets; be leaders in asset management; and significantly increase investment in this area over the next 15 years.

### Understanding long-term maintenance needs

Ageing assets present a challenge across all developed economies. If the water industry continues to replace its assets at the current rate, these assets will need to last for hundreds of years, which is widely considered to be unrealistic. Climate change and population growth will put our existing assets under further pressure, increasing the need to replace or upgrade them. The estimated cost of replacing all our assets is around £70 billion\*, and it is likely our assets have an average lifespan of around 100 years.

This means we would need to invest around £700m every year just to prevent the condition of our assets from deteriorating. This is more than double what we currently spend on capital maintenance.

However, as we are determined to keep customer prices low, we are actively seeking new technologies and strategic approaches to reduce the cost of replacing our assets.

We welcome the opportunity to work with the Water Industry Commission's advisory panel and the OECD to learn from other sectors and examples of worldwide best practice that we can incorporate into our own.

### Understanding our assets

To better understand the condition, performance and criticality of our assets, and how much maintenance they will need, we will expand our asset inspection and monitoring programme.

Through developments in digital and sensors we will capture and store key information about our assets in real time. We will refine how we predict our maintenance requirements, based on the knowledge of our assets as well as external factors like ground conditions and changes in climate.

### Our approach to asset management

We are moving towards an industry-leading, planned and predictable maintenance regime.

To enable us to make the right maintenance decisions at the right time, we will continue to:

- Use leading practice in our asset management activities.
- Improve the capability of our systems and people.
- Develop our ability to analyse data.
- Build better costing tools.
- Embrace innovations in asset inspections and monitoring.

\* This represents equivalent replacement cost of our asset stock.

## Resilient water supplies

Over many years, Scotland's water supply systems have evolved from local town supplies to regional systems. The resilience of these supply systems has historically been considered less important than improving water quality and availability. However, interruptions to supply have a significant impact on all our customers, and our business customers tell us it is their biggest concern.

In order to deliver high quality, great tasting water to customers every minute of the day, we now need to further improve the reliability and resilience of our water supply systems.

### Meeting demand over the long-term

To meet future demand for water, we need to get the right balance between managing our water resources, managing storage, reducing leakage and working with our customers to use water more efficiently.

We currently have the lowest carbon water supply in the UK, but there is more we can do to further reduce waste and our impact on the environment. We will look for innovative solutions to reduce leaks from our pipes and the costs associated with addressing them. We will use the findings of our water efficiency trials to inform customers and encourage them to use water wisely, and reduce their long-term water consumption.

### Becoming more connected

By 2021, improved system connectivity will mean that one third of our customers can be supplied by more than one water supply system (see diagram opposite). The majority of our customers will therefore continue to be vulnerable to extended supply interruptions in the event of a major asset or system failure.

Our long-term resilience strategy is therefore to drive up the number of customers with access to more than one supply system by increasing the connectivity of our water supply systems and the raw water resources and treatment capacity.

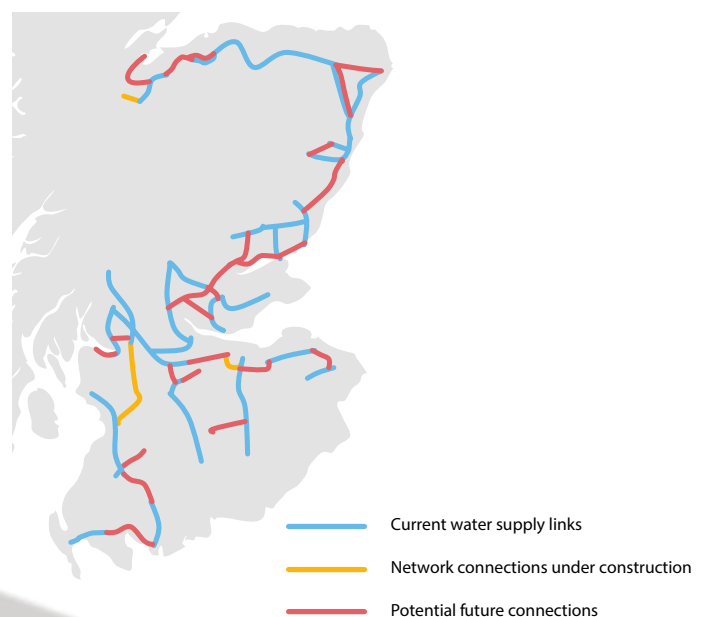
Improved connectivity will provide resilience against problems such as loss of power, drought, pollution, malicious attack (physical and cyber), or an asset failure.

