Dŵr Cymru
Welsh Water

Ref 5.4

PR19 Past Performance report

September 2018

Contents

1. Introduction

1.1. Purpose of document

This document will set out our actual performance over the first three years of this Price Review (2015 – 2017) and what we forecast our performance to be for the remaining two years to 31 March 2020. We will show how we have made decisions based on the lessons learnt from the 2015-20 period, to inform our PR19 Business Plan. We are confident that our planned improvements and the level of engagement we have with our customers and stakeholders will ensure we deliver our plan.

Our aim is to 'Earn the Trust of our Customers' every day, and we have a set of core values that will ensure that we do this today, and every day moving forward. Our customers can expect;

- Clean safe water for all;
- A personal service that's right for you;
- Safeguard the environment for future generations;
- Put things right if they go wrong;
- Fair bills for everyone; and
- A more sustainable and prosperous future for our communities.

Our plan has been prepared with these values in mind, and we aim to be the supplier of choice for all of our customers.

1.2. Links to other parts of the submission

In addition to this document on past performance, further detail can be found in the following documents:

- PR14 Reconciliation Rulebook;
- PR19 performance commitments

2. Performance 2015-18

2.1. Introduction

The following tables show our actual performance for the period 2015 to 2018. Table 1 shows our performance against the targets and definitions that we originally proposed in our PR14 Business Plan. Table 2 shows our performance against the measures and targets that were set in our Final Determination.

Table 1 – Performance against business plan

2017/18 Annual Performance © calendar year measure	2015/16 Outturn	2015/16 Vs BP Target	2016/17 Outturn	2016/17 Vs BP Target	2017/18 Outturn	2017/18 Vs BP Target
A1: % Sample Compliance ©	99.98%	√	99.99%	√	99.98%	√
A2: Customer acceptability © Inc. private issues.	2.9	√	2.9	√	2.79	√
A3: Reliability of supply	22	√	12	√	43.3	√
B1: Abstraction water for use	100%	√	100%	√	100%	√
B2: Treating used water ©	98.59%	√	99.47%	√	98.21%	√
B3: Preventing pollution © (Cat 1,2 &3)	112	√	114	√	115	√
C1: Adapting to climate change	1,531	√	13,661	√	15,097	√
C2: Carbon footprint	97.37	√	86.50	√	97.89	√
D1: Service Incentive Mechanism (SIM)	9th 5th Wascs	X	13th 7th Wascs	X	10th 5th Wascs	X
D2: At risk' customer services	648	√	575	√	613	√
D3: Properties Flooded in the year	223	X	242	X	221	X
D4: Business customer satisfaction	88%	√	89%	√	87%	X
D5: Earning the Trust of Customers % of customers	81.9%	√	85%	√	84%	√
E1: Affordable Bills	-1%	√	-1%	√	-1%	√
E2: Help for disadvantaged customers	48,734	X	65,461	√	100,999	√
F1: Asset Serviceability	Stable	√	Stable	√	Stable	√
F2: Leakage	179.9	√	175.4	√	172.9	√
F3: Asset resilience - Water	88.2%	√	89.5%	√	90.4%	√
F3: Asset resilience - Waste	73.6%	√	73.6%	√	77.5%	√
G1: Health & Safety	19	√	12	√	14	√
G2: Competence for role	88.1	√	86.6	X	82	X
H2: Financing Efficiency	A/A3/A	√	A/A2/A	√	A/A2/A	√

Table 2 – Performance against final determination

2017/18 Annual Performance	2015/16 Outturn	2015/16 Vs FD Target	2016/17 Outturn	2016/17 Vs FD Target	2017/18 Outturn	2017/18 Vs FD Target	Page
A1: Mean Zonal Compliance (c)	99.96%	X	99.97%	X	99.96%	X	8
A2: Customer Acceptability (c)	3.08	X	3.20	X	3.19	X	9
A3: Reliability of Supply	21.74	√	12.15	√	43.30	X	11
B1: Abstraction for water	100%	√	100%	√	100%	√	13
B2: Treating used water (c)	98.59%	X	99.47%	X	98.21%	X	14
B3: Pollution Incidents (c)	110	√	111	√	112	√	16
C1: Responding to Climate Change	1531	√	13661	√	15097	√	18
C2: Carbon Footprint	97.37	√	86.50	√	97.89	√	19
D1: SIM	83	X	83	X	85	X	20
D2: At Risk – Customer Service	648	√	575	√	613	√	21
D3: Properties flooded in the year	223	√	242	√	221	√	22
D4: Business Customer Satisfaction	88%	√	89%	√	87%	X	24
D5: Earning the Trust of Customers	81.9%	√	85%	√	84%	√	26
E1: Affordable Bills	-1%	√	-1%	√	-1%	√	26
E2: Help for Disadvantaged Customers	48734	X	65461	√	100999	√	27
F1: Asset Serviceability	Stable	√	Stable	√	Stable	√	29
F2: Leakage	180	√	175.43	√	172.85	√	30
F3: Asset Resilience – Water	88.20%	√	89.50%	√	90.40%	√	31
F3: Asset Resilience – Wastewater	73.60%	√	73.60%	√	77.50%	√	32

2.2. Outcome and performance commitments 2015/16 – 2019/20

In this chapter, we demonstrate how we have performed to date, and what we forecast our performance to be for the remaining years of this AMP in meeting our outcomes and performance commitments.

