



**Scottish
Water**
Always serving Scotland

Always Serving Scotland Business Plan 2015 to 2021



Our timeline

October-November 2012

WICS provides preliminary views on regulatory inputs

14 November 2012

Your views count
consultation starts
and Draft Strategic
Projections published

12 February 2013

Your views count
consultation closes

December 2013

WICS, Scottish Water,
the Customer Forum,
SEPA and DWQR
start tri/quinti-
partite meetings

Scottish Water and the
Customer Forum start
customer engagement

January 2014

WICS, Scottish Water,
the Customer Forum,
SEPA and DWQR
end tri/quinti-
partite meetings

March 2014

Business Plan
2015-21

June 2014

Consultation
on WICS' Draft
Determination closes

October 2014

WICS publishes its
Final Determination

March 2015

Scottish Water
publishes its Delivery
Plan for 2015-2021

March 2014

WICS publishes its
Draft Determination
for consultation

June 2014

Scottish Government
publishes its final
objectives, principles
of charging and
technical expression

December 2014

Scottish Water decides
whether or not to accept
the Final Determination

1 April 2015

New price limits
come into effect

Your future water and waste water services

We have set out in this document our plan to deliver a leading service to our customers over the 2015 to 2021 period.

Since we published our draft plan in October 2013, we have engaged extensively with the Customer Forum and other stakeholders to reach agreement on our business plan. We are grateful for the insights provided by the Forum and stakeholders in reaching agreement on a plan that delivers for customers, the environment and Scotland.

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Foreword

Everyone in Scotland should receive a safe and reliable supply of drinking water and have their waste water collected and safely returned to the environment for the lowest sustainable cost.

This document sets out our plan for 2015 to 2021 for ongoing efficient delivery and improvement of our services in priority areas that will give our customers a leading service experience. It delivers the first steps of our strategy for future water and waste water services as set out in our strategic projections, **Your future water and waste water services – October 2013** preparing for the key challenges and opportunities facing Scotland's water industry, such as climate change.

This plan builds on the transformation in service levels and efficiency that we are proud to have delivered over the past 12 years for our customers. We are now delivering services that are comparable with the best companies in the UK at an average cost to household customers of over £50 a year below the average in England and Wales.

Our plan has been informed by extensive research with our customers, discussions with the Customer Forum and our stakeholders and the responses we received to our **Your Views Count** consultation on shaping the future of your water and waste water services.

We have worked closely with the DWQR, SEPA, Consumer Futures and the Scottish Government on the preparation of this plan. Working in partnership with them has meant that we have been able to clearly define the investment requirements necessary to meet our statutory obligations and other priorities in relation to water and waste water services. We will continue to work with our statutory partners in the Output Monitoring Group, established by Scottish Ministers, to monitor the delivery of this plan.

We have been pleased to work with the Water Industry Commission for Scotland on developments to the approach for setting prices. We have embraced their innovative proposal to involve customers in agreeing our business plan through the formation of the Customer Forum and welcome the ability to explore greater innovation through the introduction of the rolling investment review process.

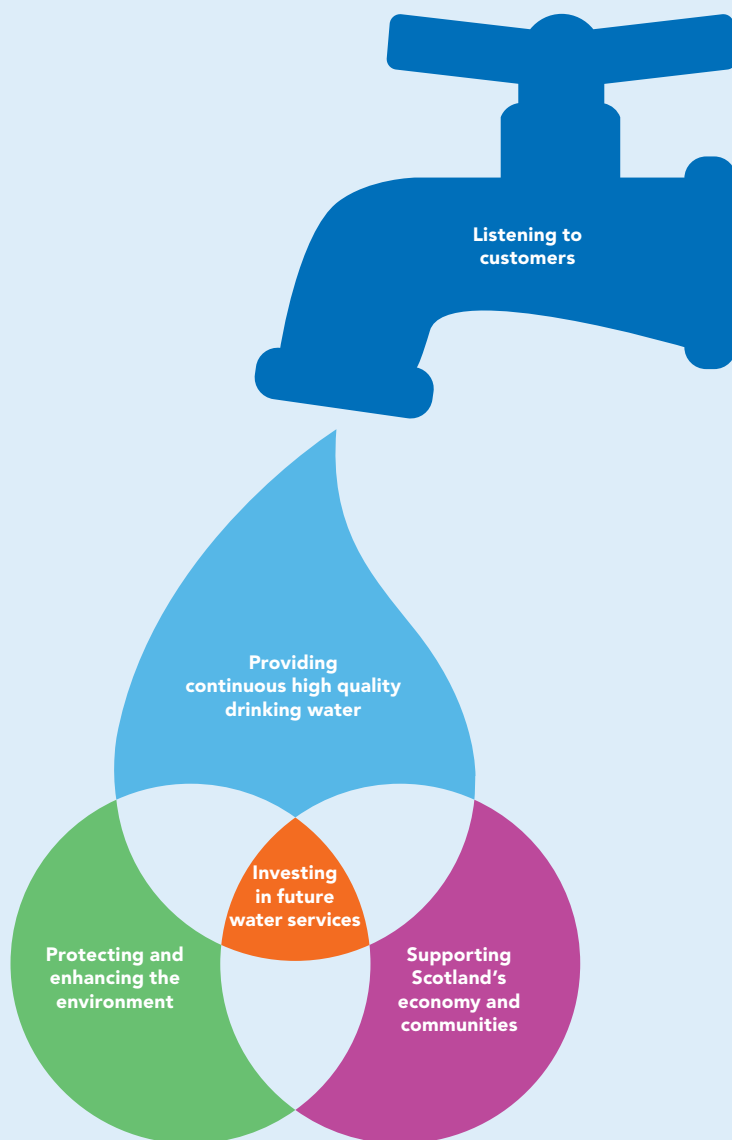
We found the insights of the Customer Forum very informative in reaching an agreed plan, and we value the additional complementary research that the Customer Forum undertook which has given a deeper understanding of customers' views in relation to the balance between charges and service improvement levels.

This agreed plan meets the expectations of customers in terms of level of service and prices for the period 2015 to 2021 as agreed with the Customer Forum. The Minute of Agreement appended to this plan sets out the key changes from our Draft Business Plan in reaching agreement with the Customer Forum.

We refer to the Customer Forum throughout this document in matters beyond the current process for the price review and current powers to agree the business plan. This reference is not intended to imply that a decision has been taken on the future of the Customer Forum and any future role it may have. This is simply a short-hand for consistency and identifies areas where customer input to discussions and arrangements will be appropriate and important, whatever the particular form of that customer body.

Overview

Our vision and long term strategy



Customer expectations

Customers, both households and businesses, rightly 'take for granted' that they will always have a safe and reliable supply of high quality drinking water and that their waste water will be taken away and returned safely to the natural environment. Customers do not want us to compromise on delivering existing service levels.

Customers also wish us to further improve services and provide a leading customer experience, but to manage the rate of service improvement so that prices are stable, predictable and rise by less than inflation.

Always serving Scotland

Our strategic projections, **Your future water and waste water services** set out our long term plans for delivering services to customers over the next two to three decades.

Implementing these strategic plans will support achievement of our vision to become Scotland's most valued and trusted business. Our vision recognises customers' fundamental trust that we will always deliver valuable services that are essential to their lives and businesses.

Our plan for 2015 to 2021

High quality service

We will continue to deliver high service levels during 2015 to 2021 so that both household and business customers continue to receive a water and waste water service that is among the best provided across the UK, improving service in all their priority areas.

Service to Licensed Providers

We will continue to listen to the needs of Licensed Providers as the UK retail market develops, and adapt our services to meet their needs.

Innovation

Our plans are based on a detailed assessment of the most cost effective way to deliver customers' expectations and improved compliance. These involve both innovative and proven approaches to operating and investment solutions. Our detailed studies and investigations have enabled us to avoid extensive investment where there would be no clear benefit. We will use the IR18 investment review process to address emerging priorities or requirements arising through innovation outcomes.

Customer experience

We will further improve customers' experience of their service from us so that it is as good as that provided by leading suppliers of other essential products and services. We will monitor our customer service through the Overall Performance Assessment, enhanced household and business Customer Experience Measures and we will implement with the Customer Forum and Licensed Providers further measures of service and an annual performance review meeting with the Customer Forum.

Delivering value

We will build on our leading levels of employee engagement to continually improve the effectiveness and efficiency of our service delivery to customers.

Risk

Inevitably, circumstances in the 2015 to 2021 period will vary from those set out in this business plan. In 2010 to 2015, overall favourable circumstances and business out-performance enabled us to both reduce customer prices and new government borrowing. In 2015 to 2021, actual circumstances may require greater or lesser financial resources than assumed in this plan.

Household prices

We are committed to annual household prices which increase by 1.6% for 2014/15 to 2017/18. Thereafter prices will be set to achieve an overall price charge of CPI – 1.75% across the 2015 to 2021 period. This will be achieved by delivering further significant efficiencies and will keep charges significantly lower than the average in England and Wales.

Wholesale charges

A revenue cap will be set for wholesale customers, based on target annual increases at 0.3% below CPI. This will protect household customers from revenue uncertainties in the business customer market and provide a further incentive to Licensed Providers to introduce new customers.

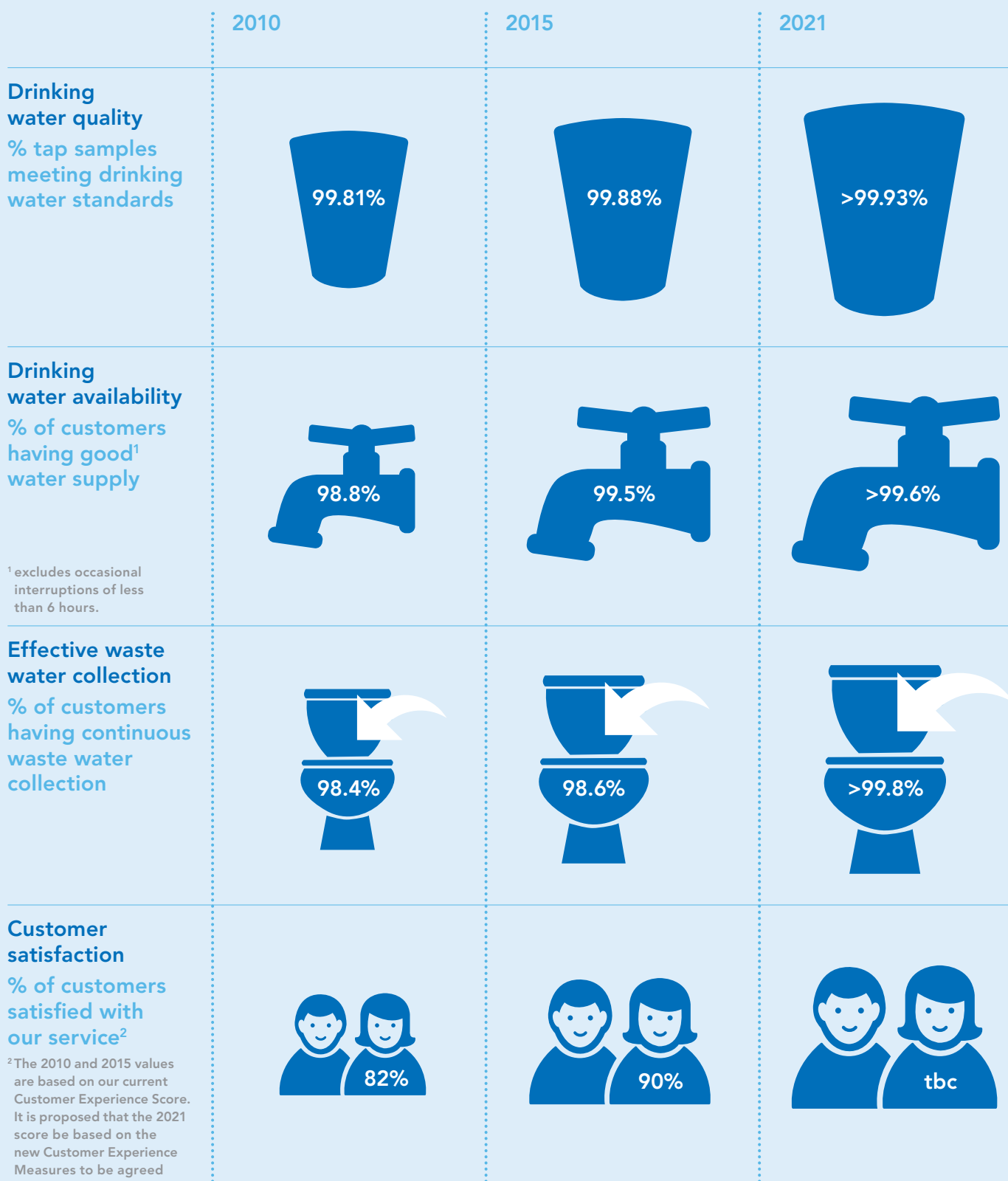
Financing

The financing of this plan will require £720 million of new government borrowing. Financing this plan with our proposed mix of customer prices and new borrowing will enable us to maintain our financial strength.

Out-performance

We will endeavour to out-perform this plan. We propose that any savings arising from out-performance are held until 2018 to support the ambition of annual nominal household prices increases of 1.6% from 2018 to 2021 and/or investment in further improvements to improve the resilience of water supplies and to reduce the risk and incidence of sewer flooding. These would be agreed at the time with stakeholders and the Scottish Government.

Figure 1 – Benefits of this plan



Putting customers at the heart of our plans

Listening to customers' views and building these into our plans is part of an ongoing customer engagement approach that allows Scottish Water to ensure that our customers' needs are at the heart of our service delivery.

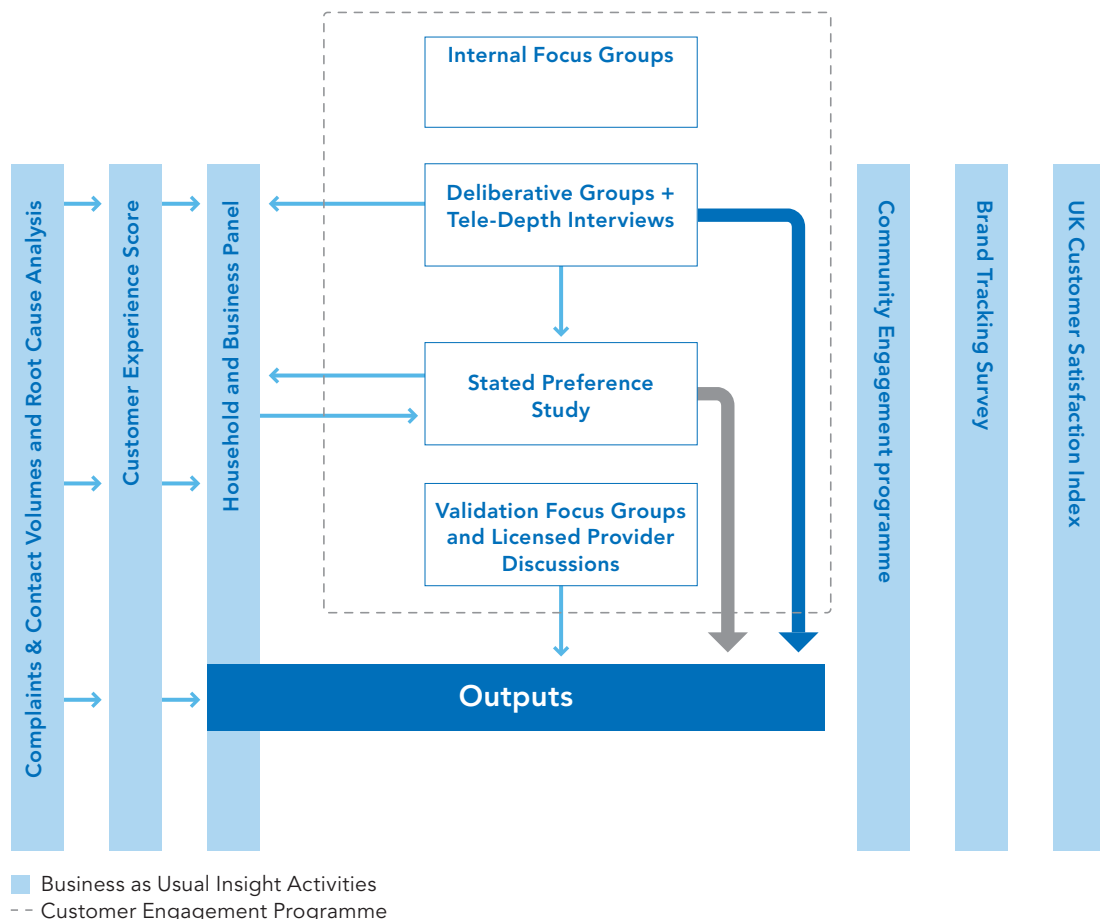
We have undertaken an extensive customer research programme which involved targeted research activities, speaking with our customers to find out what they think, listening to our customers' views and building this into our plans. Findings from the research show that overall, both household and business customers generally have positive perceptions of Scottish Water, even though their relationship with the brand is often a distant one.