It will also allow us to support housing development and business growth, and further examine the opportunities for asset rationalisation.

### Reducing the impact of asset failures on our customers

The ongoing development of intelligent networks and real-time monitoring of flow and pressure will allow us to identify asset failures more quickly. We will continue to train our operational teams, work with civil contingency partners and improve our response plans so we can respond and resolve incidents as quickly as possible. This is particularly important in rural or island communities where improving connectivity may not be achievable. In these areas we will rely increasingly on tankering to provide adequate resilience by pumping water into our networks when supply would otherwise be interrupted.

Building a fully resilient water supply system will take many decades to achieve. In the meantime, we will seek to reduce the impact of asset failures or drought on our services to customers by further improving our response and recovery capability. In the unlikely event of a large scale or extended duration event, we would work with civil contingency partners to manage the consequences of a major incident (e.g. an extended disruption to the water supply of a major town or city).



## A resilient waste water network

Every day, we collect over 900 million litres of waste water through over 50,000 km of sewer pipes. This network also includes 2,200 pumping stations and contains around 4,000 combined sewer overflows.

Occasionally the sewer system fails, leading to pollution of the environment or flooding of our customers' properties. Customers have told us they want us to prioritise the prevention of flooding internal properties with sewage.

The majority of sewer flooding incidents are due to blockages, often caused by disposal of items such as nappies, sanitary items, wipes and cooking oils. They can also be caused by too much rainwater entering sewers. This problem is growing because of the increasing rainfall intensity associated with climate change, increased paving in urban areas and the impact of new development.

We must therefore take the most sustainable approach to managing rainwater.

### 21st century drainage

We have developed a storm water strategy of 'No more in, what's in out'. This means we want to ensure our sewer network collects as little rainwater as possible, so we can maintain the capacity in our sewers to allow us to safely convey waste water. We aim to remove rainwater from our sewers by diverting it to more sustainable routes via the use of surface water systems and blue-green infrastructure such as sustainable urban drainage systems (SUDS). In order to deliver this more sustainable approach to managing storm water, we will work with our partners including planning authorities, and champion the transformation of the management of surface water in Scotland.

We will continue our industry-leading approach of requiring developers to install sustainable urban drainage systems for new developments, which we will then adopt and manage.