2.3. Measures of success performance 2015/16 -2019/20

This chapter gives further detail on each of our MOS and how we have learnt from past performance to inform our planned improvements for the remaining two years of the current AMP. For those measures that remain unchanged in PR19, we have shown our forecast targets. A full list of our PR19 targets is contained within our Delivering Outcomes for Customers document

At PR14 we had 31 MOS, the table below reports the number of MOS FD targets that were met.

	2015/16	2016/17	2017/18	2018/19	2019/20
No of Performance targets met	23	24	21	28	28
% no of Performance targets met	74%	77%	68%	90%	90%
No of Performance targets not met	8	7	10	3	3
% no of Performance targets not met	26%	23%	32%	10%	10%
Total MOS	31	31	31	31	31

Note the PR14 Reconciliation Rulebook states that the number of performance targets met in 2015/16 is 24 in line with the APR. The number met is 23 as we restated E2: Help for Disadvantaged Customers.

PR14 FD - Outcome 1 – Customers will have complete confidence that their drinking water is safe, reliable and tastes good.

A1: Mean zonal compliance

Definition - MZC is published annually in the Chief Inspector's Report and is the primary measure used by DWI to compare overall water quality performance between water companies and regions of England and Wales. It comprises the average of the MZC % figures for 39 different parameters that are tested to establish the quality of water as received by customers.

There are regulatory standards for sampling frequency set for each of the 39 parameters depending of the size of the population being served from the water quality zone. We have 82 water quality zones with some serving very small populations.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	99.98%	99.98%	100%	100%	100%
PR14 BP Target	99.98%	99.98%	99.98%	99.98%	99.99%
Outturn/Forecast	99.96%	99.97%	99.96%	99.98%	99.98%

2015/16 Commentary - In terms of performance against the MZC measure, all but 22 of the 45,168 tests met the required quality standard. This equates to 99.96% compliance. This

MZC performance was affected by failures on parameters such as Iron, Manganese and Lead. In 2014 the performance was 99.94%, with 33 of the 44,995 tests performed not meeting the required quality standard.

2016/17 Commentary - In 2016, there were 20 failures out of some 45,500 tests taken compared to 22 failures in 2015.

2017/18 Commentary - In 2017 our performance level was 99.96%. There were 32 failures out of 45,844 tests taken compared to 20 failures in 2016. The highest number of failures was on the 'Iron' parameter.

Achieving 100% compliance target is challenging as a failure in zones serving very small populations will distort the overall picture. We nevertheless, continue to work towards achieving the FD target through planned investment and improved operating procedures.

Lessons learnt from past performance and our planned improvements.

Amongst the many initiatives aimed at driving improvement in performance are the following:

- Zonal studies which target investment into cleansing and replacing those pipes that give rise to discolouration contacts, chiefly cast iron mains;
- Operational strategy for Water Treatment Works (WTWs), in particular the taste and odour management strategy for the treatment of Geosmin and Methylisoborneol (MIB) that will reduce the risk of taste and odour compliance failures;
- Lead strategy, including the replacement of both communication pipes and customer owned service pipes which in the long term will lead to a steady reduction in the risk of lead compliance failures;
- Our disinfection strategy at WTWs and our three year cleansing and maintenance programme at our service reservoirs will improve the bacteriological quality of water supplied to customers; and
- We are working with the Water Regulations Advisory Scheme (WRAS) to help address issues that arise from work carried out by non-approved plumbers and the use of non-approved plumbing materials, which help eliminate future nickel failures.

A2: Customer acceptability

Definition: The number of contacts received from customers in the calendar year regarding the appearance, taste or odour of drinking water per 1,000 population served.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	2.54	1.89	1.23	1.23	1.23
PR14 BP Target	3.20	3.20	3.10	3.00	2.90
Outturn/Forecast	3.08 *	3.20	3.19	2.90	2.75

**In 2015, we reported a figure of 2.91 contacts per 1,000 population. We explained that we had excluded from this measure contacts from customers where the problems arose from customers' own private plumbing. We are now reporting all customer contacts in line with*

data submitted to the DWI, including the private plumbing customer contacts. We also restated the 2015 number.

2015/16 Commentary - Our performance on this measure for 2015 (3.08) was a significant improvement from 2014.

This was achieved through the delivery of a number of initiatives, which were all part of our Customer Acceptability Strategy. Daily performance reporting helped increase awareness and focused management attention on improving performance. Operational practices were continually reviewed and amongst the areas of improvement identified were:

- Improved operational responses to discolouration contacts;
- Investment at Water Treatment Works to reduce the risk of discolouration and contacts from our customers on taste and odour;
- Cleansing of two trunk mains (in Abergele and in the Tredegar valley);
- Deployment of lockable covers to protect the network and restrict third party access; and
- Refresher training of network inspectors and the development of new training modules.