The drinking water provided in Scotland is perceived to be of a superior quality to much of the rest of the world, and waste water services are conducted invisibly.

Customers generally view the services they receive from Scottish Water as representing good value for money. However, as Scottish Water does not bill its household customers directly, there is a low top of mind awareness of charge levels. Business customers are generally more price aware, and rainwater charges from both buildings and roads drainage caused a great deal of discussion regarding who should pay. Small businesses are concerned about the relatively high fixed charge element of their bills.

Unprompted feedback throughout the Customer Engagement Programme has shown that customers are keen to maintain the service levels they currently receive. As most customers experience 100% service reliability, and trust that they will continue to receive this, there is a lack of knowledge or understanding regarding many of the more complex aspects of the water and waste water services provided by Scottish Water.

Figure 2 – Listening to our customers



In both the unprompted and quantitative research, household customers showed a willingness to invest to prevent service failures that may affect other customers or the wider environment.

The following summarises our understanding of customers' expectations of Scottish Water:

- Customers trust that they have a safe and reliable supply of drinking water and expect us to maintain current high standards.
- Customers expect that their waste water will be taken away and returned safely to the environment.
- Customers want the level of visible leakage reduced, but were not willing to pay extra to achieve this, and expect that repairs are carried out quickly.
- Both household and business customers have demonstrated that they have no desire to see service levels reduce in any area, and overall show desire, and place a value on, further service improvement once prompted with information about specific service areas.
- Customers want us to be more proactive in providing information about our Price Promise and Guaranteed Service Standards.

Some business customers raised tariff structures as an area for improvement.

Customers recognise that the quality of drinking water is high, and whilst investments are required in other areas to improve services, this should not be at the expense of drinking water quality.

Most of our customers currently receive 100% service reliability from Scottish Water. However, there are occasions when issues arise. In relation to specific areas for service improvement research from both business and household customers findings show that:

- Minimising interruptions to water supplies is an important issue for customers due to the inconvenience that this may place on daily life, with long term interruptions having greater impact than short term interruptions. For certain business customers this would be a top priority due to their business being dependant on water to operate. Long term interruptions to supply due to extreme weather were thought to be difficult to prevent, but there is an expectation that Scottish Water should plan ahead to avoid or minimise the impact of these events.

- Reducing internal property flooding from sewers is consistently a high priority for improvement.
- External flooding represents one of the highest volumes of contact received by Scottish Water, and customers who discussed this issue in qualitative research expected Scottish Water to take steps to reduce its impact both in terms of the overall number of customers affected and those impacted by recurring issues.
- Despite the low levels of customer contacts relating to pollution incidents, this is viewed as an area for improvement, with a focus to be placed on the more serious 'category 1' incidents.
- Reducing discolouration (the appearance) and poor taste or odour from drinking water supplies is a priority for improvement as these give concern to customers that water quality has been compromised.
- Coastal and inland bathing water quality is an important issue driven by the pride customers have in Scotland and its natural environment, but a relatively lower priority for improvement for customers who rarely bathe in Scotland's water bodies.
- There was high agreement that everyone should be striving to cut down their carbon emissions, and therefore customers, in particular business customers, liked the idea of Scottish Water aiming to lower its carbon footprint. Customers expect Scottish Water to strive to be a climate champion and make a sustained effort towards reducing and mitigating the risks arising from climate change.
- While customers are keen for improvements to river water quality they thought that Scottish Water should prioritise investment where it will have the biggest impact on the river, and expect that other individuals or businesses should also address their environmental impact.
- Low pressure was of lower priority to both customer groups, with many feeling that those affected still receive a level of service and the issue would be more of an inconvenience than have a significant impact on daily life.

- Odour from waste water treatment facilities was also seen as a relatively minor issue, as it was considered to be primarily a temporary issue for those affected. However, we know that this can be a major concern for any community affected by malodour.
- Customer service was viewed as an important element, but customers are not willing to pay Scottish Water more to improve this as they expect good customer service as a matter of course.

We carried out research with secondary school pupils, our customers of the future, to understand their views. The research revealed that our customers of the future felt that we should be striving to become a climate champion and make a sustained effort towards combating climate change, and that innovation was necessary as a driver of progress.

Further details can be found on our website in the reports titled 'Listening to our Customers', November 2012 and 'Listening to our Customers: Phase 2', April 2013.

Your Views Count

Our draft strategic projections consultation, **Your Views Count**, which ran from November 2012 to February 2013, revealed that the majority of customers who responded wished to see ongoing improvements to services with prices that rise in line with inflation over the longer term.

Customers ranked improvements to services as follows:

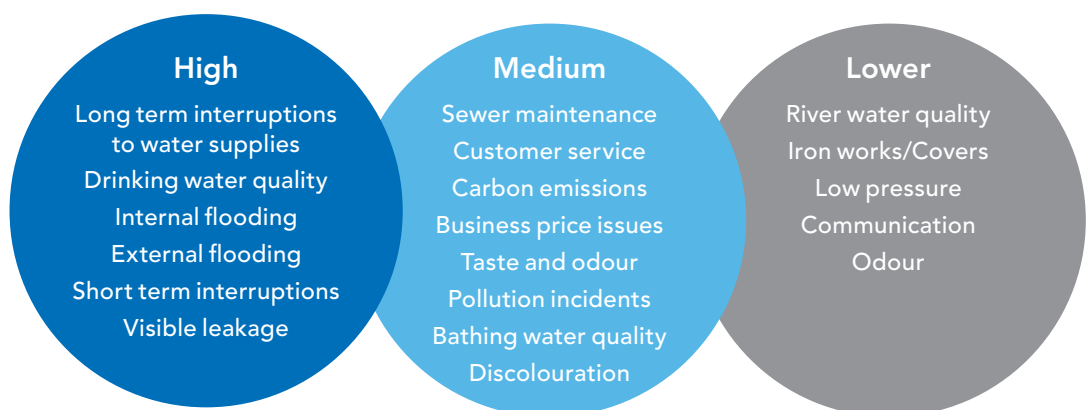
1. Avoiding interruptions to supply that could last longer than a few days;
2. Reducing the internal flooding of properties from sewers towards zero;
3. Reducing external flooding of properties; and
4. Improving the speed of our response on occasions where services are interrupted.

Through this extensive research customers have informed us that their priorities for further service improvement are as shown below.

On-going engagement

We are committed to working with the Customer Forum on deepening customer engagement. We will agree an annual programme of research with the Customer Forum which will include research into understanding the needs of vulnerable customers, customers within particular geographical areas and customers with particular service improvement needs. Engagement areas will also include lead pipe replacement, rural sewerage provision and private water supplies.

Figure 3 – Customers' relative priorities for further service improvements



Sustaining existing high service for customers

In our research, customers have told us very clearly that we must not compromise existing service levels. Our first priority is therefore to sustain the high service levels we will be delivering in 2014/15 throughout the 2015 to 2021 period.

How we provide our services

Water service

To provide water supplies we abstract water from lochs, reservoirs, rivers, boreholes and burns. We treat these source waters at water treatment works to remove impurities to provide safe drinking water. We then distribute this high quality treated water through an extensive network of pipes, pumping stations and storage tanks for customers to use for drinking, cleaning, recreation, gardening, or in business processes.

Waste water service

Our drainage services involve collecting rainwater from customers' roofs, paved areas and some roads on behalf of local councils (surface water) and collecting domestic sewage and commercial and industrial discharges (waste water). We convey this through a network of pipes, pumping stations and storm tanks before treating it at waste water treatment works and discharging it back to a water body (river, sea or loch). Within the collection system, there are storm overflows which discharge untreated combined waste and surface water to water bodies during periods of heavy rain – this is to prevent the sewer network from being overloaded and causing flooding.

Our treatment of water (both raw water and waste water) creates a sludge waste, which we treat further and condition to allow the majority to be recycled with a small proportion disposed of to landfill.

Figure 4 – How we supply water to customers' properties

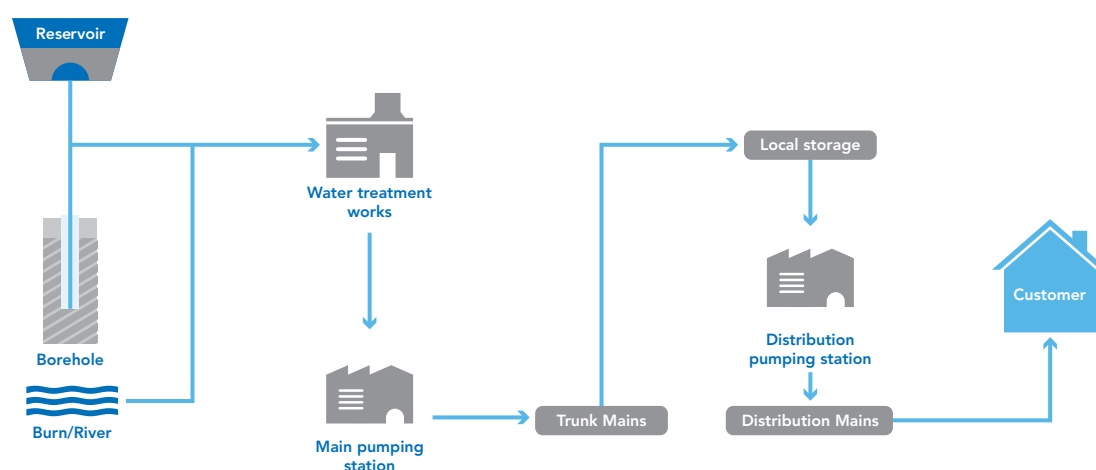
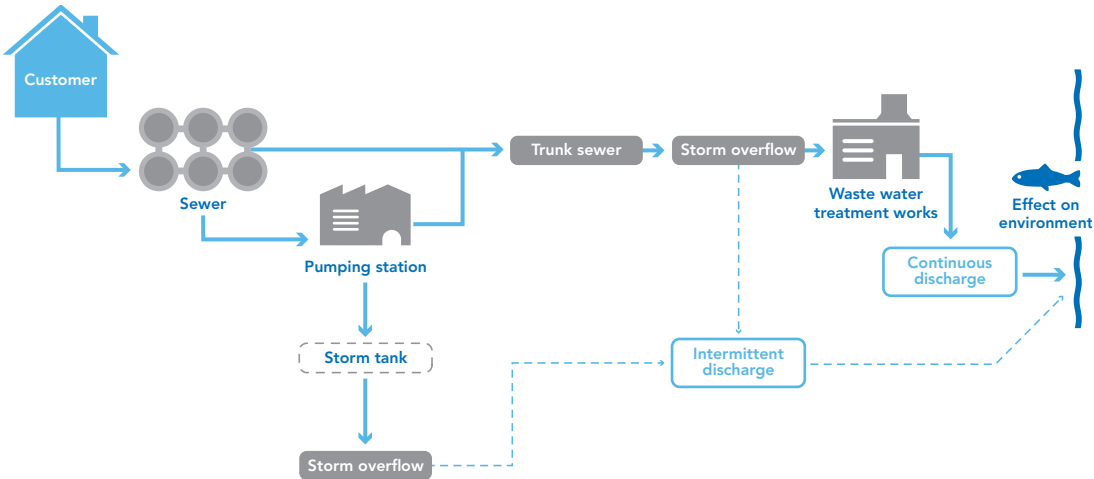


Figure 5 – How we collect and treat your waste water

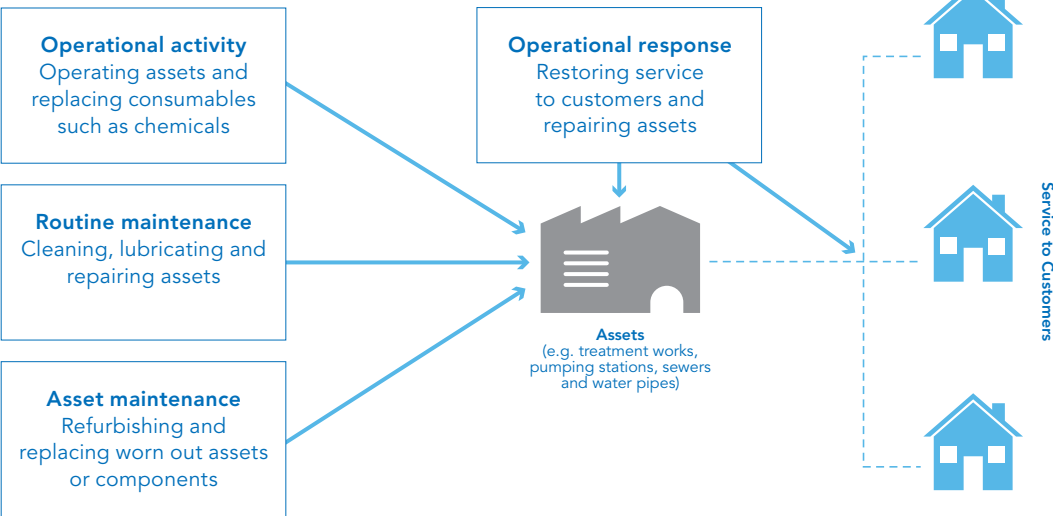


Our plans to sustain high service

Most of our customers never experience an interruption to the services they receive and rightly trust this will continue. Our plan will, as a minimum, maintain the current service risk profile to sustain the high levels of service we will be delivering in 2014/15 throughout the 2015 to 2021 period. We will further improve services in areas identified as priorities by customers and these improvements are covered in the section 'Improving our services for customers'.

Our service to customers is principally delivered through the effective operation and maintenance of our assets such as water and waste water treatment works, pumping stations, water mains and sewers. The effective delivery of high levels of service requires the right balance between operational activity, routine maintenance, operational response and asset maintenance as shown in Figure 6.

Figure 6 – Activities to sustain high service for customers



Operation of our assets

Our operational strategy is to make proactive and preventative interventions that ensure our customers receive continuous services. Every day our employees manage and optimise our treatment works and networks to ensure that we will deliver our services to meet customer expectations and the required legal standards. Some assets only require periodic interventions to sustain high service levels, others require intensive management. Although our aim is to provide continuous high quality services occasionally our customers experience issues with their services. In these situations we aim to resolve these leaving our customers fully satisfied that we have done everything possible to provide a leading service experience.

Efficient and effective operation of our assets requires the development and introduction of new technology, innovative ways of working and most of all the commitment of our people, both those directly employed and those engaged through partnerships and contract relationships. The commitment of our workforce is reflected in our leading scores in employee engagement and was recognised in 2012 when we won the award for Best Scottish Workplace.

We will continue our emphasis on leadership development and staff engagement that has led to a virtuous circle of increased employee engagement, leading to improved performance and customer service, resulting in improved customer satisfaction and engagement, which reinforces employee engagement.

Innovation in action:

Regular blockages at waste water pumping stations, due to the accumulation of rags (wipes, sanitary products) and fat, oils and grease, result in increased maintenance activity, inefficient operation and in extreme circumstances localised flooding. We have worked with a local supplier to develop a low cost pump control system that identifies when pumps are starting to rag. The control system runs the pump in reverse to clear the blockage and then runs the pump at full flow to flush the system. This system has been installed at a number of sites across Scottish Water resulting in reduced attendance to clear blockages and reduced energy consumption as the pump runs more effectively without material build up on the pump impellers. We are exploring opportunities with the supplier to introduce a variation on this across other sites.

Figure 7 – Improving customer satisfaction



Our new Intelligent Control Centre uses technology to allow us to sustain high quality services, by pulling together information to identify potential problems and take action before they affect service to our customers, through our leading use of information systems. The planned development of further intelligent controls during 2015 to 2021 will support our aims of moving to an ever more planned approach to both operation and operational maintenance, and allowing greater remote control of assets.

Routine maintenance of our assets

Many of our assets such as treatment works and pumping stations require operational maintenance including cleaning, lubricating and minor repairs. Without this routine maintenance the assets would not last as long and require replacing, very similar to good maintenance of a car.