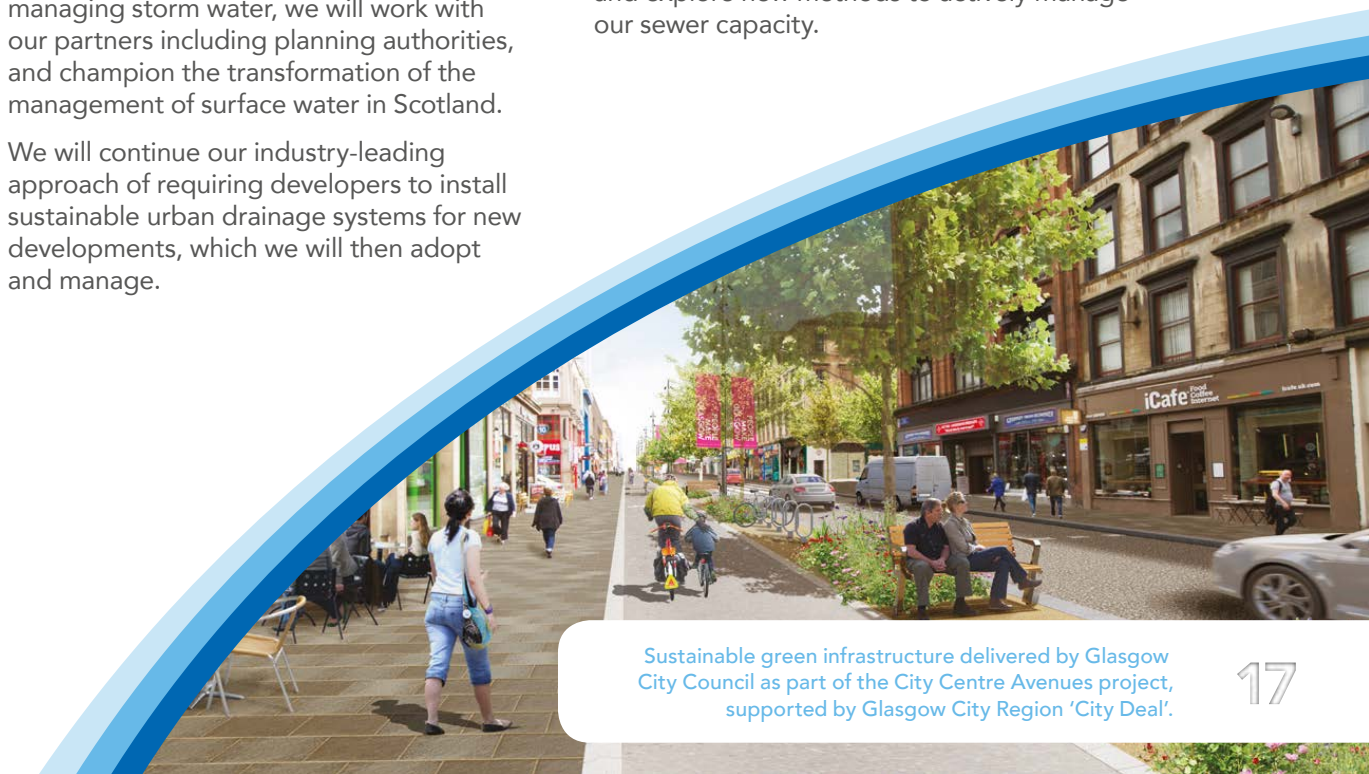
Working with SEPA, local authorities and the Scottish Government, we will deliver integrated catchment studies to develop surface water management plans and exemplar schemes for storm water removal. We will seek to influence public policy to drive changes that will support effective surface water management.

We can no longer rely solely on traditional engineered solutions, such as making our sewers and tanks bigger. These methods are costly, disruptive, carbon intensive and use significant resources, while delivering only limited additional capacity.

We will increase sewer capacity only where there are existing flooding issues, and storm water removal is not feasible for us or our partners. In these circumstances, we will invest in engineering solutions to protect customers from flooding at the lowest possible cost. We will use the latest hydraulic models to understand where the risk of flooding is highest, to help prioritise investment and build assets that will be fit for the future.

### Managing capacity

We will continue to use behavioural campaigns to inform customers that flushing away un-flushable items can cause sewer blockages. We will work nationally with partners, such as Zero Waste Scotland and Citizens Advice Scotland, as well as with European partners, to push for the correct labelling of un-flushable products currently labelled as flushable. Alongside this, we will continue to put into action a planned sewer cleaning programme to prevent blockages, and explore new methods to actively manage our sewer capacity.





## High quality drinking water

Our water service ambition is to seek to deliver high quality, great tasting water every minute of every day. Although the quality of the drinking water we supply is the highest it has ever been, there are still areas that need improving and risks that we need to manage, particularly with our changing climate.

Water quality failures, and complaints about the taste or smell of water, impact on our customers' trust in our service.

We have identified key areas to address including organics, disinfection, discolouration and lead.