2016/17 Commentary - Our performance on this measure for 2016 was 3.20 contacts per 1,000 population. Internally, we monitor and report those customer contacts that arise from problems associated with our assets, i.e. not including contacts which are linked to customers' own plumbing. There were around 1,000 customer contacts that arose from issues with private plumbing in 2016.

2017/18 Commentary - Our 2017 performance on this measure was 3.19 contacts per 1,000 population. This was an improvement on the 2016 figure of 3.2 contacts per 1,000 population. Internally, we monitor and report those customer contacts that arise from problems associated with our assets, i.e. not including contacts which are linked to customers' own plumbing. There were around 1,250 customer contacts that arose from issues with private plumbing in 2017.

The targets set for the latter years of this AMP period are very challenging. Whilst significant investment is planned, and management attention is focused on this key measure, we will struggle to achieve these targets. In 2017/18 we incurred a penalty of £1.86m.

Lessons learnt from past performance and our planned improvements.

Compared with other companies in the industry, we are an outlier in performance. Although we are taking steps to improve the position, there are underlying circumstances which are beyond our control, such as the quality of raw water, which affect this measure. We believe that the root cause of discolouration contacts being higher in Wales is related to the prevalent type of source water, which are typically soft and high in manganese.

Amongst the many initiatives aimed at driving improvement in performance are the following:

- Zonal studies which target investment into cleansing and replacing those pipes that give rise to discolouration contacts, chiefly cast iron mains;

- Proactively tackling the impact of third parties' interference. This includes initiatives such as locking down hydrants (6,500 to date) and replacing warning signs on this apparatus, where appropriate;
- Adopting innovative solutions - there are currently 44 innovation projects in place targeting improvements; and
- Developing a Manganese Strategy comprising catchment management and process improvements, aimed at reducing the level of manganese from works, both in the short and long term.

A3: Reliability of supply

Definition: Average minutes of supply interruption per property within our supply area (includes both planned and unplanned interruptions) as defined for the Ofwat key performance indicator (KPI) in IN 13/03.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	36	24	12	12	12
PR14 BP Target	48	47	46	44	43
Outturn/Forecast	21.74	12.15	43.3	12	12

2015/16 Commentary - In this year, our performance on customer minutes lost (CML) improved to 21.74 minutes from 23 minutes in 2014/15. This was achieved through a review of operational practices and the delivery of a 'CML Operational Improvement Strategy'. Some of the initiatives that contributed to this improvement were:

- The increased use of non-disruptive techniques to complete repair and maintenance activities;
- Frequent utilisation of the emergency planning fleet and equipment to maintain supplies to customers by pumping potable water from tankers directly into water mains;
- The implementation of detailed planning escalation and post event review processes;
- Increasing the knowledge and awareness of operational colleagues through the use of new training rigs at two of our key sites;
- The deployment of pressure loggers during interruption events; and
- Undertaking zonal studies and analysing the worst performing water quality zones.

2016/17 Commentary - In this year, our performance on customer minutes lost (CML) improved significantly to 12.15 minutes (12 minutes, 9 seconds) from 21.74 minutes in 2015/16. This was achieved through the delivery of an Interruptions Operational Improvement Strategy, including:

- Improved planning and delivery of work through the use of non-disruptive techniques. All significant maintenance and repair work is now subject to thorough planning processes which consider potential alternatives to interrupting supplies to customers;
- Increasing the knowledge and awareness of staff through training and optimising the use of the two valve operation training centres to ensure that staff are fully

conversant with the techniques in place to prevent pressure fluctuations and hence reduce the risk of burst mains;
- Continuing to deploy pressure loggers during interruption events;
- Improved network analysis associated with data sources at a significant number of pressure points across the network;
- Utilisation of and the increased use of the emergency planning fleet and equipment to help maintain supplies during operational incidents; and
- The implementation of post incident reviews on all significant bursts to prevent recurrence.

2017/18 Commentary – In this year, our performance on customer minutes lost (CML) was 43.3 minutes, compared to 12.15 minutes in 2016/17. In early March 2018 we experienced extremely challenging weather conditions across our area – Storm Emma. A Meteorological Office 'Red' warning was issued on 1 March which led to large volumes of snowfall impacting on much of our operating area. Although we did everything possible to minimise the disruption, the freeze thaw which followed added to the problem and, as a result, some 30,000 properties (approximately 2.8% of our customer base) were affected.

If this severe weather incident had not occurred, our performance would have been around 15 customer minutes lost. In this year we incurred a penalty of £3.9m.

Lessons learnt from past performance and our planned improvements.

Although this is an area upon which there is a great deal of management focus, there are specific weather related reasons why performance has deteriorated.

We continue to focus attention on improving performance and amongst the steps in place are:

- Improved planning and delivery of work through the use of non-disruptive techniques;
- Increasing the knowledge and awareness of staff through training;
- Utilisation of and the increased use of the emergency planning fleet and equipment to help maintain supplies during operational incidents;
- the implementation of post incident reviews on all significant bursts to prevent recurrence;
- Delivery of water mains repairs through a new Network Maintenance Alliance contract which will be in place by autumn 2018. This will facilitate an innovative and collaborative approach aimed at minimising disruptions to customers and reducing customer minutes lost;
- Strengthening the response capabilities of both our in house teams and our contracting partners; and
- Implementing a Zonal study investment programme to address the high burst frequency on our mains, ensuring that the investment is targeted in those areas where the risk of interruptions is greatest.