Operational response

At all times we focus on sustaining high services to customers. Despite good operation and maintenance practice there are times when incidents arise as a consequence of an asset failure, such as a burst water main causing a potential interruption to supply. Our priority is always to seek to maintain service to customers or, if this is not possible, to provide a fantastic recovery service that minimises the disruption and gives the customer an excellent service experience.

Operational response starts from when the issue is identified, whether by our control systems or by customers through our contact centre.

Innovation in action:

Our focus on improving customer satisfaction has led to significant innovations in the waste water service area delivering higher customer service and improved efficiency. We attend around 2,700 sewer flooding issues a month, caused by blockages in the sewer, and 30% of these recur within 12 months. A reactive response clears the issue but doesn't always resolve the root cause, due to lack of visibility of recurrence information. Our staff developed new systems and processes that would identify recurrent issues in both the contact centre and by the response team. New CCTV equipment was provided to the response teams to allow root causes to be pinpointed and addressed. This has reduced the costs of service failure and increased customer satisfaction.

Innovation in action:

To deliver leading levels of service to our customers our primary focus has shifted from repairing burst pipes to maintaining supplies for customers, even when the water main has burst. This has resulted in some new approaches being deployed in Scottish Water.

These include:

- Using overland connections to bypass the burst and keep the majority of customers in supply;
- Deployment of new tools to significantly reduce repair times;
- Development and deployment of response trailers with the appropriate equipment to maintain water supplies;
- Use of special fittings that allow the burst in the main to be repaired quicker without turning off water supplies; and
- Use of a Smart Actuator that allows failed valves to be made operational again.

Asset Maintenance

Effective asset maintenance is an essential foundation for maintaining the current service risk profile and delivering high quality service to customers.

Scottish Water manages over £58 billion of assets to provide customers' water and waste water services. Around £10 billion of these assets are treatment works and pumping stations, about 50% of which have been built in the last 20 years.

Assessing asset maintenance demand

To assess our required asset maintenance investment for 2015 to 2021 we have used asset management modelling techniques and detailed assessments. We have validated the output in these models and assessments with the predicted demand from asset life models and trends from similar operations in England and Wales.

Our industry leading asset management models have been developed by our in-house teams in partnership with Edinburgh and Glasgow Universities and used to model the deterioration of our assets and their impact on service.

Forecast capital maintenance requirement

Our asset maintenance costs are rising and are forecast to do so over the next 10 years. This investment will sustain the significant improvements we have made to customer service and statutory compliance over the last 12 years resulting from the extensive investment made over the past 20 years.

Our assessment indicates capital maintenance demand will increase from £272 million per year in 2012/13 to £285 million per year in 2020/21, an average of £280 million per year over the 2015 to 2021 period.

Innovation in action:

We are continually assessing and deploying new techniques to more accurately locate potential leaks in our water supply network, allowing early intervention before supplies are interrupted and speeding up the repair process. We use non-destructive testing devices in live water mains to allow the integrity of the pipe walls to be inspected and pipes repaired before services are interrupted or leaks begin.

Innovation in action:

To sustain high service levels we need to move even more to the planned and predictive maintenance of our assets. In support of this we are introducing condition monitoring technology, widely used in manufacturing and petro-chemical industries, to reduce the number of unscheduled plant shutdowns that can affect service to customers. We expect that condition based monitoring and intervention will also, in the longer term, reduce the costs of routine maintenance of our assets by reducing the number of visits and manual inspections.

Sustained high service

Our overall service is currently measured by the Overall Performance Assessment (OPA score) which reflects service across 17 measures. In 2012/13 we achieved an OPA score of 368 and we plan to improve this to above 380 by

2014/15, which will be among the leading performances across the United Kingdom. The table below summarises the service levels, for each key service measure and OPA, we expect to achieve by 2015 and, as a minimum, sustain during the 2015 to 2021 period.

Table 1 – Service measures to be sustained as a minimum during 2015 to 2021

Service measure	Expected minimum service levels for 2015 to 2021
Water service	
Drinking water quality compliance at customers' taps	99.88%
Number of properties affected by unplanned water supply:	
> 12 hours	< 1,000
> 6 hours	11,000 – 15,000
Discolouration complaints	8,000 – 10,000
Taste complaints	4,000 – 5,000
Properties below reference level for pressure	80 – 120
Security of supply index	86 – 91
Leakage (MI/day)	570 – 600
Waste water service	
Number of properties at risk of internal flooding	340 – 370
Annual number of incidents of internal sewer flooding due to blockages and failures (all sewers)	600 – 700
Annual number of incidents of internal sewer flooding due to overloading (all sewers)	64 – 72
Number of properties at risk of external flooding	tbc
Annual number of properties externally flooded due to blockages and failures (all sewers)	12,000 – 14,000
Annual number of incidents of external flooding due to overloading (all sewers)	tbc
Number of failing waste water treatment works	0 – 2
Number of pollution incidents	310 – 330
% sludge disposed of satisfactorily	100%
Customer service	
Customer satisfaction score ³	90%
Wholesale service key performance indicator	98%
Customer service	
OPA	380 – 400
Carbon footprint (kg/household)	125

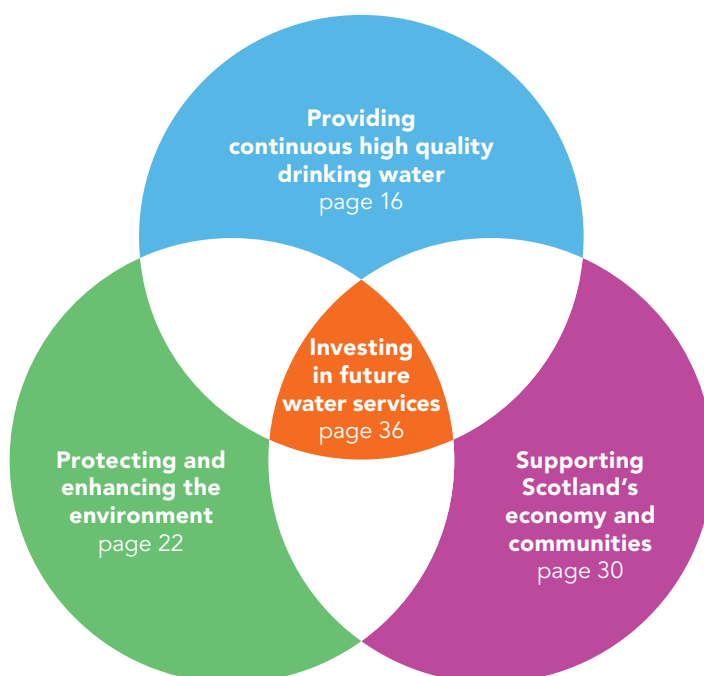
³ To be replaced by the household and business Customer Experience Measures.

Improving our services for customers

Our strategy

We believe that everyone in Scotland should receive a safe and reliable supply of drinking water and have their waste water collected and safely returned to the environment. We aim to be the most valued and trusted service provider, deliver ever improving value for money and support Scotland's economic growth.

Building on our successes over the past 12 years, our strategies are geared to help us achieve these aims and further improve our performance and efficiency. In developing these strategies we have considered the potential future opportunities and challenges and our customers' views as set out in our strategic projections, **Your future water and waste water services**.



This section sets out the improvements we plan to make to our services to meet our customers priorities and the statutory obligations set out in the Ministers' draft objectives statement of September 2013.

We have worked closely with all stakeholders through the Quality & Standards process to understand the investment needs and priorities, ensuring that the needs are robust and where appropriate supported by customer research. Ministers' draft objectives and the Technical Expression that underpins our statutory obligations have been agreed with the Scottish Government, Consumer Futures, the Scottish Environment Protection Agency (SEPA) and the Drinking Water Quality Regulator for Scotland (DWQR).

The improvements to meet statutory obligations have been discussed with the Customer Forum and overlap with customers' priorities for service improvement, particularly in the area of drinking water quality. Our extensive customer research and engagement with the Customer Forum have informed our plans for further service improvement that will move us to a more proactive and preventative approach to managing service that will lead to higher overall service levels aligned to customers' expectations.

The mix of improvement costs across the different areas of our services is shown below with 78% of planned investment in the period being fully committed and 22% subject to further review in December 2017 as part of the rolling investment review (IR18).

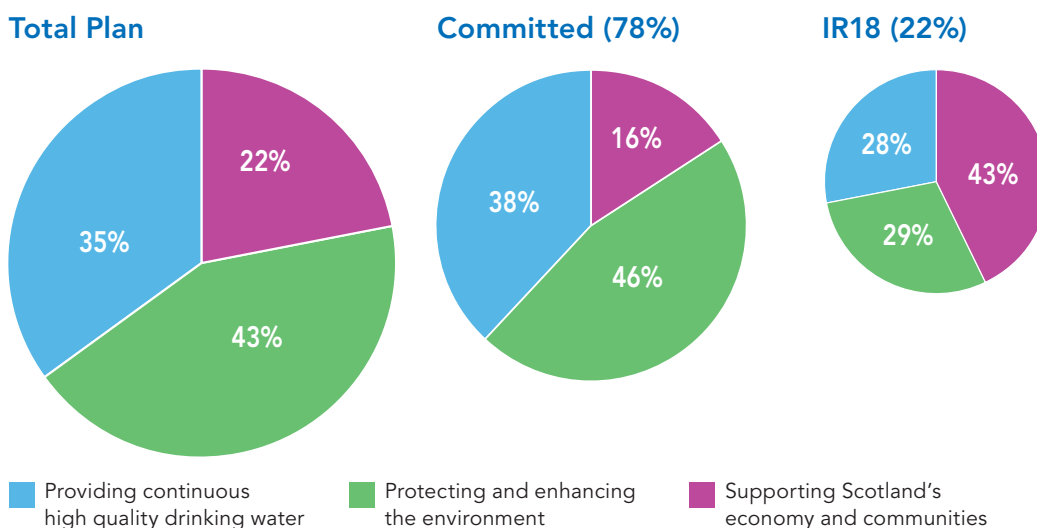
Rolling investment review

As part of the methodology for the 2015 to 2021 price control, we have agreed changes to the planning process with the Water Industry Commission, Quality & Standards stakeholders and the Customer Forum that will encourage greater flexibility in the process. Under this approach, investment plans will be updated on a 'rolling' basis at 3 yearly intervals, allowing a more stable investment profile to be developed, with the prospect of continuous investment period to period. This effectively removes the need for Scottish Water's investment plan to be fully specified for the full duration of the next regulatory control period and avoids 'locking in' solutions too early and constraining potential innovative solutions.

This approach is intended to bring benefits for customers by providing greater flexibility in meeting existing and emerging priorities, a better environment for adopting innovative approaches, a more efficient (smoother) delivery profile between regulatory periods, and facilitating longer term strategic solutions. It will also allow opportunity to address changes to priorities that emerge in the 2015 to 2021 period due to new legislation or a changing water environment and for customers to be represented in decisions regarding the next rolling update and the balance between investment and prices.

In the tables in this section we have set out the allowances (IR18) that will be reviewed at the next rolling update in December 2017. In total this amounts to £286 million in the 2015 to 2021 period with an ongoing commitment of around £291 million investment completion in the 2021 to 2027 period.

Figure 8 – Breakdown of service enhancement investment



Providing continuous high quality drinking water

Our strategy at a glance

Scottish Water customers are receiving the highest ever level of drinking water quality thanks to significant investment. But we need to do more to ensure we meet our statutory obligations in future. That's why we want to improve water quality even further while ensuring every customer can always receive a safe and reliable supply of drinking water.

Our strategy to improve water quality:

Scottish Water will monitor and maintain its network to provide high quality drinking water. We will work to protect our water sources from pollution and, where necessary, invest in new treatment works and pipes to meet statutory drinking water standards, to improve the look and taste of water and address the challenge of climate change.

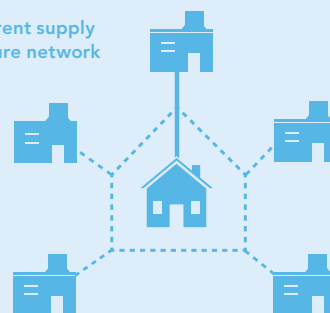
Our strategy to supply water whenever and wherever it is required:

The challenges of climate change and population growth may increase the likelihood of a long term (more than a week) interruption to customers' water supply.

We will take steps to ensure that all customers, regardless of where they live, are always able to turn on their taps and receive the best possible water.

Improving long term resilience could be achieved by importing water using road tankers in extreme circumstances and creating new links between supply systems for larger communities. This will help ensure we can always provide our customers with water if there is a problem with their normal supply.

Key
— Current supply
-- Future network



Scottish Water is developing better links between our water treatment works to enhance the resilience of water supply to our customers' properties.

We will work to reduce water leaks from our pipes and encourage customers to use water wisely – recognising that water is a precious resource.

Our plans to improve drinking water supplies in 2015 to 2021

We set out in this section the planned improvements for providing our customers with a safe and reliable supply of drinking water. These improvement areas align with customers' priorities and have been agreed with DWQR, where appropriate, and discussed and supported by the Customer Forum. Table 2 summarises the investment we propose to make to provide continuous high quality drinking water.

Improving drinking water quality

The most recent DWQR report shows 99.86% of samples from customers' taps met the required standards – the best ever compliance level. We recognise this can be improved further, particularly in addressing impurities that occur naturally in the environment, further enhancing some treatment works and replacing iron water pipes.

Ministers' draft objectives require us to address all known areas of non-compliance

with our statutory obligations. Following engagement with the Customer Forum and the DWQR, our plan also includes actions to address identified risks to future drinking water quality compliance that moves towards more proactive and preventative approach to improving the reliability of drinking water quality. While this plan reduces risks to drinking water quality in line with the World Health Organisation approach to drinking water safety plans, it will not eliminate all risks as explained in the appendices to this plan.

Our plan has been informed by investigations into previous exceedances of the water quality standards, our ongoing water quality monitoring at treatment works, and our drinking water safety plans. The required improvements have been reviewed and agreed with DWQR. For each issue we have studied all the available options to identify the lowest whole life cost solution.

Table 2 – Summary of proposed investment to improve water service

Service area	Improvement programme	2015 to 2021 Capex £m (2012/13 prices)		
		Committed	IR18	Total
Improving drinking water quality	Improvements to compliance required by DWQR to improve supplies for over 1 million customers	177.9	42.0	219.9
	Improvements supported by the Customer Forum and DWQR to improve reliability of drinking water quality for up to 3 million customers	98.9	21.3	120.2
	Sub total	276.8	63.3	340.1
Improving the availability of drinking water	Improvements required by Scottish Government to meet security requirements	9.5	2.6	12.0
	Improvements supported by the Customer Forum	103.3	13.5	116.8
	<i>Improved drought resilience for 47,000 customers (SOSI)</i>	24.0		24.0
	<i>Critical asset risk – reservoirs</i>	18.6		18.6
	<i>Water supply resilience strategy and improvements</i>	54.8	12.1	66.9
	<i>Understanding water pressure level of service and improving where appropriate</i>	0.5	1.5	2.0
	<i>Improve response times to reduce average duration of short term interruptions to supply</i>	4.6		4.6
	<i>Improve response times to reported visible leakage from 3 days to 1 day</i>	0.0		0.0
	<i>Water efficiency advice</i>	0.8		0.8
	Sub total	112.8	16.1	128.9
Total		389.6	79.4	469.0

Our plan adopts a mix of innovative and proven solutions. We have included operational solutions such as mains flushing to remove iron and manganese deposits that are affecting water quality at customers' taps and sustainable land management activities to manage the impact of catchment run-off on our raw water sources. We have also included innovative asset solutions such as reservoir mixing to control manganese levels entering our treatment works which, if successful, will avoid the need for additional investment to upgrade treatment works. We expect the IR18 investment review to consider the success of these innovative approaches and prioritise any further investment where appropriate. However there are situations where the only effective option is to build additional or new treatment works, or replace or reline water mains, to achieve the water quality standards that our customers expect.

Improvements to statutory compliance required by DWQR

We propose to incur expenditure of £340.1 million in the 2015 to 2021 period improving and protecting drinking water quality. Of this, £177.9 million is for confirmed solutions to address statutory improvement requirements for:

- 26 water supplies that do not comply with current standards serving 534,000 (11%) customers;
- Rehabilitating 397km of water mains and cleaning 1,216km of water mains confirmed as causing non-compliance serving 647,000 (13%) customers;
- 12 supplies commenced in the 2010 to 2015 period under Q&SIIb that will improve supplies for 205,000 (4%) customers; and
- Replacing around 6,500 lead communication pipes to ensure compliance with lead standards and respond to customers' requests to remove lead.