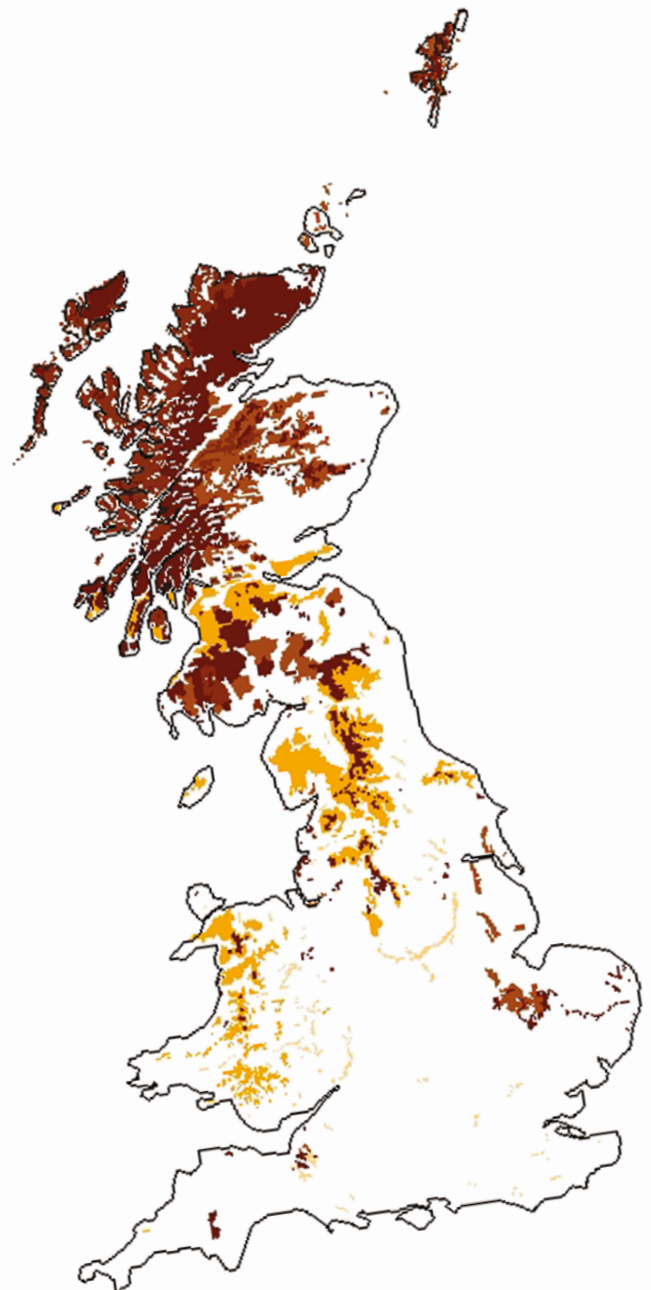
### Managing changes in our source waters

The water we use to produce our high quality drinking water is predominantly taken from surface water sources such as lochs and rivers which are rich in natural organic matter.

Increasing levels of natural organic matter in source waters are placing more strain on our treatment works. To address this challenge sustainably over the long-term, we will continue to monitor the levels of organic matter in our source waters. In partnership with land owners and governmental agencies, we will take steps to manage the source waters using catchment management. Where this approach is not suitable or timely, we will invest in advanced treatment processes.

### Increase the reliability of our treatment works

The majority of our customers rely on a single water treatment facility to supply their water. We need to improve the reliability of our treatment works as they age, and increase their resilience to changing water quality. This may include new treatment stages, improvements to control and instrumentation, and improving the resilience of our power supplies.



#### Levels of organic matter in UK soils

Darker colour indicates areas with high concentration of organic matter in soils

Source: <http://eusoils.jrc.ec.europa.eu/>

### Improving disinfection

We manage an extensive water network of nearly 50,000 km of pipes and 1,300 water storage tanks. Maintaining the condition of our network stops bacteria from getting into our water supply. We will continue our programme of inspections and maintenance, and develop real time monitoring tools to reduce the risk of bacteria entering our water.

If any bacteria do manage to get into our water, we use chlorine or ultraviolet light to kill them and make it safe to drink. To ensure reliable and effective disinfection whilst minimising the taste of chlorine, we need to improve the disinfection facilities at a number of our water treatment works. We will also continue to look for alternative methods of disinfection to minimise the need for chlorine.

### Addressing discolouration

Discolouration of water supplies is generally caused when deposits of iron, manganese and aluminium in the network are disturbed during times of high flow. We will continue to clean and reline the pipe network to reduce discolouration in the most appropriate way and to pursue innovative approaches to managing our networks. Where there is no alternative, we will replace our pipework. We will also use catchment and reservoir management, and invest where necessary to reduce manganese entering the water supply.