PR14 FD - Outcome 2 – We will safeguard a sustainable environment that we are proud to hand on to future generations.

B1: Abstraction for water

Definition: Percentage compliance with our abstraction licences, as regulated by Natural Resources Wales.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	100%	100%	100%	100%	100%
PR14 BP Target	100%	100%	100%	100%	100%
Outturn/Forecast	100%	100%	100%	100%	100%

2015/16 Commentary - A minor non-compliance occurred for one day (on 21st October 2015). NRW categorised this as a C3 incident, (i.e. a non-compliance which could have a minor environmental effect). Having regard to this minor non-compliance, our % score on this measure would be 99.998% (rounded to 100%).

2016/17 Commentary - Two minor non compliances occurred (at Afon Gwril and Llyn Alaw). NRW categorised these as category 3 incidents, (i.e. a non-compliance which could have a minor environmental effect). Having regard to these minor non-compliance occurrences, our % score on this measure was 99.992% (rounded to 100%).

2017/18 Commentary - One Category 3 non-compliance occurred in this year. This lasted for one day only. A category 3 incident is one where a non-compliance could have a minor environmental effect. Having regard to this minor non-compliance occurrence, our % score on this measure was 99.998% (rounded to 100%).

B2:– Treating used water

Definition: The % compliance of wastewater treatment works with our discharge permits.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	100%	100%	100%	100%	100%
PR14 BP Target	97.50%	97.50%	98.00%	98.50%	99.00%
Outturn/Forecast	98.59%	99.47%	98.21%	98.90%	99.00%

2015/16 Commentary - Our performance for 2015 (98.59% compliance) was based on eight Waste Water Treatment Works (WWTWs) failing, out of a total of 567 WWTWs with numeric permits. This compares to 99.13% in 2014 (five failures out of 572 WWTWs). However, this year was one of the wettest years on record and partly explains the slight deterioration in performance. We put in place a 'compliance strategy' and amongst the initiatives and deliverables during the year were:

- Awareness and refresher training, including rolling out a competent operating programme;
- Capital investment and the delivery of several improvement schemes;
- A move towards more proactive maintenance techniques which reduced the volume of unplanned maintenance failures;

- The deployment of Integrated Management System techniques, including audits and the implementation of continuous improvement procedures; and
- The adoption of Leading Edge Assets and People (LEAN) processes to realise efficiencies at WWTWs.

2016/17 Commentary - Our performance for 2016 (99.47% compliance) was based on three Waste Water Treatment Works (WWTWs) failing, out of a total of 567 WWTWs with numeric permits. This compares to 98.59% in 2015 (eight failures out of 567 WWTWs). This result represented our best ever performance. This was achieved through improved ways of working, including;

- Shared learning of what causes sample failures;
- Better data and management reporting;
- Capital investment to tackle high priority challenges; and
- The adoption of Leading Edge Assets and People (LEAN) processes to realise efficiencies at WWTWs.

2017/18 Commentary - Our performance for 2017 was 98.21% compared to 99.47% in 2016. This was based on ten Waste Water Treatment Works (WWTWs) failing, out of a total of 559 WWTWs with numeric permits. This was the lowest number of total regulatory sample exceedances since 2012.

Five of the ten failures coincided with challenging weather conditions in April 2017 following a period of very dry weather. As a result, the concentration strength of the flow arriving at our WWTWs caused treatment and process difficulties in certain areas. These were judged by NRW as not having any significant environmental impact.

We will continue to strive towards a 100% target and build on this year's performance through strategic investment and the implementation of predictive analytics, improved systems and LEAN processes.

Lessons learnt from past performance and our planned improvements.

The current compliance strategy has delivered an improvement in performance in the last few years, particularly in operator competence and awareness, Ultra Violet (UV) compliance and Urban Wastewater Treatment Directive (UWWTD) compliance. However, the performance in 2017 has led to a comprehensive review of the strategy with the aim of achieving 100% WWTW compliance and our vision of "All works being compliant all of the time".

We will improve through:

- The use of our operational and maintenance data to identify deteriorating trends;
- The use of statistical analysis and predictive analytics to forecast potential sample exceedances;
- Earlier intervention by process science teams aimed at preventing non- compliance;
- Continuing to test and deploy temporary mobile treatment equipment when small WWTWs are struggling to perform;
- Improving sludge handling and treatment to prevent sludge being held in process tanks;
- Shared learning of what causes sample failures;

- Targeted capital investment to tackle high priority challenges; and
- The adoption of Leading Edge Assets and People (LEAN) processes to realise efficiencies at WWTWs.

B3: Pollution incidents

Definition: The total number of category 3 pollution incidents as reported by NRW within the calendar year.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	161	154	131	131	131
PR14 BP Target	200	190	180	170	150
Outturn/Forecast	110	111	112	113	112

2015/16 Commentary - Overall, the total number of category 3 pollution incidents during the year fell from 117 to 110. This is our best ever performance. This number included pollution incidents arising from private sewers transferred (PST) to the company in 2011.