We have only committed to investment solutions in this plan once all available options have been studied and we understand the cause of non-compliance.

There are two sites that are a priority for improvement, where the investment is ring-fenced to allow confirmation of the proposed solution. There are four other sites where we wish to undertake further investigation into the causes of the non-compliance to confirm the most appropriate solution. For example at one of these sites we have problems with increasing organic material in the source water, leading to higher than expected trihalomethanes (THMs)

in drinking water. We will investigate further the characteristics of the organics to implement the lowest cost solution.

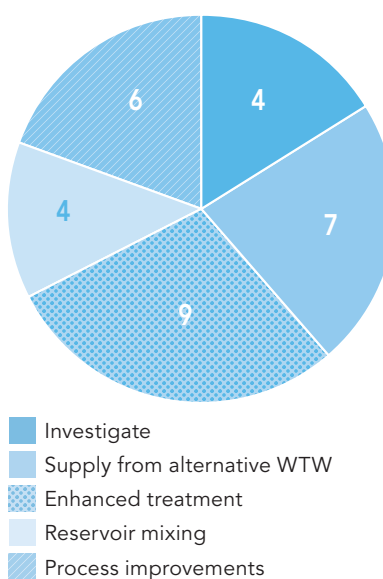
We have included in our programme an allowance of £42 million:

- For resolving the four non-compliant sites serving around 49,000 (1%) customers that are being investigated to confirm solutions; and
- To begin to address distribution mains that may be causing non-compliance for up to 853,000 (16%) customers and that are being investigated in the early years of our plan.

These allowances will be reviewed as part of the IR18 investment review in December 2017.

Figure 9 sets out the types of solution being adopted to address the 30 supplies that are currently non-compliant.

Figure 9 – Range of solutions used to improve drinking water supply compliance



We are aware that in the longer term there may be a move towards lead free water supplies and customers' plumbing to protect public health. At this stage we have included no allowance for investment and will remain watchful of developments.

Improvements to reliability supported by the Customer Forum and DWQR

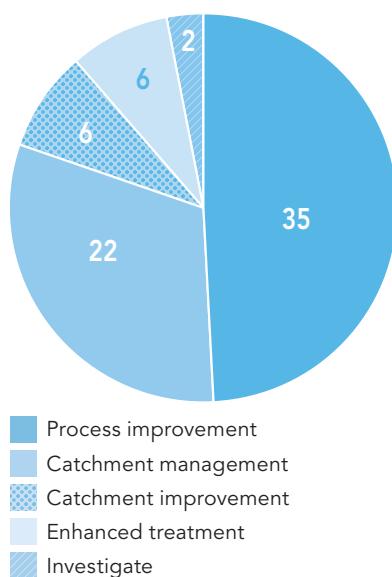
Following engagement with the Customer Forum and the DWQR, our plan includes actions to move towards a more proactive and preventative approach to improving the reliability of drinking water quality. We propose £98.9 million of improvements to increase the reliability of drinking water quality by:

- Managing catchments and improving treatment on 71 supplies serving over 1.7 million (31%) customers;
- Network or service reservoir enhancements to improve reliability of drinking water quality serving around 1.2 million (22%) customers; and
- Cleaning 5,927km of water mains serving 650,000 (12%) customers.

We have also included an IR18 allowance of £21.3 million for further actions to reduce risks of future non-compliance in supplies serving around 1 million customers that we are still investigating.

Figure 10 shows the range of solutions we are using to improve the reliability of drinking water quality on the 71 supplies.

Figure 10 – Range of solutions used to reduce risks of supply non-compliance



Innovation in action:

We are developing analytical capabilities to analyse the pre-cursors of THMs to allow targeted treatment optimisation. We are trialling this at 4 of our water treatment sites to determine if we can reduce THM formation adequately to achieve compliance. If successful this knowledge will be rolled out across our other chemical treatment sites to manage future risk to the quality of drinking water. We are also working to develop a THM modelling capability that may help us to reduce THM non-compliance in distribution.

Discoloured water

We expect that our planned improvements to drinking water quality through reducing iron and manganese levels will lead to fewer instances of discoloured water at customers' taps.

Innovation in action:

We are undertaking research looking at the causes of iron and manganese non-compliance in distribution to better understand how operational activities may contribute to the disturbance of material deposited in the mains and how we can introduce automated cleaning to prevent discolouration at customers' taps.

Taste and odour

We have not included any specific investment to address complaints regarding taste and odour of drinking water. We expect these to reduce through ongoing improvements to operational management and quality control.

Private water supplies

We are supporting DWQR and the Scottish Government to look at ways to improve the quality of private drinking water supplies through our research into sustainable rural communities. We have included no investment in the 2015 to 2021 period to connect any private supplies to the public network, as the priority supplies and most appropriate means of improving these have still to be determined. We expect these to be discussed as part of the IR18 investment review process.

Improving drinking water availability

Most of our customers have never experienced an interruption to their water supply, and they expect us to take reasonable steps to ensure that this continues. Fortunately we have only experienced a few events that have resulted in a prolonged service failure to our customers:

- In 1991 the single pre-stressed concrete trunk main from Bradan WTW in Ayrshire burst affecting supplies to over 100,000 customers for up to 3 days. A similar trunk main at Crawhill near Grangemouth has failed twice in the past year but with minimal effect on customers' supplies due to alternative supplies being readily available;
- In March 1997 diesel contamination by a roads contractor of the raw water supply to Alnwickhill treatment works resulted in supplies to around 150,000 customers in Edinburgh being interrupted for two days;

- In December 1997 a diesel spill at Burncrooks water treatment works resulted in 60,000 customers being without supply for nearly a week;
- A water treatment works at Kirbister, Orkney was flooded on 26 October 2006 which affected supplies to up to 6,800 customers for up to 5 days;
- The 'Big Freeze' of November 2010 to January 2011 saw some customers without water for over a week due to frozen pipes and Scottish Water servicing over 2,000 requests for bottled water.

There have also been circumstances where we have come close to significant loss of supply, including:

- Low rainfall from the summer of 2003 into spring 2004 affected supplies in Tayside with over 250,000 customers put at risk. Extensive customer campaigns were carried out, asking them to use water wisely, as well as temporary supply augmentations being implemented;
- Low rainfall in the spring and summer of 2010 affected several sources in Dumfries and Galloway putting around 55,000 customers at risk. Extensive customer campaigns were carried out; asking them to use water wisely while we increased leakage reduction activities, put in place temporary supply augmentations and requested our first Drought Order in five years;
- Low rainfall in the spring and summer of 2012 in the north west Highlands and Western Isles put the supplies to around 35,000 customers at risk. Several alternative supplies had to be sourced and tankered, as well as working with customers, asking them to help us reduce demand to extend available supplies while we increased leakage reduction activities;
- Low rainfall in summer of 2013 affected supplies in Fife to over 350,000 customers. Customer campaigns were carried out to ask customers to use water wisely while we increased leakage reduction activities and used alternative supplies to augment normal sources.

These historic events demonstrate that we are vulnerable to unexpected events or failures at critical assets, or extreme events, that could leave us unable to continue normal supplies. Therefore we have identified that we need to improve the

resilience⁴ of water supplies to reduce the risk of future interruptions and meet customers' expectations for uninterrupted service.

Our initial assessment indicates that around only 15% of our customers can be provided with a normal service from an alternative source of supply in the event of the loss of a critical asset (treatment works, raw water supply or certain strategic trunk mains).

The development of greater resilience involves the following:

- Ensuring critical assets are secure;
- Improving the supply system to ensure it has the necessary levels of duplication, reliability and resistance to withstand extreme events and maintain customer supply;
- Improving our ability to respond to customers' needs and recover the service in the presence of extreme events;
- Improving the drought resilience of our reservoir storage;
- Managing demand through leakage management and providing water efficiency advice to customers; and
- Reducing the risk of failure in critical assets.

Security of assets

This plan proposes investment of £9.5 million to meet the Scottish Government's defined security requirements, and reservoir flood resilience improvements required by the Flood Risk Management Act. A £2.6 million IR18 allowance has been included to address emergency shutdown requirements and reservoir flood resilience improvements once these have been investigated.

Critical asset risk

We propose to invest £18.6 million to move to a more proactive and preventative approach that reduces the risk of dam failures by accelerating actions to address emerging issues raised by the independent inspecting engineers before they became matters in the interest of safety.

We will continue to undertake inspections of our critical raw water and trunk mains to identify risks that may exist and seek to mitigate these through resilience solutions where appropriate.

⁴ Resilience is the ability of our supply systems to maintain essential services under extreme circumstances such as those caused by extreme weather, climate change (low rainfall or flooding), unforeseen asset failure [or terrorist attacks].

Resilience of supplies

This a priority area for service improvement for customers and the Customer Forum wishes to consider further the appropriate level of investment to be made and benefits this will deliver for customers.

This plan proposes £24 million to improve the resilience of supplies serving around 47,000 customers during periods of dry weather.

We propose to invest £54.8 million to improve resilience of supplies and support response to extreme events. This includes: £20.9 million to improve resilience of the Edinburgh water supply system to loss of supply from the Megget reservoir; £25.2 million in increasing the reliability of supplies by resolving risks identified through our Drinking Water Safety Plan process that could compromise the reliability of drinking water quality and the availability of supplies in 12 systems serving 815,000 customers and the Sullom Voe oil terminal; £3.1 million for a mobile water treatment works and £5.6 million to undertake detailed investigations of our critical assets/systems and their capability to deal with unforeseen events or catastrophic asset failure, and develop proposals for the strategy to improve resilience of other water supplies to extreme events across Scotland.

We are developing a risk assessment methodology that will facilitate a discussion with customers about the priority for addressing these risks and to inform the utilisation of the £12.1 million IR18 allowance set aside for beginning to improve the long term resilience of water supplies.

Leakage

We have updated our assessment of the economic level of leakage (ELL), which has confirmed that our current level is within the ELL range. If there is a desire to target the lower end of the ELL range of 500ml/day, this would incur a transitional cost of £10 million that is not included in this plan.

Our research identified leakage as an issue of concern to customers. Scottish Water is currently operating at the economic level of leakage (the level at which the cost of reducing leaks further is greater than the costs avoided of producing and distributing the water saved). When we explored this issue further with customers and the Customer Forum, it became clear that customers wish us to reduce the time

taken to respond and fix visible leakage (water running in the street) and the waste of a valuable resource.

On average we respond to visible leaks within 3 days of notification. In this plan we will improve our response times to same/next day and thus improve our customers' perception of our services. However we do not expect this to have a significant impact on our overall leakage levels or costs.

Water efficiency

We have included in our plan new operating costs of £1.4 million and capital costs of £0.8 million for increasing awareness and providing water saving packs and advice to household customers about the benefits to them of the efficient use of water in the home.

Short term interruptions to water supplies⁵

We plan to invest £4.6 million to further improve our speed of response to potential or actual short term interruptions to water supplies through further real-time network monitoring to identify issues early and take action to restore or maintain supplies. We are also looking for further opportunities to control pressures within our network to reduce the likelihood of bursts.

Water mains pressure

By 2015 we expect there to be only around 100 properties receiving pressure below the required minimum standard and a further 5,000 properties that may not receive the minimum standard without some booster pumping due to their location in relation to the storage tank that supplies them.

We receive many customer contacts about the pressure that customers are experiencing. Some of these relate to internal plumbing issues and others to managed changes in network pressures to reduce leakage where the minimum standard may not meet customers' expectations.

We have agreed with the Customer Forum to invest £0.5 million to undertake a detailed assessment of the range of pressure experienced by customers and explore further customer service expectations to inform our future plans. At the request of the Customer Forum, we have assessed the potential investment that may be required and included a £1.5 million IR18 allowance for priority improvement works that may arise from this improved understanding.

⁵ A short term interruption to supply is one that can last up to 48 hours. In general these are caused by asset failures, mainly water mains bursts and on occasion failures at pumping stations or water treatment works. The majority of customers have supply restored within 6 hours and it is rare for an interruption to last more than 24 hours.

Protecting and enhancing the environment

Our strategy at a glance

Scottish Water's environmental performance has been transformed over the last decade. But there is further work we must do to protect and enhance the environment, meet legislative requirements and achieve further reductions in flooding and pollution from sewers. Our customers have told us to target investment in areas where we can achieve the biggest environmental benefit.

Our strategy to prevent flooding from sewers:

If climate change results in even more wet weather, building bigger sewers would help deal with increased rainfall. However we will explore more sustainable and lower cost ways of managing rainwater from roofs, roads and car parks, where feasible.

We will work with customers and promote the best ways of disposing of household and business waste such as nappies, wipes and used fats and oils to reduce the extent of flooding from sewers.

Our strategy to protect and enhance the environment:

We will operate and maintain our waste water treatment works to reduce the likelihood of pollution and protect the natural environment. We will play our part in tackling climate change by acting to reduce our carbon emissions.

We will encourage farmers and landowners to play their part in preventing pollution in the water environment.

We will reduce leaks from our pipes and encourage recycling of water to reduce demand on supplies stored in lochs and reservoirs.

We will look for ways to operate our treatment works and networks in greater harmony with the environment. We will seek to influence others to remove chemicals and substances that find their way into waste water to avoid expensive treatment.



Over 80% of flooding from sewers is caused by inappropriate items being disposed of in toilets and drains. Encouraging customers to properly dispose of waste items will help prevent flooding of other customers' properties and improve the environment.

Our plan to protect and enhance the environment in the 2015 to 2021 period

We propose to make further improvements to our treatment works and sewer networks to enhance the collection and treatment of our customers' waste water so it can be safely returned to the environment. These improvements have been agreed with SEPA where appropriate and discussed with and supported by the Customer Forum.

Table 3 summarises the investment we propose to make to protect and enhance the environment.

Protecting and enhancing the environment

We have made significant improvements to our discharges over the past 20 years to support a better water environment.

The main drivers for improvement in environmental water quality have been, and continue to be, European Directives that have subsequently been transposed into Scots law. The main European Directives are: the Urban Waste Water Treatment Directive (UWWTD); the Water Framework Directive; the revised Bathing Waters Directive; the Waste Framework, Industrial Emissions Directive; the Shellfish Directive and the Priority Substances Directive.

Table 3 – Summary of proposed investment to improve the environment

Service area	Improvement programme	2015 to 2021 Capex £m (2012/13 prices)		
		Committed	IR18	Total
Protecting and enhancing the environment	Improvement required by SEPA to support improvements to the environment	367.0	25.9	392.9
	<i>Urban Waste Water Treatment Directive (UWWTD)</i>	296.4	3.7	300.1
	<i>Water Framework Directive (WFD)</i>	4.0	12.8	16.8
	<i>Revised Bathing Waters Directive</i>	30.7	3.9	34.6
	<i>Industrial Emissions Directive</i>	8.1	3.7	11.8
	<i>Shellfish Directive</i>	0.0		0.0
	<i>Priority Substances Directive</i>	3.4		3.4
	<i>Flood Risk Management Act</i>	13.4		13.4
	<i>Habitats Directive</i>	0.4		0.4
	<i>Compliance Assessment Scheme</i>	1.0	1.8	2.8
	<i>Preparation for future investment periods</i>	9.6		9.6
	Improvements required by Scottish Government to protect the water environment	5.5		5.5
	Improvement required by SEPA and local authorities to reduce odour nuisance	2.4	0.4	2.8
	Sub total	374.9	26.3	401.2
Reducing flooding and pollution from sewers	Improvements supported by the Customer Forum	108.1	58.2	166.3
	<i>Internal flooding improvements</i>	81.8	33.1	114.9
	<i>External flooding improvements</i>	18.7	25.1	43.8
	<i>Flood resilience assessments</i>	5.9		5.9
	<i>Surface water management investigations</i>	1.7		1.7
	Sub total	108.1	58.2	166.3
Total		483.0	84.5	567.5

The basis for our plan is to only take forward improvements where the following three key principles are met:

- There is robust scientific evidence that our discharges are having an impact on the water environment;
- There will be a clear benefit from the proposed investment; and
- Investing in our assets is the most sustainable way of achieving the required environmental outcome.