### Removing lead

As part of the revision of the Drinking Water Directive we expect the safe standards for lead in drinking water to be further reduced so we will need to do more to reduce the amount of lead in drinking water. The standard UK industry approach is to add a chemical to the water supply, but in our soft Scottish waters it is becoming increasingly difficult to meet the lower lead standards. We will continue to better understand the science and explore alternatives to current chemical dosing and how best to identify lead in our network and our customers' properties.

We will remove any remaining Scottish Water lead pipes and work with the Scottish Government and other stakeholders in respect of lead pipes within customer properties. We are determined to play our part so that everyone can access a lead-free water supply.







## Protecting and enhancing the water environment

Scotland's water environment is the best it has been since the industrial revolution, with 63% of all water bodies classified as having 'good' or 'excellent' ecological status. We have invested significantly in improving and upgrading our treatment assets to clean up the waste water that goes into rivers, lochs and seas.

Our environmental regulator, SEPA, expects compliance with all our licence obligations and would like us to look beyond compliance. Our customers also value a reliable waste water service and a clean natural environment. These expectations have shaped our waste water service ambition to seek to **deliver effective and sustainable collection and treatment of waste water every minute of every day.**

Achieving this will require long-term investment in maintaining our assets, making our service more sustainable and taking a different approach to storm water management. We know that pollution incidents impact on trust in the service we provide, so we need to increase the reliability and resilience of our assets and continue to look for ever more sustainable solutions.

Changes in our climate and population are already putting pressure on our waste water services, and we expect this to become a greater challenge in the future. We will continue to proactively monitor the environment to understand future changes and risks.

## Sustainable investment

We will invest in upgrading our assets where there is robust scientific evidence that our discharges are having an adverse impact on the water environment, there is clear environmental benefit from the proposed investment, and that investment is the most sustainable way to achieve a required environmental outcome.

Where we do invest, we will use it as an opportunity to modernise our ageing waste water processes with innovative and sustainable technologies, and processes that are more energy and resource efficient and provide us with the opportunity to recover value from society's waste.

## Priority substances

'Priority substances' are harmful chemicals that can find their way into the environment through the waste water system. These chemicals are regulated as part of the Water Framework Directive. We will continue to work in partnership with SEPA to manage the risk of priority substances, to understand how these substances enter the water cycle and to work with partners to consider catchment management and source control approaches. Where source control is not possible, we will look to manage priority substances by improving our waste water treatment works.

## Private finance initiative

Twenty of Scotland's waste water treatment works, and our largest sludge treatment centre, are currently operated under long-term Private Finance Initiative contracts which will come to an end between 2021 and 2040. We will manage the end of these contracts on a case by case basis, with the intention to take back control of these assets where this represents best value for money.



## Supporting Scotland's economy

We play an important role in enabling a prosperous Scotland because virtually every new house and business requires a public water and waste water service. Scottish Water is also one of Scotland's largest businesses and employers and supports an extensive supply chain.

We are committed to supporting Scotland's prosperity by:

- Providing the infrastructure needed for new development through timely and efficient investment.
- Protecting the natural environment that so many Scottish businesses rely on.
- Developing the value of Scotland's water resources.

### Enabling new development

We will continue to work collaboratively with developers, planning authorities and other agencies to gain more clarity on the potential timing and scale of new developments.

We will develop tools such as our Readiness Indicator to inform developers of investment needs and encourage them to build where capacity already exists. We will use mapping and modelling capability, together with Local Development Plans, to prioritise investment in our networks and treatment assets, delivering it just ahead of when it's needed.

We will take the lead in providing strategic water and waste water infrastructure where it serves more than one development, it is most cost effective to do so, and there is high confidence that the associated development will progress; for example, developments associated with 'city deals'.

Our plans to work with customers to encourage water efficiency, further reduce leakage, increase network connectivity and take storm water out of our network will all provide additional capacity to support development.

### Supporting businesses

Many business customers use water in a similar way to household customers – albeit on a larger scale – and therefore have similar priorities. For some businesses, however, water is a crucial part of their business process, which means the uninterrupted supply of our service is critical for their economic activity and growth. We must ensure that we provide a consistently great service to licensed providers, and that business customers receive a high quality water and waste water services.