We implemented a number of initiatives, to help reduce the risk of pollution including:

- Sewer hotspot analysis, developed using historic incident and data driven targeted proactive maintenance and intervention;
- Development of a smarter control room, to support alarm management and responses, e.g. at pumping stations; and
- Wider roll out of our "Let's Stop the Block" education campaign to discourage people from flushing everyday items like cotton buds and wet wipes down the toilet, or rinsing things like fat, oil and food scrapings down the sink which can result in sewer blockages.

Our performance in the year resulted in us earning a notional reward of almost £1m.

In addition, there were two Category 2 incidents in the year (four in 2014). There were no Category 1 incidents.

2016/17 Commentary - Overall, the total number of category 3 pollution incidents during the year was 111 (110 in 2015/16). This number included pollution incidents arising from private sewers transferred (PST) to the company in 2011.

We implemented a number of initiatives to help reduce the risk of pollution including:

- An Event Duration Monitoring Project, ensuring that all intermittent assets will have some form of telemetry and allowing us to respond swiftly to operational incidents and take preventative measures;
- Installation of flow monitors at pumping stations deemed to have a higher risk of pollution, allowing pro-active interventions before problems arise;
- Raising public awareness around the risks associated with sewer blockages including television and radio campaigns, open days at Waste Water Treatment Works and other local initiatives; and
- Utilisation of the Smarthub telemetry and control team to support alarm management and ensure that we respond swiftly to potential issues.

Our performance in the year resulted in us earning a notional reward of £940k. Last year's notional reward for out-performance was £987k.

2017/18 Commentary - Overall, the total number of category 3 pollution incidents (low impact) during the year was 112 (111 in 2016/17). In addition, there were two Category 2 incidents in the year and one Category 1 incident. The Category 1 incident was the result of silt from an excavation entering a watercourse whilst we were repairing a clean water mains burst in Neath in February 2017.

On 1 April 2017, NRW introduced a new incident Categorisation Guidance (which classifies incident by reference to their impact). This year, we have reported to NRW on this new basis. High Level incidents (major and significant) equate to what were regarded as Serious Incidents (Categories 1 and 2 respectively). Low Level incidents are equivalent to Category 3.

Our performance in the year has resulted in us earning a notional reward of £893k. In 2015/16 and 2016/17 the respective rewards earned were £987k and £940k. The cumulative reward for the first three years of the AMP6 period is £2.820m

Lessons learnt from past performance and our planned improvements.

We have in place a number of initiatives to help reduce the risk of pollution, including:

- The implementation of an Event Duration Monitoring Project, ensuring that all intermittent assets will have some form of telemetry and allowing us to respond swiftly to operational incidents and take preventative measures;
- A Water Pollution Improvement Plan has been developed. Outputs include a review of silt mitigation measures employed on site, updates to the Emergency Response plans and environmental awareness sessions;
- Pressure and condition monitoring to provide early warning of rising mains bursts, allowing us to rapidly respond and mitigate any impacts;
- Raising public awareness around the risks associated with sewer blockages including television and radio campaigns, open days at Waste Water Treatment Works and other local initiatives;
- Utilisation of the Smarthub telemetry and control team to support alarm management and ensure that we respond swiftly to potential issues; and
- Adoption of industry best practices to improve our understanding of asset performance.

PR14 FD - Outcome 3 – We will adapt our activities to deal with the potential effects of climate change, while reducing our own carbon footprint.

C1: Responding to climate change

Definition: This measure reflects the completion of schemes to reduce the amount of surface water entering the company's systems. The measure is the volume of surface water removed from the system, expressed in number of properties equivalent. The company has defined the property equivalent volume as 100m3 per year.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	1000	1000	15000	20000	25000
PR14 BP Target	1000	10000	15000	20000	25000
Outturn/Forecast	1531	13661	15097	20000	25000

2015/16 Commentary - The completion of eight Rainscape schemes across our area meant that we exceeded the target set for the year. This performance equates to the removal of water running off the roofs of 1,531 properties which would otherwise have discharged into our sewers. These schemes are at a number of locations including Llanelli, Abergavenny and Llanberis.

2016/17 Commentary - During 2016/17, we delivered nine RainScape schemes to remove surface water from our combined sewer systems, equivalent to 12,130 rooftops. This means that we achieved the target set for the year.

Of this total, a major scheme at Mumbles (Dunns Lane) removed an equivalent of water running off 9,757 rooftops. In addition to the removal of highway and roof drainage, surface water flows from a culverted watercourse were disconnected from the combined sewer. Cumulatively, over the first two years, the number was 13,661 properties. This water would otherwise have discharged into our sewers. These schemes are at a number of locations including Swansea, Llanelli and Anglesey.

2017/18 Commentary - During 2017/18, we delivered four RainScape schemes to remove surface water from our combined sewer systems, equivalent to 1,436 rooftops. This meant that we achieved the target set for the year.