We have worked closely with SEPA to investigate the impact of our activities and the most cost effective ways of meeting the legislative requirements. Based on this work we have agreed areas that require further investigation or appraisal before committing to improvement. These areas include studies in relation to the Water Framework Directive, the revised Bathing Waters Directive, the Shellfish Directive and the Priority Substances Directive. These investigations are included as part of this plan with a view to informing investment from 2018 to 2027.

Our plan is based on the principles set out above and the outcome from 99 studies undertaken in partnership with SEPA to understand the impacts of around 1,400 assets, potentially impacting on 800km of receiving water and 42 protected areas. The studies demonstrated that around 600 of our assets are adversely impacting receiving waters. The remaining assets were confirmed as not having a significant impact and no investment is proposed to these discharges at this time.

For each issue that has passed our three key principles we have studied all the available options, including innovative and non-investment options, such as surface water management and oxygenation of the water body, to identify the lowest whole life cost solution. Our plan has been independently audited by Black and Veatch.

The majority of the investment in this plan to improve environmental water quality is to continue to improve our sewer networks to meet the requirements of the Urban Waste Water Treatment Directive, predominantly in the Greater Glasgow area. This will meet our commitments identified through the Metropolitan Glasgow Strategic Drainage Partnership.

Innovation in action:

"In summary, the key to the definition of an appropriate programme of projects for 'Improving the Water Environment' is to have an effective working relationship with the other stakeholders, in particular the environmental regulator, SEPA. Our overall conclusion is that Scottish Water has achieved such a relationship with SEPA (and other parties, where required) and that this has allowed an appropriate mix of projects and investigations to be defined which will effectively meet Scottish Water's obligations without expending resources on sub-optimal schemes before the needs are fully understood. There is much from this approach which could be learnt by other water companies."

Black and Veatch

Our proposed plan is as follows:

- **Urban Waste Water Treatment Directive:** Improve all known discharges that are confirmed as being non-compliant with the Directive. This includes £9.7 million to improve discharges from 20 small waste water treatment works serving 944 customers, £174.4 million to complete work started in 2010 to 2015 to reduce the impacts of 61 storm overflow discharges to the River Clyde and its tributaries, £46.5 million to improve a further 82 discharges to the River Clyde and Water of Leith catchments and undertake drainage, aesthetic and river/marine studies as required in order to confirm whether 372 intermittent discharges that may be unsatisfactory require improvement and develop strategic solutions for 62 confirmed as unsatisfactory. We have included an allowance in the committed programme of £65.8 million to reduce the impact of discharges from two large waste water treatment works in Glasgow serving over 500,000 customers. We are proposing that this allowance is ring-fenced, using the seven stage approval process, in our plan as there remain significant uncertainties regarding the construction cost of this project given that it involves significant tunnelling across parts of Glasgow. We have included an IR18 allowance of £3.7 million to commence delivery of improvements to storm overflows confirmed in the 2015 to 2018 period.
- **Water Framework Directive:** Our plans for improvements to meet UWWTD requirements also support meeting the requirements of the WFD. We have included further studies of the River Almond and Water of Leith to understand strategic solutions for these catchments and allow full consideration of

costs. We have confirmed, through studies, 9 water resource zones that require improved abstraction regimes to ensure there is sufficient water remaining in water bodies during periods of low rainfall and 11 dams or weirs to provide opportunity for migratory fish to pass our weirs and reservoirs. With the exception of four water resource zones where investment of £3.5 million is planned to protect drinking water quality and investment of £0.5 million for two fish passes, we have included all other confirmed improvements within the IR18 allowance of £12.8 million to allow consideration of phasing of delivery within the available finance to achieve overall compliance by 2027.

Where private discharges are impacting the water environment, we will support SEPA and the Scottish Government in evaluating the most appropriate means to address the environmental risk.

Innovation in action:

We will undertake surface water action plans with SEPA and traders in 15 industrial estates to reduce the impact of surface water discharges on the environment. If successful, these will avoid the need for additional treatment on these discharges.

- **Revised Bathing Waters Directive:** Our plan is to support SEPA in understanding when reductions in diffuse pollution are sufficient to allow Scottish Water to deliver an improvement that will measurably improve the standard of the bathing water. We will complete the strategic studies, commenced in 2010 to 2015, of assets on two rivers impacting three Ayrshire bathing waters and the newly designated 'Fisherrow' (Musselburgh) bathing water. We have included an IR18 allowance of £3.9 million to commence delivery of any solutions arising from these studies. We will also update our existing water quality models at 11 locations across Scotland at a cost of £0.3 million as new performance data becomes available. We will invest £1.7 million operating costs undertaking beach surveys to confirm whether our discharges are causing sewage related debris at designated bathing waters and clean up as appropriate. Our plan also includes investment of £30.3 million to complete works commenced in the 2010 to 2015 period.
- **Waste Framework, Industrial Emissions Directive:** We have undertaken studies at 30 sites where we store sludge produced at water or waste water treatment works. We propose no

further activity at 10 locations because no risks to the environment have been found, or risks have been transferred. We will carry out further monitoring at 10 sites to confirm whether the environment can be impacted by stored sludge and to clarify the impact associated with remedial activity and have made an IR18 allowance of £3.7 million in our plan for any necessary land restoration. We propose to invest £8.1 million to remove environmental risks at the remaining 10 sites either by stabilisation⁶ of sludge on site or removal at 4 sites and removal at the other 6 sites.

- **Shellfish Directive:** There are 80 designated coastal shellfish waters in Scotland. Scottish Water has previously been required to improve waste water treatment works and intermittent discharges close to shellfish waters, with the intention that this would protect water quality and improve shellfish flesh quality. Monitoring has shown that although minimum water quality standards are met where we have improved our assets, there has been little measurable improvement in shellfish quality. We are proposing no further investment in this area until all other impacts are understood.
- **Priority Substances Directive:** This was introduced in 2008 by the European Commission and is aimed at progressively reducing the impact of substances which are toxic to aquatic life. There is limited information about the prevalence of these substances in the environment and their source is not always understood so our plan is to invest £3.4 million on further research and development to allow substance specific strategies to be developed with SEPA. Until these strategies are in place, we are not proposing to make any improvements at our treatment works to remove these substances.
- **Flood Risk Management Act:** We will fulfill our duties under the Act to assess the risk of customers being affected by sewer flooding due to overloading and work with the local authorities and SEPA to develop plans to reduce flood risk. We have included £13.4 million in our plan for these studies and expect any matters arising from current studies to be considered as part of the 2018 investment review. We have made no IR18 allowance for this as we are unable at this stage to quantify the activities that may arise.
- **The Habitats Directive (together with the Birds Directive):** Scottish Natural Heritage has identified three sites where changes to

⁶ Stabilisation is an innovative approach that if successful avoids the costs of removing all the sludge from site.

Scottish Water's activities could help improve designated sites. At one site we plan to invest £0.4 million improving a discharge to protect dolphins, at two other sites we will undertake studies to confirm if we can make changes without impacting services to customers.

- Compliance Assessment Scheme:** SEPA introduced the compliance assessment scheme in 2011 to assess compliance with all aspects of discharge licences, not just the quality of the effluent discharged. Implementation of the scheme has identified that investment is required to provide new and improved flow and event monitoring equipment to record overflow discharge rates. The improvements will reduce the risk of non-compliance with the discharge standards. We will invest £1 million to improve monitoring at sites with confirmed requirements and have made an IR18 allowance of £1.8 million for commencing anticipated improvements to be agreed with SEPA.

Continuing with the approach adopted in the current period we plan to invest £9.6 million to undertake studies that will confirm future investment requirements to meet our statutory obligations. These studies have been agreed with SEPA and will ensure that we can meet our future obligations in the most cost-effective way with due consideration of the impact of all parties on the water environment.

The water bodies and discharges to be studied and improved under our proposed plan are shown in Figure 11.

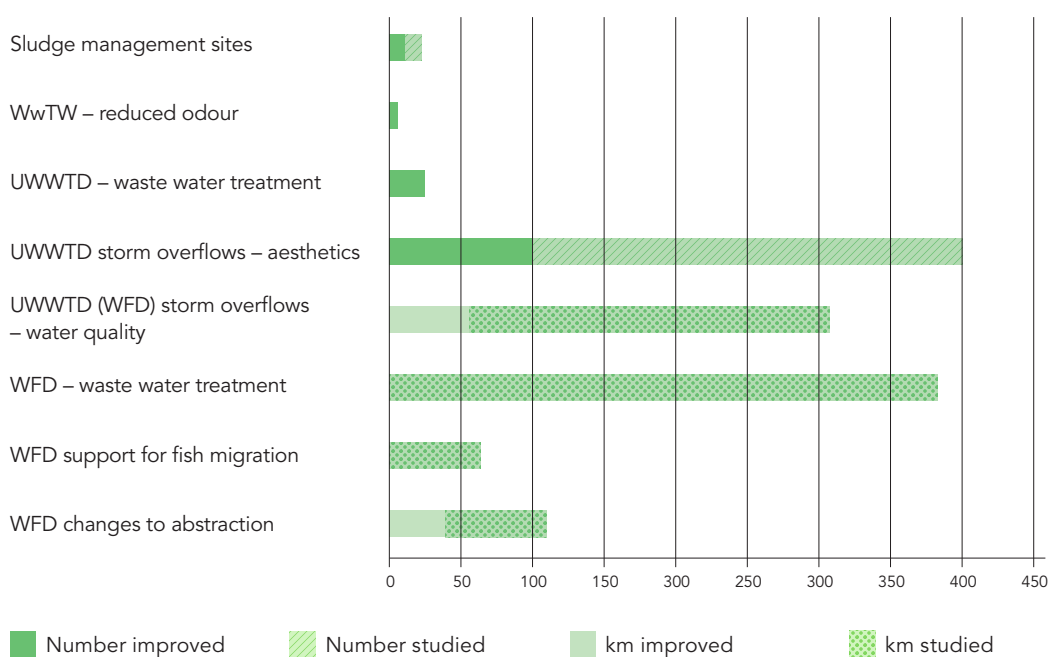
Odour code of practice and Waste Management Licences

Waste water treatment works can generate malodour due to the nature of the material being treated. There are statutory requirements to control odour. These are set out under the 'Code of Practice on Sewerage Nuisance', which is enforced by Local Authorities, and where sites are subject to 'Waste Management Licences' the control of odour emissions are enforced by SEPA. Using malodour complaint information received from customers, local authority environmental health teams and SEPA, we have identified 13 sites that generate, on average, 4 or more complaints per year. We plan to invest £2.4 million in delivering odour improvement plans at 2 sites subject to waste management licences and 3 other sites identified as causing a nuisance under the Code of Practice. We plan to defer investment in the remaining 8 sites until after 2021 as agreed with the Customer Forum. However, this will be reconsidered during the IR18 investment review should further priorities arise, and we have included a £0.4 million allowance for this.

Security of waste water assets

This plan proposes investment of £5.5 million to meet the Scottish Government's defined security requirements.

Figure 11 – Benefits of environmental water quality improvement plan



Reducing flooding and pollution from
our sewers

Flooding from sewers occurs when sewage escapes from the sewer network, either by coming back out of baths, toilets and sinks, or up through manholes and flowing overland into customers' properties and streets. We record all incidents of sewer flooding reported to us and investigate all incidents of internal flooding to ascertain whether they are due to the inability of our sewers to cope with storm events or due to blockages. Figure 13 shows the level of incidents reported to Scottish Water annually.

Where these flooding incidents are due to blockages our sewer response teams attend and address the cause of the blockage, undertaking surveys of the sewer where appropriate to ensure there is no defect requiring attention. Our experience shows that the majority of incidents are caused by inappropriate items being disposed of in our sewers.

Figure 12 – Causes of flooding from sewers

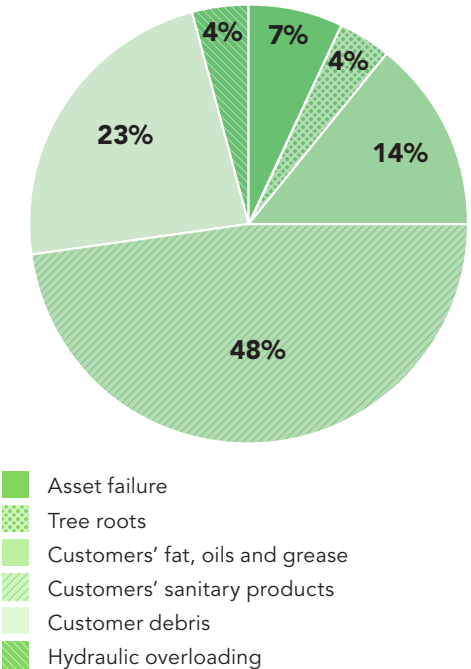
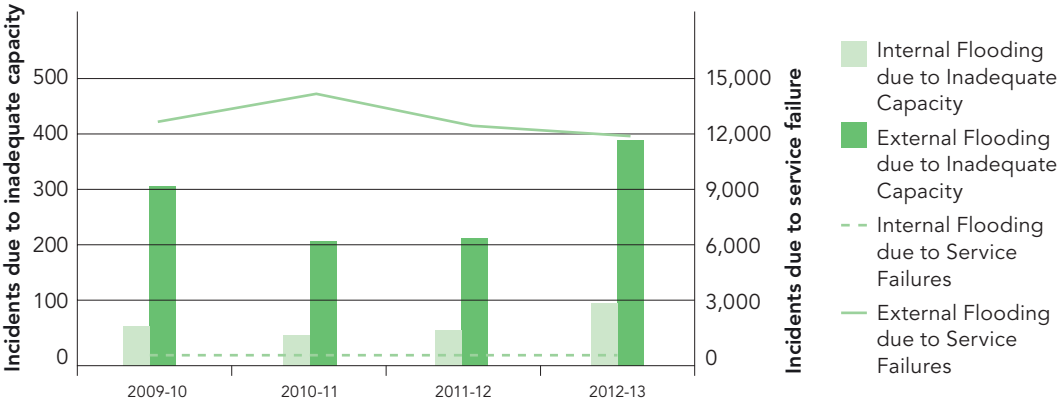


Figure 13 – Flooding events caused by sewers



Through our extensive customer research and our engagement with the Customer Forum we have identified sewer flooding (internal and external) as a high priority area for service improvement. By listening to our customers we realise that our current approach, while consistent with that adopted across the UK water industry, could be improved. Instead of focusing only on those customers that have actually been flooded we plan to make progress towards understanding those customers that are at risk of flooding.

We believe that intervening only once service has fallen to a 10% or greater chance of being flooded annually is not appropriate and we should progress towards sustaining services at no more than the 3% chance of flooding annually that our sewers were designed to achieve for all customers.

To improve our services by 2021 our plan includes:

- £13 million of new operational costs incurred on a long term customer education campaign and targeted consultation approach to reduce the volume of inappropriate material disposed of via the sewer, with targeted advice in areas of repeat occurrences. The outcome of this approach is uncertain since it depends upon us being able to successfully influence customer behaviour. If the campaign is successful, further extensions could be considered under the rolling enhancement programme.
- Providing support and care to customers during the investigation of their problems until these are fully resolved, including installation of temporary measures to alleviate the problem such as floodguards, given that many of these problems may take several years until they are fully resolved.

Innovation in action:

We are putting sensors in our sewers to allow us to proactively respond to the sewers filling up. The sensors give early warning allowing our operational response teams to go out and remove any blockages or put in place temporary measures that will reduce or avoid flooding impacts on our customers or pollution to the water environment.

- Investment of £114.9 million to improve our sewer network so that we can remove all customers from the internal sewer flooding register as quickly as possible, typically within four years of their problem being confirmed. This will reduce the register of customers with a 10% chance or greater of internal flooding from a forecast level of 340 to 370 properties in 2015 to around 250 to 280 properties in 2021, addressing an expected 72 emerging new properties each year as a consequence of 'urban creep' and changing rainfall patterns. This investment will also restore the resilience to flooding of neighbouring customers to 3% in the local catchment area. We have allocated £33.1 million of this investment as an IR18 allowance for review in December 2017 when more information will be available concerning the actual rate of emerging properties.
- Investment of £18.7 million to develop solutions for around 400 external sewer flooding areas and resolve around 120 known high priority external flooding issues where customers are experiencing repeat events. We have included a £25.1 million IR18 allowance to begin delivering solutions to the 400 external flooding areas investigated.
- Investment of £5.9 million to extend existing models and build new ones, beyond those required to support our Flood Risk Management Act obligations, to give a greater understanding of the customers' properties that have a resilience of less than 1:30 years. This will allow a prioritised programme of work to be developed and implemented after 2021 to proactively restore service resilience for as many of these customers as possible before they do experience flooding.
- Investment of £1.7 million to investigate the potential for surface water management approaches to reduce the hydraulic burden on our sewer systems.