Where businesses require a significant increase in the volume of water supplied to support their expansion plans, we will endeavour to provide this in time for their increased production. Where there is a similar required increase in trade effluent discharges, we will endeavour to accommodate these requirements in line with Scottish Ministers' principles of charging for water and waste water services.

### Rural provision

We will work with the Scottish Government on how we can support their plans for reliable and sustainable rural water and waste water services. Serving rural communities that are not currently connected to the public water and waste water systems presents difficult challenges, often due to the distance from our existing infrastructure, and can be very expensive.





Scottish Water's largest solar photo voltaic installation to date, featuring 4,800 panels, providing electricity to the Spey Boreholes which supply water to the local region. The installation is expected to generate a total of 1GWh of energy per annum, saving 437 tonnes of carbon every year.





## Delivering sustainable services

As with much of the developed world, Scotland uses three times more natural resources than can be regenerated in a whole year. Like many other organisations, we need to use these resources more efficiently to contribute to a truly responsible and sustainable society.

### Transitioning to a low carbon future

Our ambition is to be a leader in delivering a sustainable Scotland, becoming more resource efficient, low carbon, and socially sustainable in everything we do.

To do this, we aim to reduce the energy we use and embrace 'circular economy' thinking to remove waste from our ways of working. We will continue to install renewable power and heat recovery at our assets and host renewable generation on our properties and land holdings. We will demonstrate how we can transform our waste water treatment assets to produce energy and allow us to recover resources.

We will also transition our vehicle fleet and properties to become zero emission. We will continue to integrate carbon into our investment decision-making, aiming to reduce the embodied carbon associated with our investment delivery. We will work with our supply chain to reduce carbon in construction.

## Natural and social capital

We want our services to make a positive contribution to the natural and social capital of Scotland. To achieve this, we will work with partners to advance best practice in the use of natural capital concepts in decision-making. For example, we will work with partners to manage surface water through the use of blue-green infrastructure. This delivers not only more capacity in our sewers, but also local amenity and biodiversity benefits.

### Social sustainability

Social sustainability is about identifying and managing our impact, both positive and negative, on people. We play a vital role in communities across Scotland and we aim to strengthen the relationship we have with both local communities and communities of interest. For example, we will work with communities to support development in renewables, look at innovations to minimise the impact of road works, and involve communities in our decision-making, particularly within our capital programme.

### People and partnerships

We will continue to develop the skills and talents of our people, so that we remain an employer of choice in Scotland. We will develop our volunteering programme and continue to use partnership opportunities, like our existing Learn to Swim partnership with Scottish Swimming.

**This ambition  
will contribute  
to the following  
UN Sustainable  
Development Goals:**





## The water industry in Scotland

The water industry in Scotland is regulated. This model provides assurance that Scottish Water meets the interests of customers, protects the quality of drinking water and the environment, and is accountable for its performance.



### **The Scottish Parliament**

Holds Scottish Water and Scottish Ministers to account and regularly calls executives to its committees to give progress updates.

### **The Scottish Government**

Scottish Ministers set the objectives for Scottish Water and appoint the Chair and Non-executive Members.

### **Scottish Environment Protection Agency (SEPA)**

SEPA is responsible for environmental protection and improvement.

### **Drinking Water Quality Regulator (DWQR)**

DWQR is responsible for protecting public health by ensuring compliance with drinking water quality regulations.

### **Scottish Water**

Responsible for providing water and waste water services to household customers and wholesale licensed providers. Scottish Water delivers the investment priorities of Scottish Ministers within the funding allowed by the Water Industry Commission for Scotland.

### **Scottish Public Services Ombudsman (SPSO)**

SPSO is responsible for investigating complaints about public services in Scotland, including Scottish Water, once the services' complaints procedure has been completed and sharing lessons from complaints to improve the delivery of public services.

### **Water Industry Commission for Scotland (WICS)**

WICS is our economic regulator and sets charges, reporting on costs and performance.

### **Customer Forum**

The Customer Forum has been created to ensure that our customers have a clear voice in the business planning and price-setting process.