Amongst the schemes completed in the year were the removal of an impermeable area and land drains connected to combined sewers at locations in the Pwll area of Llanelli. We also removed a land drain and roof drainage entering a trunk sewer at Trelewis, Merthyr Tydfil.

Lessons learnt from past performance and our planned improvements.

We have a programme of investment, with identified schemes which will be delivered in 2018/19. This will contribute to achieving our target of removing the equivalent of water escaping from 25,000 roof tops by March 2020.

C2: Carbon footprint

Definition: The total GWh of renewable energy generated within the year.

Water

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	7.11	9.78	12.45	15.11	17.78
PR14 BP Target	7.11	9.78	12.45	15.11	17.78
Outturn/Forecast	50.21	37.49	42.38	52.90	55.60

Waste

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	32.89	45.22	57.55	69.89	1082.22
PR14 BP Target	32.89	45.22	57.55	69.89	82.22
Outturn/Forecast	47.16	49.01	55.51	60.2	69.7

2015/16 Commentary - Our performance on this measure was 97 GWh against a combined target of 80 GWh. On Water, there was a significant increase in our renewable generation

from 2014/15 (14 GWh to 50 GWh), largely attributable to the full year effect of an acquisition of the Infinis hydro generation assets in February 2015.

2016/17 Commentary - Our performance on this measure was 86.5 GWh of renewable energy generated, as against a combined target of 55 GWh. Renewable generation reduced from the 2015/16 total of 97 GWh to a total of 87 GWh for 2016/17.

Above average rainfall in 2015/16 led to an out-performance of 7 GWh in that year across our hydro assets. Lower than average rainfall in 2016/17 reduced the total generation from our hydro assets by a further 4 GWh. This reduction was compounded by a failure of Claerwen hydro turbine (4 GWh reduction) and an issue with the alternators on the CHP engines at Cardiff WwTW (costing 2 GWh). Elsewhere there were success stories from our Gas to Grid, small hydro, Solar PV and Wind sites as they all increased output by a combined 7 GWh.

2017/18 Commentary - Our performance on this measure was 98 GWh of renewable energy generated (86 GWh in 2016/17), as against a combined target of 70 GWh.

The rise in generation on the water side of the business was from improved hydro generation, from 37 GWh to 42 GWh. Our first full year of wind energy generation resulted in an increase of 5 GWh. On the wastewater side of the business, Anaerobic Digestion in total was unchanged. The increase from the new Organic Energy plant at Cardiff was offset by issues at Cardiff Waste Water Treatment Works (WWTW) (electricity network restrictions) and Afan WWTW (major engine maintenance).

Lessons learnt from past performance and our planned improvements.

Amongst the initiatives for 2018/19 are:

- An Advanced Anaerobic Digestion scheme at Five Fords WWTW, Wrexham. This is in the course of construction and will be in use in 2019; and
- A further phase of solar Photovoltaics installations which will more than double our installed solar capacity.

PR14 FD - Outcome 4 – Our customer service will be as good as the best utility companies in the UK.

D1: SIM

Definition: SIM score as defined in Ofwat's SIM guidance.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	Top Quartile	Top Quartile	Top Quartile	Top Quartile	Top Quartile
PR14 BP Target	Top Quartile	Top Quartile	Top Quartile	Top Quartile	Top Quartile
Outturn/Forecast	Joint 9th (5th Wascs)	13th (7th Wascs)	10th (5th Wascs)	Top Quartile	Top Quartile

This measure only applies to household customers.

Non-household SIM

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	Top Quartile	Top Quartile	Top Quartile	Top Quartile	Top Quartile
PR14 BP Target	Top Quartile	Top Quartile	Top Quartile	Top Quartile	Top Quartile
Outturn/Forecast	19/21 (8th Wascs)	20/21 (9th Wascs)	Not yet available	Top Quartile	Top Quartile

2015/16 Commentary - By reference to the formula used to calculate the overall score, our SIM combined score for this year was 83, which is an improvement on the 2014/15 score of 82. On the qualitative element of the assessment, we have achieved our target of top quartile performance.

2016/17 Commentary - By reference to the formula used to calculate the overall score, our SIM combined score for this year was 83, which was the same score as 2015/16. On the qualitative element of the assessment, we were ranked fifth out of the ten Water and Sewerage companies.

For 2015/16, we finished fifth of the ten Water and Sewerage companies.

Our performance on non-household customer satisfaction improved from 88% in 2015/16 to 89% this year.

2017/18 Commentary - By reference to the formula used to calculate the overall score, our SIM combined score for the year was 85, which was an improvement on the 2016/17 score of 83. On the qualitative element of the assessment, we were ranked fifth out of the ten Water and Sewerage companies. For 2016/17, we finished seventh of the ten Water and Sewerage companies.

The number of complaints from Non household customers has reduced by some 50% (1,152 to 574) in 2017/18. We anticipate that this improvement in performance will have a significant effect on our ranking when comparative information becomes available later this year.

Lessons learnt from past performance and our planned improvements.

With a view to reducing the volume of complaints we are:

- Launching a new system 'Customer Desk Top' platform which will allow us to view all customer contacts received and improve service;
- Continuing our Customer Led Success training programme. We will be reviewing how we use feedback from customers to ensure we improve service and reduce complaints; and
- Adopting an 'Own it, Sort it' culture to ensure that queries are resolved on the first contact, where possible.