Supporting Scotland's economy and communities

Our strategy at a glance

Since 2002 Scottish Water has transformed Scotland's water infrastructure, investing in the economy to support jobs and growth while reducing charges to customers. We plan to build on this while meeting new demand for our services and delivering a positive customer experience.

Our strategy to keep costs low:

We will find new technologies and ways of working to further improve the efficiency of our activities. We will continue to pursue opportunities to develop renewable energy from our land and assets.

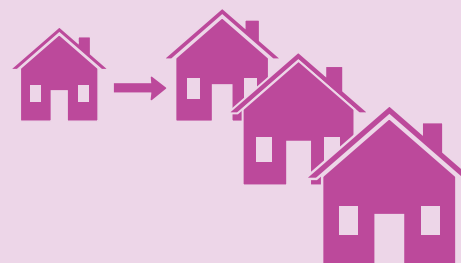
Our strategy to meet new demand quickly and effectively:

Encouraging customers to use water efficiently and reducing leaks from pipes can help maximise available water resources. We will encourage the development of new homes and businesses in areas that are well served by existing water supplies.

We will invest to ensure our treatment works and networks can meet the demands of new development.

Our strategy to support communities:

We will seek opportunities to share our knowledge to help communities prosper, while providing education resources that increase awareness of how valuable water and the environment are. To support employment we will continue to provide opportunities for training and apprenticeships.



Scottish Water is supporting the growing requirements for housing in Scotland by meeting the demand for new connections to the water and waste water networks.

Our strategy to deliver a positive customer experience:

We will continue to improve our communications with customers to keep them informed when problems occur and restore services as fast as possible. We will also seek to better understand our customers' priorities and provide the services they want.

We propose to make the improvements set out in this section to support the ongoing growth of Scotland's economy and our communities and further improve our leading customer experience. These improvements have been

agreed with the Scottish Government and supported by the Customer Forum. Table 4 summarises the investment we propose to make in this plan to support economic growth and communities.

Table 4 – Summary of proposed investment to support economic growth and communities

Investment area	Programme	2015 to 2021 Capex £m (2012/13 prices)		
		Committed	IR18	Total
Supporting economic development	Statutory requirement to connect 113,000 new customers	90.9	114.2	205.1
	<i>Reasonable Cost Contributions (Part 2&3)</i>	49.0	59.3	108.3
	<i>Treatment Strategic Capacity (Part 4)</i>	31.4	48.6	80.0
	<i>Adoption of developer constructed assets (Part 2&3)</i>	1.4	6.3	7.7
	<i>First time installation of non-domestic meters</i>	9.1		9.1
	Statutory requirement to relocate services for transport infrastructure projects	6.9	6.9	13.8
	Sub total	97.8	121.1	218.9
Customer experience	Improvements supported by the Customer Forum	20.8		20.8
	<i>Improved contact management and proactive communication</i>	6.7		6.7
	<i>Wholesale meter accuracy improvements</i>	14.1		14.1
Climate change	Vulnerability assessments and monitoring supported by the Customer Forum	2.9	1.4	4.3
Reduce long term cost of service	Improvements supported by the Customer Forum	48.0		48.0
	<i>Renewable power</i>	34.5		34.5
	<i>Energy efficiency</i>	6.7		6.7
	<i>Research & Innovation</i>	6.8		6.8
Total		169.5	122.5	292.0

Supporting economic development

Scottish Water has a statutory duty to provide water supplies and to drain domestic sewage, surface water and trade effluent where it can be provided at reasonable cost. Ministers' draft objectives are to service demand for new strategic capacity to meet all new housing development and the domestic requirements of commercial and industrial customers and to support developers in connecting to our system to the extent that it is reasonable to do so.

When assessing the demand from new customers, the location and timing of the demand, the impact of that demand on different parts of our networks and other changes such as falling average household size must all be considered. We have considered the National Records of Scotland's (NRS)⁷ population projections, and our current trends of new

connections as shown in Figure 14. As can be seen from the graph our forecast growth requirements are significantly below the NRS principal projections.

Reasonable cost contributions

Between 2015 and 2021 we anticipate connecting around 113,000 (4.5%) new household and business properties to the water and drainage systems. We estimate we will have to make reasonable cost contributions of £108.3 million across the six years of our plan and have allocated £59.3 million of this to IR18 to allow the investment review to take account of actual growth rates and costs.

Treatment strategic capacity

To meet new demand we estimate we will require additional waste water treatment capacity for around 40,000 customers at

⁷ From 1 April 2011, the General Register Office for Scotland (GROS) merged with the National Archives of Scotland to become the National Records of Scotland (NRS).

Figure 14 – Historic and forecast new connections by service



a potential cost of £80 million, primarily in small rural catchments. Our analysis at present has identified that we have adequate water treatment capacity to meet new demand as a consequence of our activities to reduce leakage in the 2010 to 2015 period. Given the uncertainty surrounding the specific demand and locations of new development the whole growth allowance is ring-fenced and we have allocated £48.6 million of this investment as an IR18 allowance to allow the investment review to take account of actual demand and costs.

We will continue to work with planning authorities and developers to encourage sustainable development, such as encouraging new development in areas where there is surplus capacity in our existing assets. As new demand emerges we will continue our approach of assessing how best to provide for this, considering demand management options before committing to investment to build new treatment facilities. We will also, where appropriate, explore options with Licensed Providers for Section 29e opportunities for alternative supplies for wholesale customers where this is beneficial to both parties.

First time installation of non-domestic meters

A water meter must be provided when connecting new non-domestic developments/premises. Annual volumes of these are subject to the normal pressures of economic growth and development however we anticipate connecting around 3,000 new business premises over the 2015 to 2021 period. Additionally as business

premises merge, divide or change use (from household to non-household) there is a need to install new meters, often at the request of Licensed Providers; we forecast installing around 6,000 new meters to fulfil customer demand. Some business premises currently do not have meters installed; we forecast installing 9,000 additional new meters as these are identified with Licensed Providers. Overall, we forecast that between 2015 and 2021 we will undertake a total of 18,000 first time meter installations at an estimated cost of £9.1 million. The costs may vary depending on the type of pulse-enabled meter selected and the specific configurations of the property for installation.

Adoption of developer constructed assets

We have identified a number of assets built by private developers who have now gone out of business where the assets do not meet our minimum adoptable standard.

We propose to develop a process with key stakeholders to deal with these issues, ensuring that all other avenues for recovery of costs from developers are exhausted. We have made an initial assessment of the costs of bringing these assets up to standard to allow formal adoption, and then maintenance and operation. We propose investing £1.4 million in new asset maintenance and £3.8 million in operation of new assets successfully adopted from developers, and an IR18 allowance of £6.3 million to deal with the adoption and operation of the remaining assets, which are serving existing customers.

Consistent with current practice, we propose that the investment allocation for meeting new demand (including the adoption of legacy assets) should be ring fenced within the investment plan and the allocation reviewed in December 2017 as part of the investment review.

Service relocations

Scottish Water has a statutory duty to support the relocation of water and waste water services to allow transportation improvements to be delivered. The physical relocation works can be undertaken by either Scottish Water or the Transportation Authority with the costs split between both based on the condition of the infrastructure replaced. We forecast we will invest £6.9 million between 2015 and 2018 and the same between 2018 and 2021 (IR18 allowance).

Customer experience

Customers have highlighted that we should be providing the best possible service, as measured across all industries, and many were of the opinion that investment is essential to enhance their customer experience. We therefore wish to enhance the service experience that we provide, being accessible to our customers, and giving them a satisfactory and timely resolution to their queries. This is reinforced by uprating our Guaranteed Standards Scheme and Price Promise.

Price Promise

In 2010 we introduced a price promise to customers to clearly signal that they are at the heart of all aspects of our business. We intend to enhance this promise in the 2015 to 2021 period. Our price promise to customers comprises three elements:

1. Household and wholesale charges that will continue to decrease, in real terms by reference to Consumer Price Index, by 2021.
2. Where we cannot consistently provide the minimum level of service under normal operating conditions, customers will receive an appropriate rebate of their charges, as indicated in Table 5, up to a maximum of £1,000.
3. Compensation under a Guaranteed Standards of Service scheme will continue to be provided to customers inconvenienced for short or intermittent failures in service.

Our Code of Practice will continue to be improved and simplified such that it is easy to access and understand for all customers. A key development in the 2015 to 2021 period will be to merge our existing service standards and price promise, and taking a more proactive approach to offering rebate and compensation payments.

Table 5 – Price promise

Standard	Rebate
Properties on register of unacceptable pressure	100% of annual water charge while on the register.
Properties at risk of internal flooding from overloaded sewers	100% of annual waste water charge while on the register.
Properties flooded internally from overloaded sewers	Where a customer suffers from internal sewer flooding, the rebate paid for being on the register will be increased to a minimum of the band D level of household waste water charges.
Properties flooded externally from sewers	50% of the annual waste water charge on each occasion, up to a maximum of 100% of the annual waste water charge in any one year.
Unplanned interruptions to supply	25%-100% of annual water charge for between 2 and 5 incidents, up to a maximum of 100% of the annual water charge in any one year.
Water quality	100% of the annual water charge in the year if not resolved in 3 months.
Getting connected	£20-£100 per day's delay, up to a maximum of 100% of the connection charge.

Improving our communication with customers

During 2015 to 2021 we propose to further improve our communication channels with customers by enhancing our Customer Relationship Management system, at a cost of £6.7 million, and approach so that by 2021:

- Customers will have greater accessibility to Scottish Water to be able to communicate with us in the way that best suits them.
- We will provide easier to access information on our services, and enable customers to request and manage services through direct online access.
- The speed of our response to customer issues will be reflective of the issue and customers' circumstances. During resolution we will maintain contact and ensure the issue is resolved to the customer's satisfaction.
- Licensed Providers will find us easier to deal with as a wholesaler and provide their customers with the levels of service they expect.
- We will seek to improve our new connections services, making this quicker to respond and easier to deal with.
- When developing capital projects our community liaison team will ensure that we are listening to feedback from our customers and providing relevant information and updates to help customers prepare for any disruption.
- Our customer Code of Practice will be improved and simplified such that it is easy to understand and transparent to all customers.

Wholesale meter service improvements

We currently offer a choice of meters to Licensed Providers and their customers through a meter menu. The selection of meters by Scottish Water and the choices available on the meter menu will continue to be kept under review with Licensed Providers taking on board wider manufacturer and industry developments.

Licensed Providers can also choose to instruct suitably accredited companies to undertake certain metering, new connection and data logging activities, thus offering choice and flexibility. The framework supporting this is still in its early stages and we will continue to support its development.

To improve service, and support advanced metering infrastructure, it is recommended meters are replaced every 15 years rather than run to fail. Investigations show that this frequency would allow us to continue to assure Licensed Providers and business customers that consumption and bills are accurate. It is forecast that around 84,000 meters will require to be replaced between 2015 and 2021 requiring an increased investment of £14.1 million.

Climate change

We have the lowest carbon water service in the UK owing to the greater opportunity to use gravity to supply our customers (rather than pumping).

Conversely, the carbon intensity of our waste water service is among the highest. This is because Scotland's geography, topography and extensive low density, distributed population requires many small treatment works and pumping of waste water.

Over the past 5 years we have reduced our carbon footprint by 10%. We forecast that our carbon footprint will reduce by around a further 2% by 2021 as a result of this plan. This is due to the proposed improvements in energy efficiency and investments in renewable power generation (3%) off-setting the upward pressures from increased operational emissions arising from the planned service improvements (1%). We also forecast that if the electricity grid decarbonises, in accordance with UK Government targets, our carbon footprint could potentially be reduced by a further 27% by 2021.

We will invest £2.9 million to undertake further vulnerability assessments and monitoring to inform our understanding of the impacts of climate change on our services and have made an IR18 allowance of £1.4 million for further work that may arise from this.

Community Involvement

We agree with the Customer Forum that there is more that can be done to get close to customers and to help them co-produce outcomes for themselves, their community and the water and sewerage systems as a whole.

We will build on the work done to improve customer education on blockages to sewers caused by customer behaviours; to develop, with the Customer Forum, potential approaches to customer education, care and support; and to subsequently trial and evaluate such approaches.

Reducing longer term cost of service

'Invest to save' opportunities are those that take longer than the business plan period to pay back the initial investment and thus, by definition, require upfront investment to enable them to take place. We have identified four main invest to save opportunities, these being:

- Generation of renewable energy,
- Energy demand reductions,
- Further rationalisation of our water treatment works, and
- New approach to lead standards compliance.

In this plan we propose to invest £6.7 million to improve energy efficiency of our assets, reducing energy consumption by around 10 GWh, and £34.5 million to generate an additional 14 GWh of renewable energy from advanced anaerobic digestion, hydro and photovoltaic generation. Constructing and operating an advanced anaerobic digestion plant will also give us valuable experience for when we plan for the termination of the Daldowie PFI sludge treatment contract in 2026.

The benefits of this investment are an ongoing reduction in operating costs of £3.7 million a year by 2021 and a reduction of our carbon footprint of around 3%.

We have identified 7 water treatment works rationalisations that we will undertake as part of our drinking water quality programme. We do not plan to invest in any other identified rationalisation opportunities due to the extended payback periods as agreed with the Customer Forum.

We have deferred the option to remove lead pipes to enable switching-off of our ortho phosphoric dosing plants as the payback periods are long, and we wish to further explore options to protect drinking water quality within our customers' pipe work.

An area of future development for Scottish Water and the industry at large may be the potential to recover value from waste water streams. As natural resources, e.g. phosphorus and nitrogen (used as fertiliser), become depleted, the potential of recovery of these elements from waste water streams becomes more attractive. Waste water streams also have energy potential (heat recovery and energy generation) and this will be a focus of our research and innovation activity in this area. There is also the potential with national zero waste strategies to divert material that currently goes to landfill for beneficial use. This will be part of our research and innovation focus in the 2015 to 2021 period.

We have included in our plan £6.8 million of investment in research and innovation that could reduce costs of future services or improve services. These are over and above our normal water industry innovation collaborations and were discussed and supported by the Customer Forum and cover the following areas:

- New technologies that reduce the economic level of leakage;
- Value generation from waste;
- Automation and real time control;
- Sustainable rural communities; and
- Trialling new technologies with our supply chain.

Supporting business growth

We plan to work closely with Licensed Providers and business customers in matters specifically under the direct control of Scottish Water (wholesale) and that may facilitate business growth. We will engage with the Customer Forum in reviewing progress in this area.

Financing our services

Investing in future water services

Our strategy at a glance

Household water and waste water charges in Scotland are among the lowest in Great Britain. Customers have told us that their preference is to continue with stable charges (charges that increase no more than inflation) to allow investment to further improve services in the areas that customers have told us are a priority.

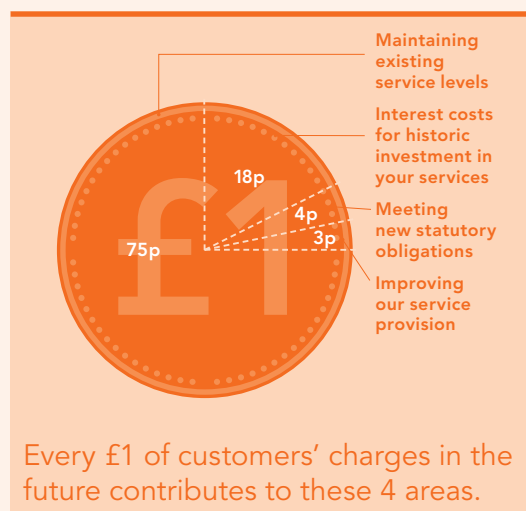
Most of Scottish Water's annual budget – and the charges customers pay – is currently spent on maintaining existing service levels for customers and for paying interest costs for historic investment in their services.

Our expectation of future costs:

We will continue to look for ways to be more efficient in how we deliver services and have taken these into account in our projections, but we expect that our maintenance costs will rise as existing treatment works – built in the last 15 to 20 years – are refurbished. However, we expect the number of customers will also rise, which could help to keep costs for everyone more stable while maintaining services.