We are working with the Customer Forum on a programme of customer research so our plans truly reflect customers' views on future priorities.

### **Citizens Advice Scotland (CAS)**

CAS represents the interests of consumers within Scotland's water industry.

### **Other regulators**

Like other companies and utilities, Scottish Water is also regulated by a variety of other bodies such as the Health and Safety Executive (HSE), Environmental Health Officers and the Scottish Road Works Commissioner.

## Glossary

### Asset base

'Asset base' is a term to describe everything that makes up Scottish Water's physical structures, for example pipes, waste water treatment works, pumping stations.

### Blue-green infrastructure

Blue-green infrastructures are an important tool for managing storm water and reducing the amount of rainwater entering our sewers, by reintroducing a natural water cycle into towns and cities.

**Blue** refers to water (pools, ponds, water courses, artificial basins etc.) and **green** refers to green landscape elements such as hedgerows, trees, bushes, orchards, woodlands, swales and ecological parks.

Linking blue and green elements together, through land planning and engineering design, allows more rainwater to be naturally absorbed into the ground rather than entering the sewer system.

### Capital programme

This is the investment activities we undertake, it includes construction work such as laying pipes and building and upgrading treatment assets.

### Catchment management

Catchment management can be explained as prevention rather than cure - it refers to preventing pollution (such as agricultural pesticides) from getting into our water sources, rather than removing the pollution from the water at our treatment works. It is the most sustainable way to protect our water resources and is also beneficial to the environment.

### Circular economy

A circular economy is described by Zero Waste Scotland as 'businesses, industry and consumers working together to make things last'. In a circular economy, everything has value and nothing is wasted; things are re-made and re-used rather than disposed of.

### Civil contingency partners

Our civil contingency partners are organisations that would help us deal with any major incident. These would include organisations such as Local Authorities, Police Authorities, Scottish Ambulance Service, etc.

### Improvement priorities

We undertook extensive preparatory research in order to find the best way to gather customers' views. Based on this research, we developed a new 'impact' based visual survey, to enable customers to easily understand the different aspects of the service we provide, and how these impact on them and their daily lives. We used this research to develop our customer priorities, which will help inform our business plan.

### Ecological footprint

The ecological footprint measures human demand on nature. It is defined as the biologically productive area needed to provide for everything people use.

### Hydraulic modelling

A hydraulic model is a mathematical model of a sewer system which is used to analyse how the system behaves.



### **Integrated catchment studies**

Integrated catchment studies involve Scottish Water, SEPA and local authorities working together to address the problem of surface water flooding. These studies use modelling to assess the relationship between rainwater flooding, sewer catchment, rivers and tidal waters. The results of these studies are used to inform how that area will manage its surface water in future.

### **Lean management**

Lean management is a management method that aims to improve the performance of an organisation by developing all of its employees. It aims to create better value for customers, using fewer resources.

### **Natural capital**

Natural capital can be defined as the world's stocks of natural assets which include geology, soil, air, water and all living things.

### **Revenue base**

An organisation's revenue base is the source of the major and regular part of its income.

### **OECD**

The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental economic organisation with 35 member countries, founded in 1961 to stimulate economic progress and world trade.

### **Organic matter**

The organic matter in soil comes from plants and animals. Peaty soils have a high concentration of organic matter.

### **Social capital**

The links, shared values and understandings in society that enable individuals and groups to trust each other and work together.

### **Social sustainability**

This is about identifying and managing our impact, both positive and negative, on people.

### **Source control**

In this context source control is used to stop pollutants or contaminants from entering the environment by preventing the release or disposal of chemicals, rather than removing the substances from waste water or the environment at a later stage. This could include working with customers to discourage inappropriate disposal of products into the sewer system.

### **Surface water**

Water that flows or collects above the surface of the ground, this can originate from groundwater, small urban water courses, rainfall or sewers.

### **Storm water**

Water that originates during precipitation events. Storm water can soak into the soil, be held on the surface and evaporate, or run off and end up in nearby streams, rivers, sewers or other water bodies.



**Scottish  
Water**  
Trusted to serve Scotland

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**[www.scottishwater.co.uk](http://www.scottishwater.co.uk)**

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