D2: At risk customer service

Definition: The number of customers who are on our register of "at risk" at the end of the financial year. They are deemed to be "at risk" because their service has repeatedly fallen short in one of the following five areas: discolouration of water, interruptions to supply, low pressure, and odour from wastewater assets and sewer flooding.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	850	750	650	550	425
PR14 BP Target	850	750	650	550	425
Outturn/Forecast	648	575	613	550	425

2015/16 Commentary - We had 648 customers on our 'At Risk Register' at the end of 2015/16. This was an improvement on the 2014/15 figure of 702 and was below our target of 850. The number of customers on the sewer flooding element of the 'At Risk Register' increased in the year but 23 of the 85 incidents reported were attributable to issues arising from sewerage assets that were previously classified as privately owned.

By contrast, performance on the water element of this measure improved overall, with a noticeable decrease in the number of customers on the supply interruptions element of the 'At Risk Register' (415 as against 519 in 2014/15).

2016/17 Commentary - We had 575 customers on our 'At Risk Register' at the end of the year. This was an improvement on the 2015/16 figure of 648 and was below our target of 750. Our performance on four of the five sub areas improved this year. Customer contacts discolouration saw a slight deterioration from 53 in 2015/16 to 63 in this year.

2017/18 Commentary - We had 613 customers on our 'At Risk Register' at the end of 2017/18 (575 in 2016/17). Our performance on three of the five sub areas improved in the year. The increase in the number of customers at risk of supply interruptions was largely due to the adverse weather conditions experienced in March 2018.

Sewer flooding increased from 70 to 89 in the course of the year and the increase was largely due to the effects of an exceptional weather event in July 2017, affecting Rhyl, Abergele and Prestatyn.

Lessons learnt from past performance and our planned improvements.

We are assessing assets in the Rhyl area with a view to providing greater catchment resilience to severe weather events and have also installed mitigation measures to protect properties in the Tywyn area of Rhyl, ahead of developing a permanent solution.

D3: Properties flooded in the year

Definition: The number of properties suffering internal sewer flooding per year (not including flooding due to the most severe weather), in line with the KPI set out in IN 13/03. This measure includes flooding attributed to assets that transferred to the company on 1 October 2011 under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	310	300	292	282	269
PR14 BP Target	196	186	176	166	155
Outturn/Forecast	223	242	221	223	222

2015/16 Commentary - This was our best ever performance with the number of properties affected by sewer flooding (223) falling, the equivalent figure in 2014/15 being 265. This was

largely as a result of investment in our assets, and to a number of initiatives aimed at tackling blockages, collapses and equipment failures. These included:

- Over £10m invested in Deeside, Wrexham and Shropshire in AMP5 to remove flood-risk for 131 properties. The region experienced significant storms in early September 2015, but none of the 'resolved' properties benefitting from this investment were affected by flooding;
- Continuation of 'Project Resilience', improving the condition and reliability of our Sewage Pumping Stations;
- Our 'Let's Stop the Block' communications campaign, increasing awareness of the role customers can play in helping reduce sewer blockages, flooding and pollution; and
- Cleansing of around 25km of sewers, with a focus on preventing sewer flooding.

2016/17 Commentary - Our performance in the year was 242 as against 223 in 2015/16. Amongst the initiatives aimed at tackling blockages, collapses and equipment failures were:

- Ongoing capital investment, focusing on resolving problems where the risk of flooding is highest, e.g at Hirwaun and Caerphilly;
- Continuation of 'Project Resilience', improving the condition and reliability of our Sewage Pumping Stations;
- Our 'Let's Stop the Block' communications campaign, increasing awareness of the role customers can play in helping reduce sewer blockages, flooding and pollution; and
- Cleansing of around 28km of sewers, with a focus on preventing sewer flooding.

Rewards/Penalties for this measure are based on a two year average assessment. Our performance over the last two years means that we earned a notional reward of £1.86m.

2017/18 Commentary - Our performance in the year improved with 221 properties affected by sewer flooding, compared to 242 in 2016/17. Our performance over the last two years means that we earned a notional reward of £1.488m.

Lessons learnt from past performance and our planned improvements.

Amongst the initiatives aimed at tackling blockages, collapses and equipment failures and driving good performance are:

- Ongoing capital investment, focusing on resolving problems where the risk of flooding is highest. By 2020 we will have spent some £37m across the sewer flooding programme;
- Continuation of 'Project Resilience', improving the condition and reliability of our Sewage Pumping Stations;
- Our 'Let's Stop the Block' communications campaign, increasing awareness of the role customers can play in helping reduce sewer blockages, flooding and pollution; and
- Refurbishment of around 18km of gravity sewers, with a focus on preventing sewer flooding.

D4: Business customer satisfaction

Definition: Percentage level of satisfaction across the company's non-household customer base measured as the average performance over two consecutive six month surveys.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	87%	88%	89%	90%	90%
PR14 BP Target	87%	88%	89%	90%	90%
Outturn/Forecast	88%	89%	87%	90%	90%

2015/16 Commentary - Our performance of 88% on this MOS, is in line with the target.