In our projections we have assumed that investment to meet statutory obligations, based on known requirements, will reduce over the next 25 years. We expect that our future capital investment requirements will remain around £500 million per annum (in 2012/13 prices) as a result of increasing capital maintenance requirements and ongoing investment to improve services to meet customers' expectations in areas of water supply resilience and prevention of flooding from sewers.

Over the years Scottish Water has taken out loans to efficiently finance investment, to make improvements to services and meet statutory obligations. We will continue to incur interest costs on these loans over the coming years and on new loans taken out to finance our proposed statutory and service improvement plans.



Our strategy to improve services:

We plan to increase investment for service improvement to around 3% of what you pay to further improve services in the areas of:

- Reducing interruptions to water supplies
- Reducing flooding from sewers
- Investment to support reducing long-term costs
- Encouraging water efficiency
- Improving the customer experience of our services

Financing our services

The costs of providing water and waste water services are primarily met by household customer and wholesale charges, with borrowing from the Scottish Government supporting investment in service improvement and legislative compliance.

Since Scottish Water was formed, 12 years ago, charges have risen by less than inflation and significantly less than those in England and Wales. This has been possible due to the significant efficiencies we have delivered, reducing our operating costs and the costs of building new treatment works and infrastructure. In 2013/14 average household charges in Scotland at £334 a year are £54 below the average annual charges in England and Wales.

Uniquely among water companies in Great Britain, we committed in the 2010 to 2015 period that our charges would rise by less than inflation. We have listened to our customers' priorities and agree with the Customer Forum that we need to carefully balance the rate of ongoing service improvements with the affordability of future charges, given the current economic climate. We therefore remain committed to charges reducing in real terms for the 2015 to 2021 period.

Charges to apply from 2015

The Scottish Government sets the principles of charges for water and waste water services. In these, a key principle is that charges should be broadly cost reflective across different

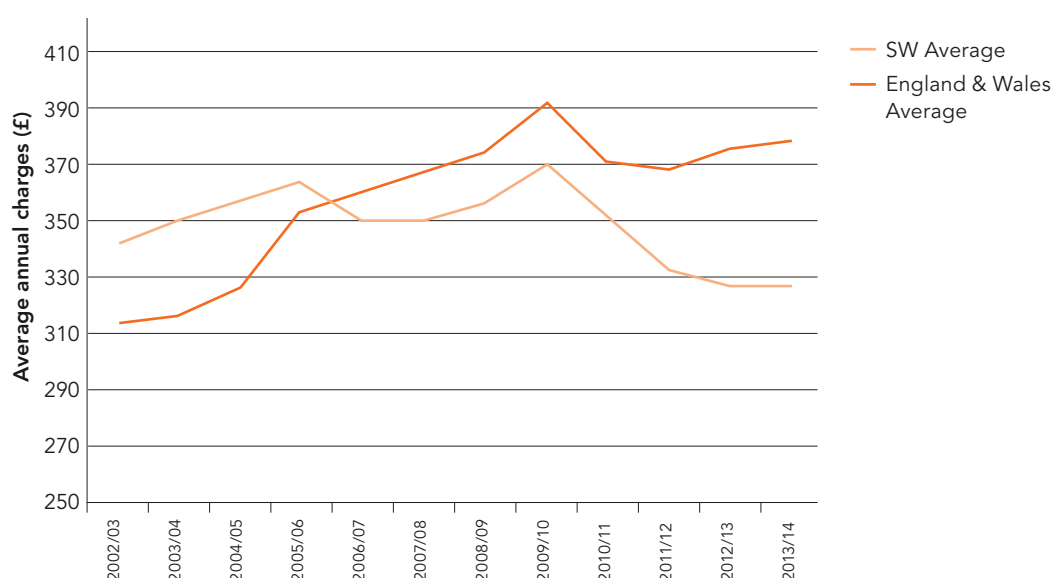
customer groups. The Water Industry Commission undertook work at the last price control in 2009 to establish cost reflective wholesale charges. Our plan recovers revenue in accordance with this principle.

Household charge cap

The Customer Forum highlighted that customers recognise the Consumer Prices Index (CPI) as their primary measure of inflation because of its publicly recognised status as the UK Government's measure of inflation, and its use as the index for changes to pensions and benefits. We therefore recommend that changes in prices in 2015 to 2021 should be considered in the context of CPI. We have agreed with the Customer Forum an overall household charge cap of 1.75% less than CPI over the 2015 to 2021 period. We will implement a fixed nominal price increase of 1.6% in each of 2015/16, 2016/17 and 2017/18. This follows a limiting of household price increases in 2014/15 to 1.6%.

Any under or over recovery during 2015 to 2018 may be adjusted for in 2018 to 2021 under the charge cap arrangements. However, if the application of the charge cap methodology would require household prices during 2018 to 2021 to exceed 1.6% per annum then, prior to the application of such an increase, Scottish Water, the Customer Forum and the Water Industry Commission for Scotland will consider whether any, or all, of the increase above 1.6% can be off-set by overall favourable external factors, rephasing of IR18 investment to after March 2021, or by returning any early sustainable outperformance to customers.

Figure 15 – Comparison of household prices 2002 to 2014 (2012/13 prices)



Wholesale revenue cap

Our wholesale revenue in the 2010 to 2015 period has been significantly below that expected as a result of the challenging economic conditions and the focus on improving water efficiency by customers and licensed providers. In the 2015 to 2021 period, we expect significant uncertainty in the wholesale customer revenue base because of changes to charging arrangements that will occur over the next 6 years and further efficiency in customers' water and waste water service consumption arising because of increased market competition.

We believe it is therefore appropriate to introduce a wholesale revenue cap for the 2015 to 2021 period. This would protect household customers from the risk of under-recovery of wholesale revenues and provide the incentive for full revenue collection by Licensed Providers as the average price per non-household customer would be further reduced if more revenue is collected than expected. The proposed wholesale revenue cap assumes that the underlying total wholesale revenue will increase annually by no more than 0.3% below CPI, excluding the impact of charging for vacant properties from 2017. The wholesale charges will be adjusted, as required, to recover this total revenue. If Licensed Providers secure more customers then the average charge for each business customer will reduce, and vice versa.

Affordability

While our research indicated that there may be an overall acceptance of price rises in line with general inflation, our discussions with the Customer Forum and Consumer Futures revealed a concern that there could be an increasing risk of charges becoming unaffordable for certain groups of customers. We will continue to work with the Scottish Government and other stakeholders, including the Customer Forum, to investigate if more can be done to support vulnerable customers within the principles of charges laid down by Scottish Ministers.

Financing

The key assumptions underpinning our financial projections are that:

- CPI inflation will be 1.9% p.a. throughout the 2015 to 2021 period and that RPI for costs will average 0.75% p.a. above CPI throughout the period;
- Our domestic customer base will grow by 0.74% p.a. on average while our non-household customer demand will remain stable;
- The introduction of charging for vacant properties from 2017 will increase wholesale revenues by £15 million a year;
- The charge caps are those we have set out above; and
- Our proposal for a wholesale revenue cap is accepted.

It is also important to note that our revenue projections assume that our household tariffs in 2014/15 rise by 1.6%, and that we will receive £110 million of net new borrowing in that year.

Revenue forecast

Table 6 sets out our forecast revenue based on the assumptions set out above.

Borrowing requirements

To finance the delivery of our capital enhancement programme we require £720 million of new borrowing over the 2015 to 2021 period. This requirement is consistent with the Scottish Government's indications of the likely available new borrowing, set out in the September 2013 draft budget.

After 2021, new borrowing may need to increase to around £170 million per annum in the 2021 to 2027 period to support the required ongoing investment to meet statutory obligations as set out in our strategic projections.

Table 6 – Revenue forecast

Revenue forecast (£m outturn)	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Total
Household revenue	811	830	849	870	890	912	5,162
Wholesale revenue	283	287	306	311	316	321	1,824
Other revenue	6	6	6	6	7	7	38
Total Revenue	1,100	1,123	1,161	1,187	1,213	1,240	7,024

Forecast costs of delivering services 2015 to 2021

Table 7 summarises the forecast costs of delivering this plan over the 2015 to 2021 period. Further details of the costs can be found in the appendices to this plan. Our financial projections are presented at outturn prices.

Our assessment, in outturn prices, of the overall cost of delivering our plan is £8,059 million during the 2015 to 2021 period. We will finance this with revenue from customer charges of £7,024 million, net new government borrowing of £720 million, utilising £220 million of opening cash balances and funding from infrastructure charges and asset disposals of £95 million.

Capital investment

Our investment plan is of a size that is affordable and deliverable efficiently as we have planned a delivery profile that includes both a start early programme and investment completion after March 2021. The forecast investment completion after March 2021 is excluded from the costs that require to be financed in the 2015 to 2021 period.

We expect to continue to improve the efficiency of our investment activities and have identified opportunities to improve on the costs used to prepare the plan by 13%. We have set ourselves a stretching challenge to deliver additional efficiencies beyond those we have identified such that we will improve efficiencies by 14.4% to 17.9% over the period from the historic costs used to prepare this plan (assuming that future capital costs are indexed by RPI). These efficiencies are over and above the strategic and innovation efficiencies identified in development of the solutions to deliver the required improvements, including the rationalisation of assets and the synergies between investment areas.

Our efficiency plans are a mix of revised procurement arrangements, streamlining our investment management processes and improved productivity within our supply chain. Therefore we are dependant on our suppliers working in partnership with us to deliver better value for our customers.

Table 7 – Financing and expenditure 2015 to 2021

Financing and Expenditure £m (outturn prices)	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	Total
Customer revenue	1,100	1,123	1,161	1,187	1,213	1,240	7,024
Net new borrowing	120	120	120	120	120	120	720
Infrastructure Charges Income	11	11	12	14	15	16	79
Disposals	6	6	1	1	1	1	16
Use of Cash Balances	46	51	51	19	24	29	220
Total Financing	1,283	1,311	1,345	1,341	1,373	1,406	8,059
Capital investment	564	579	595	575	592	607	3,512
Operating costs	383	395	404	413	421	432	2,448
PFI contracts	166	169	174	179	183	188	1,059
Interest	166	169	173	176	179	183	1,046
Change in working capital	4	-1	-1	-2	-2	-4	-6
Total Expenditure	1,283	1,311	1,345	1,341	1,373	1,406	8,059

Our forecast statutory investment costs include the costs of completing the Ministers' Q&SIIIb objectives which will continue beyond March 2015 due to the necessary time to confirm and deliver solutions to improve intermittent discharges to the River Clyde in Glasgow, and the additional outputs to accelerate priorities for drinking water quality improvements and sewer flooding. Our current forecast of the completion costs is £260 million (outturn prices equivalent to £236 million in 2012/13 prices). However as these projects, being progressed under the 'seven stage process', are not yet fully developed there is a risk that these completion costs could change. We propose to update the forecast costs of this work along with the proposed ring-fenced £65.8 million scheme for upgrading the discharges at Dalmarnock and Daldowie waste water treatment works in Glasgow as we progress through the price control process.

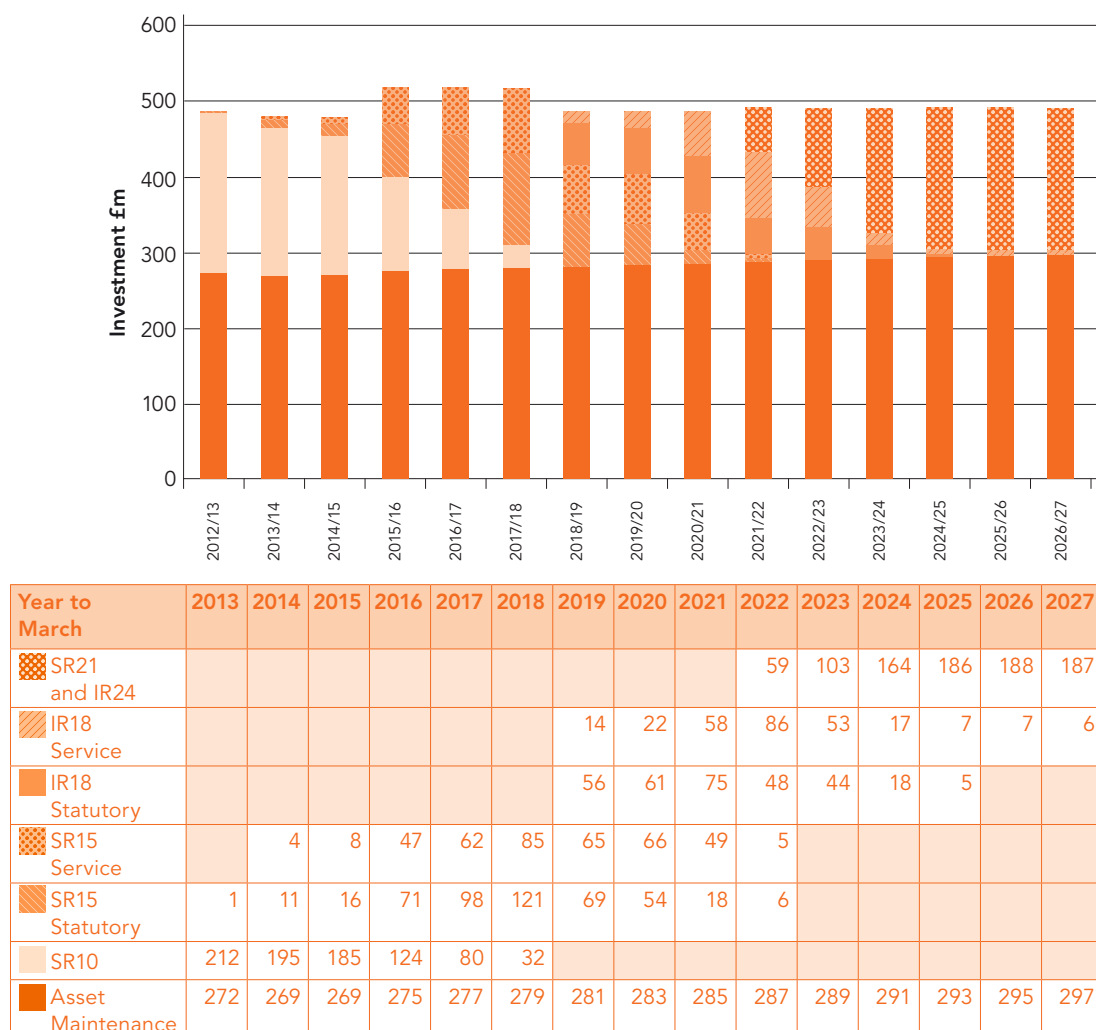
Figure 16 shows the key components of our investment plan including the £40 million early start investment financed in 2010 to 2015 and the proposed £286 million IR18 allowance for solutions to known improvement priorities that are being investigated and emerging priorities that will be reviewed and confirmed in December 2017.

Operating costs

Our forecast operating costs, shown in Table 8, are consistent with the efficient range that the Commission has reported in its information notes to the Customer Forum.

We have made significant efficiency improvements over the last 12 years and therefore the opportunities for ongoing improvement are smaller than they have been in the past. The primary focus of our efficiency

Figure 16 – Forecast investment profile (2012/13 prices)



plans is further productivity improvements, greater energy efficiency, increased renewable energy generation and reducing the costs associated with service failures by preventing these from happening.

In addition to this we will continue to seek ever more innovative ways to deliver services such that we can reduce the costs of service provision:

- Using sustainable land management techniques to improve the quality of raw water such that we can use fewer chemicals in drinking water treatment processes, and prolong the life of filters;
- Seeking to operate our waste water treatment works to a standard that is appropriate to the actual conditions; and
- Using pressure management techniques to control the level of interruptions to supply and reduce leakage further.

Overall we believe that our ongoing efficiency and productivity improvement programme will off-set the underlying operating cost pressures associated with delivering higher service levels, meeting new statutory compliance objectives and the increase in employers national insurance contributions.

It is important to note that there are several costs we incur that are not fully in our control. While indexing of costs by RPI will protect us from most cost changes, there are risks

of one-off changes to our costs that we may not be able to manage within this plan. The appendices to this plan provide more details of these, but the main risks are a revaluation of business rates in 2017, changes to employer pension contributions, introduction of a road works levy, changes to the cost of collecting household charges by local authorities and changes in the level of non-payment by household customers.

PFI costs

Around 50% of our waste water and about 80% of our waste water sludge is treated in works operated by PFI companies. The costs of these contracts are generally fixed and linked to RPI through the terms of the contract. The cost of these contracts includes for the full repayment of the financing incurred by the PFI companies to build these works. Over the years we have investigated whether it would be efficient for Scottish Water to buy out these contracts. To date we have not identified any contracts where this would be the case. We do not see opportunities in the 2015 to 2021 period to reduce the costs in this area and are looking at the opportunities that may arise post 2021 when the first of these nine contracts reaches expiry.

Interest payable

Closing debt as of 31 March 2015 is forecast to be £3,464 million. The anticipated weighted average interest rate on the closing debt at 31 March 2015 will be around 4.9%.

Table 8 – Annual operating costs

£m, (2012/13 prices)	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
2012/13 Base Operating Costs	350	350	350	350	350	350
Severance Cost Reduction	-3	-3	-3	-3	-3	-3
Base Efficiency Plan	-8	-9	-10	-11	-12	-14
Forecast Base Operating Costs	339	338	337	336	335	333
Energy Cost Increase (2013-2015)	3	3	3	3	3	3
Cost of Collection Increase (2014/15)	2	2	2	2	2	2
National Insurance Contributions Increase	0	2	2	2	2	2
Adjusted Base Operating Costs	344	345	344	343	342	340
SR10 new operating costs 2013-15	7	7	7	7	7	7
SR15 new operating costs	3	4	5	5	5	7
SR15 Invest to Save Benefits		-1	-2	-3	-4	-4
Forecast Total Operating Costs	354	355	354	352	350	350

For new borrowing in 2015 to 2021, we have assumed an average interest rate of 4.0%. While we will continue to manage our debt portfolio efficiently and in a way that protects customers from significant risks, we are exposed to the consequences of increasing interest rates.

Financial overview

Table 9 sets out our forecasts for key financial metrics.

Financial Strength

In setting the balance of financing from customers and new borrowing we have targeted broadly maintaining the overall financial strength of Scottish Water at the forecast levels that will be achieved in 2014/15. This strength is at the lower end of the tramlines set out by the Commission in its information note to the Customer Forum.

Risk

Our plans are, necessarily, underpinned by forecasts many of which are outside of our control. Table 11 highlights the key risks currently identified and the associated potential financial impact during the 2015 to 2021 period. As it is not possible to reliably assess the specific financial impact of these risks, we have set out the potential ranges of costs or a possible

sensitivity for each risk. We acknowledge that the economic growth, general inflation and interest rate assumption risks could also result in favourable circumstances.

Our analysis suggests that while higher growth benefits customers in the longer term, it is likely to generate more costs than additional revenue within the 6 year period.

Where risks materialise, we would seek to use established regulatory mechanisms to manage the impact. It is noteworthy that in the current period exogenous risks such as business rates and carbon tax increases have materialised at a total cost of £147 million. It has only been possible to absorb these additional costs due to favourable financial conditions in the 2010 to 2015 period. If risks of a similar magnitude materialise in the 2015 to 2021 period it is likely that we will need to reprioritise this plan and/or seek a redetermination of charges.

We have discussed with the Customer Forum the possibility that significant price increases may be required after 2018 should inflation or other costs outwith our control be materially greater than we have assumed in our plan, given the low fixed prices we have agreed for 2015 to 2018.

Table 9 – Financial projections (outturn prices)

Financial projections Outturn prices – £m	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
Total revenue	1,100	1,123	1,161	1,187	1,213	1,240
Profit before interest and tax	225	227	240	247	254	263
Net interest payable (including PFI element)	188	191	193	196	197	201
Profit before tax	37	36	47	51	57	62
Tax	8	8	10	11	12	13
Retained profit	29	28	37	40	45	49
Capital investment	564	579	595	575	592	607
Net new borrowing	120	120	120	120	120	120
Closing Regulatory Capital Value	7,227	7,557	7,899	8,223	8,568	8,931
Closing debt	3,584	3,704	3,824	3,944	4,064	4,184

Table 10 – Financial ratios

Financial ratio	Forecast 2014/15	Forecast 2020/21	WICS lower limit
Cash interest cover II	1.60	1.54	1.60
Ratio of funds flow from operations to debt	10.5%	10.0%	10.5%
Gearing	55%	52%	55%

In addition to the risks identified, we have set out in our plan innovative solutions, such as reservoir mixing, catchment management, mains flushing, land stabilisation and surface water actions plans to deliver the service and statutory improvements. It is possible that some of these innovative solutions may not deliver the required outcomes and we expect the IR18 investment review to consider the success of these innovative approaches and prioritise investment where appropriate.

Financial reserve

By 2015 we forecast a cash balance of £240 million, which we will then utilise in the 2015 to 2021 period, to finance the delivery of services to customers. By 2021, we forecast a reduced cash balance of £20 million.

Table 11 – Risk analysis

Influences	Risk	Scenario/sensitivity	Estimated Value (£m) of Impact 2015 to 2021
Economic	Economic growth	Household customer base grows by 0.1% per annum more than the assumed 0.74% in our plan	Increase to net additional costs (investment in excess of revenue) in the 2015 to 2021 period, requiring further rephasing of IR18 investment allowances.
	General inflation	If the difference between CPI for prices and RPI for costs was 1% rather than the 0.75% assumed in our plan	The margin between revenue and cost over the period would reduce our cash position by c£80 million.
	Business rates	The potential impact of a business rate revaluation in 2017	Based on the c40% increase across 2010 to 2015, rates revaluation could increase costs by £100 million for the period 2017 to 2021.
	Revenue collection	Impact of Welfare Reform on cash collection	£8 million impact for every 1% reduction in cash collection from case load associated with Welfare Reform.
	Interest charges	An increase in nominal interest rates of 1% relative to our plan assumptions	Increase in costs by c£40 million in the period.
	Accessibility of new borrowing	£100 million reduction in new borrowing availability with no change to investment plans	Charges would have to rise by 0.35% above CPI.
	Fixed nominal prices to 2018	Inflation in the 2015 to 2018 period exceeds the 1.9% assumption in our plan by 0.2%	The margin between revenue and cost over the period would reduce our cash position by c£35 million
Legal and policy	Cryptosporidium	Detections requiring upgrading of any of 20 water treatment works that do not have adequate treatment.	Increased investment of up to £50 million.
	Sludge	Loss of agricultural routes	Increase cash costs by around £50 million.
	Roadwork repairs levy	Proposals to introduce an annual levy of around £5 million	Increase cost of £30 million over the period.
	First Time Provision	Delivery of six waste water projects that SEPA indicated would supply environmental benefit.	Estimated cost £14.5 million.
	One UK Retail Market	Size and scope of the potential changes to the Scottish retail market is at this stage unknown.	Estimated costs at this stage unknown.
	Urban Waste Water Treatment Directive	Compliance with the potential DEFRA position across the UK on Combined Sewer Overflows	An increase in investment of up to £100 million in the period.
	Odour	New sites emerge with statutory requirement to improve	Estimated costs of £10 million to address 8 locations with known low level of complaints not included in this plan.

Monitoring our delivery

Table 12 – Scottish Water’s performance dashboard

Measure to be reported	Expected performance 2015	Expected performance 2021
Measuring customer service		
Overall Performance Assessment (OPA)	380-400	385-400
Household Customer Experience Measure (CEM)	tbc	tbc
Business Customer Experience Measure (CEM)	tbc	tbc
High Esteem Test	to be developed	to be developed
Wholesale KPI	98%	98%
Monitoring financial performance		
Adjusted Cash Interest Cover	1.66	1.61
Funds from operations to net debt	10.8%	10.7%
Gearing	55%	50%
Cash out-performance	n/a	>0
Monitoring Output Delivery		
Delivery of Outputs (OMD Measure)	n/a	To be determined as part of the delivery plan
Q&SIIB completion (OMD Measure)		250
Measuring corporate performance		
Carbon footprint (kg/household)	125	<125
New service measures to be developed		
Security of Supply Index	Band B (97%)	Band B (99%)
Resilience of Supply Index	to be developed	to be developed
Number of properties at risk of external flooding from sewers due to hydraulic overloading	tbc	tbc
Annual number of properties externally flooded from sewers	tbc	tbc

Table 12 sets out the principal factors that we will use with the Output Monitoring Group stakeholders, the Customer Forum and the Commission to monitor our performance over the 2015 to 2021 period. The aim is to ensure that all parties use the same key information in reporting and analysing the performance of Scottish Water against the Strategic Review of Charges 2015 to 2021.

Annual Review Meeting

The Customer Forum and Scottish Water agree that there will be an annual meeting between Scottish Water and the Customer Forum specifically for the purpose of looking at levels of service and performance as represented by: OPA; the CEM; the High Esteem Test; Wholesale KPIs – and the component parts of each; and other agreed service activity measures under development. Following any such meeting the

Customer Forum undertakes to write to Scottish Water identifying any issues of principle it considers relevant to the question of service level and wider performance monitoring, and Scottish Water agrees to consider the issues raised.

Measuring customer service

Overall Performance Assessment (OPA)

We aspire for our OPA performance to be ‘best in class’, and have set out our performance expectations as follows:

- We aspire to be best in class, achieving an equivalent OPA score at, or above, 400 points. It is recognised by the Customer Forum that this is unlikely to happen consistently based on the experience from England and Wales.

- We plan to be leading, achieving an OPA score at, or above, the leading companies' threshold shown in Figure 17. The threshold increase over the period reflects the service improvements set out in this plan. It is acknowledged by the Customer Forum that, occasionally, this may not be achieved because of significant events.
- In recognition of the occasional risk to delivering a leading level of service to customers, we commit to achieving an average OPA score across the 2015 to 2021 period that exceeds the leading companies' performance threshold (i.e. an average score across 2015 to 2021 that exceeds 382.5 OPA points)

Customer Experience Measures (CEM)

The Customer Experience Measures (CEM) are a new measure we propose from 2015 to ensure that delivery of service to customers sits at the heart of what we do and continues to be a key driver of our performance. As explained in the appendices to this plan, CEM represents a development of the key components of the Service Incentive Mechanism (SIM) introduced in England and Wales with some refinement and development to meet the needs of Scottish Water and its customers. We will work with the Customer Forum and other stakeholders to develop how separate CEMs will be calculated for household and business customers and to establish a planned profile of improvement.

We will replace our current customer satisfaction measure with the household and business CEMs which can be disaggregated to compare with the SIM in England and Wales.

Wholesale Key Performance Indicators

We monitor the overall performance of our service to retailers across a range of our activities. This is not only to maintain service

standards, but also to ensure that there is no bias in the provision of services to Licensed Providers. The overall measure takes account of wholesale services and response to requests associated with trade effluent, connections, disconnections and byelaws metering. We will work with Licensed Providers to develop further key performance indicators that meet the needs of the market as it develops.

Monitoring financial performance

We set out in Table 12 the financial parameters that are likely to be required to ensure that Scottish Water maintains an appropriate level of financial strength over the medium to long term. We will monitor these through the tramlines set out by the Commission across the planning period, taking account of both actual and forecast performance.

While the tramlines will monitor the ongoing level of financial strength, it is also important that we continue to monitor our performance against the cash measure that has been used since 2006. Measuring our cash performance ensures that there is transparency between performance due to management action and the favourable or adverse impact of external circumstances on our financial positions.

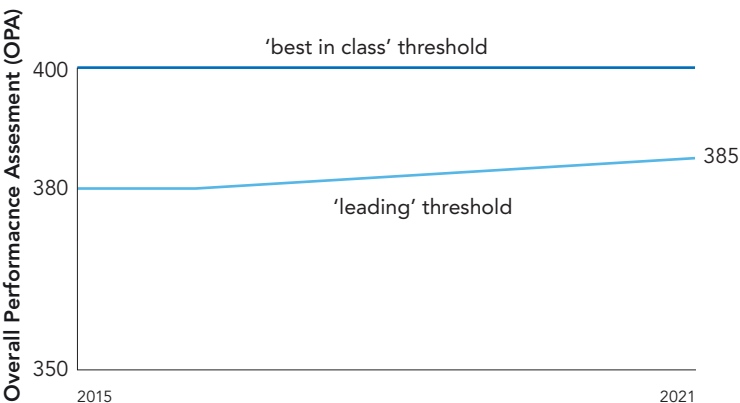
Monitoring output delivery

The Overall Measure of Delivery (OMD) combines information on outputs, time and expenditure to give a single objective measure of investment progress against our plan. Our OMD score for 2015 to 2021 will be established once the final programme of outputs to be delivered has been agreed with stakeholders.

Customer priorities

We have been discussing with the Customer Forum and the Commission particular areas of interest for additional measurements of performance.

Figure 17 – OPA Thresholds



Security of Supply Index (SOSI)

In our research, customers told us that avoiding long term interruptions to supply was a high priority. The Security of Supply Index (SOSI) is an industry indicator of a water company's ability to guarantee provision of its planned level of service in relation to certain drought conditions. Our plan aims to improve our security of supply against drought conditions that have a 1 in 40 year chance of occurring from 97% of supplies to 99%. This means we will have some supplies with marginal deficits under these drought conditions and our SOSI performance will remain in band B. We will continue to use SOSI to monitor how we manage the risk of water supply restrictions in future dry spells until we have fully developed the proposed new Resilience of Supply Index (ROSI).

Resilience of Supply Indicator

We have been working to establish a measure that goes beyond the SOSI to focus on the outcomes to customers and measure the overall resilience of the water service to customers across Scotland, taking account of customer demand, leakage levels, raw water availability, treatment capacity, distribution system resilience and the operational plans that we can implement to manage supplies in extreme circumstances.

We are continuing to develop this and aim to have a new measurement in place by March 2015.

External flooding from sewers

Customers have told us that reducing the risk and incidence of both internal and external flooding from sewers is a high priority for service improvement. Internal flooding is included as part of our OPA whereas external flooding is not. By 2015 we will have established an external flooding register. We therefore plan to report separately our performance on reducing the risk and incidence of external flooding. This will allow us to establish a baseline level of performance during the 2015 to 2021 period and monitor improvements thereafter.

Other areas for development

High Esteem Test (UKCSI)

Scottish Water and the Customer Forum are interested in the opportunity to build a benchmarking comparison which would track customers' satisfaction of Scottish Water alongside other companies in other sectors. We will bring forward proposals for building a robust benchmark tracking survey proposal to the Customer Forum for agreement and implementation by 2015.

Customer Service

We will continue to work with the Customer Forum and other stakeholders to establish baseline measures that can be tracked and implemented in the 2015 to 2021 period as appropriate.

In discussion with the Customer Forum we have identified some other new measures (listed below) that could be added to the dashboard as appropriate:

- External flooding;
- Visible leakage;
- Carbon footprint reduction;
- Extreme weather events excluded from OPA;
- Escalated and upheld complaints to the SPSO;
- Wholesale qualitative measures to complement the Key Performance Indicators; and
- Connections level of service

Asset Health indicator

The intention is to develop a measure that will provide assurance of asset stewardship by monitoring the general state of our portfolio of assets. This will complement other regulatory monitoring tools such as OPA (customer service) and OMD (delivery of enhancement programme) by assessing and potentially forecasting asset performance.

The Asset Health Indicator should allow us to project assurance of forward stewardship; indicating the level of asset health we anticipate will be required to sustain proposed service levels.

We have begun to develop this with the Water Industry Commission staff and expect to pilot this over the 2015 to 2021 period to understand how it works and responds before considering its inclusion on our Performance dashboard.

We provide further detail on our business plan in the following appendices, which are available on our website www.scottishwater.co.uk

Appendix 1: About Scottish Water

Appendix 2: Innovation in delivering services

Appendix 3: Ministers' objectives

Appendix 4: Maintaining current service levels

Appendix 5: Improving drinking water quality

Appendix 6: Improving water services and supply resilience

Appendix 7: Improving the water environment

Appendix 8: Improving waste water services

Appendix 9: Supporting economic development

Appendix 10: Improving the customer experience

Appendix 11: Climate change and carbon

Appendix 12: Investing to reduce cost of service

Appendix 13: Revenues

Appendix 14: Costs and efficiency

Appendix 15: Financial tables

Appendix 16: Business environment, risk and opportunity

Appendix 17: Performance dashboard

Appendix 18: Minute of Agreement between Scottish Water and the Customer Forum

Appendix 19: Customer Forum letter of 30 January 2014 to the Water Industry Commission regarding the Minute of Agreement

For more information on Scottish Water and our services contact our Customer Helpline on **0845 601 8855*** or visit **www.scottishwater.co.uk**. Alternative formats of this leaflet can be made available free of charge. For information on Braille, large print, audio and a variety of languages, please call our Customer Helpline.

* We record all calls for quality and training purposes.

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