Opinion Research Services (ORS) undertake a random sample of 500 satisfaction surveys for our non-household customers every six months. The first survey took place in September 2015 and the second survey was in March 2016. The scores from these surveys were 4.35 and 4.45 respectively. The score for the year has been calculated by taking the average of the two surveys and then dividing by the maximum score of 5 to provide the satisfaction percentage for the year.

2016/17 Commentary - Our performance of 89% on this MOS, is above the target of 88%. ORS undertook their first survey in July/August 2016 and the second survey was in February/March 2017. The scores from these surveys were 4.48 and 4.43 respectively. The score for the year has been calculated by taking the average of the two surveys and then dividing by the maximum score of 5 to provide the satisfaction percentage for the year.

2017/18 Commentary - Our performance of 87% on this MOS, is below the target of 89%. Accent undertake a random sample of 500 satisfaction surveys for our non-household (NHH) customers every six months. The first survey took place in July/August 2017 and the second survey was in January/February 2018. The scores from these surveys were 4.39 and 4.35 respectively giving us a combined score of 4.37. The score for the year has been calculated by taking the average of the two surveys and then dividing by the maximum score of 5 to provide the satisfaction percentage for the year.

We recognise that there are likely to be fluctuations in customer satisfaction views and we have seen this with the survey undertaken in January/February 2018.

However, we believe that the score remains within the boundary of natural volatility, and is not symptomatic of a fundamental problem and this is confirmed in the latest Accent Report.

Although falling slightly short of the target, a score of 87% (average of 88% over the last four years) demonstrates a high degree of customer satisfaction and is well above the penalty zone.

Lessons learnt from past performance and our planned improvements.

Our Customer Led Success strategy will continue to help ensure that NHH customers enjoy a very high level of customer service and we believe that this will be reflected in future satisfaction scores.

Amongst the initiatives are:

- A re-organisation which, for the first time, has provided a specific Director focus on our ineligible NHH customers;
- Engaging with the NHH customers on a regular basis;
- The appointment of relationship managers for NHH customers who request a relationship management service;
- Implementation of an electronic billing system for NHH customers; and
- An improved and expanded range of added value products and services to support our NHH customers.

D5: Earning the trust of customers

Definition: This measure is derived from the output of an annual survey of our customers. The measure is the percentage of customers who confirm they trust us.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	63%	66%	68%	71%	75%
PR14 BP Target	63%	66%	68%	71%	75%
Outturn/Forecast	81.9%	85%	84%	84%	85%

2015/16 Commentary - To understand the levels of trust of our customers, we undertook a programme of research to survey both household and non-household customers. The research was undertaken through computer assisted telephone interviewing, conducted by Accent. Customers are asked a series of questions about Welsh Water and the services it provides - including a question asking if customers' "trust Welsh Water to do the right thing" which is used as the basis for this measure.

Our performance of 81.9% was based on the average of the two surveys undertaken in the year. The respective scores in the year were 81.4% and 82.4%.

2016/17 Commentary - Our performance of 85% was based on the average of the two surveys undertaken in the year. The respective scores in the year were 84% and 86%.

2017/18 Commentary - Our performance of 84% (85% in 2016/17) was based on an annual survey undertaken in the year.

Lessons learnt from past performance and our planned improvements.

Amongst the initiatives aimed at securing the trust of customers:

- Further embedding 'Customer Led Success' within the culture, strategic thinking and operational work of the company;
- Regional roadshows and targeted events to showcase our impact on the region and our planned investment;
- Raising our profile through targeted media campaigns, including TV and radio advertising; and
- Developing our 'On line community' to engage more effectively with customers.

PR14 FD Outcome 5 – Our prices will reflect good value for money for our customers with an effective range of help for those struggling to pay

E1: Affordable bills

Definition: The extent to which the company will continue to make bills more affordable. Customer bill increases will be 1% below the rate of inflation each year.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	-1%	-1%	-1%	-1%	-1%
PR14 BP Target	-1%	-1%	-1%	-1%	-1%
Outturn/Forecast	-1%	-1%	-1%	-1%	-1%

2015/16 Commentary - During the year, household charges for 2016/17 have been set to meet the Revenue Controls and keep the average household bill at £438. At a time when annual inflation, as measured by RPI, was 1.05%, this meant that we achieved our target of keeping the average household customer bill at 1% below inflation.

2016/17 Commentary - This measure is set at a company-wide basis and applies to all four price controls.

The household measure (i.e. wholesale water, wholesale wastewater and household retail) is measured by reference to the change in the average household bill. The non-household measure (i.e. wholesale water, wholesale wastewater and non-household retail) is measured by reference to the change in the average non-household bill.

The change in average household bill from 2016/17 to 2017/18 was 1.9% below inflation. The change in average non-household bill from 2016/17 to 2017/18 was 0.9% below inflation.

2017/18 Commentary - The change in average household bill set for the period covered by this report was 1.9% below inflation. The change in average non-household bill set for the period covered by this report was 0.9% below inflation.

E2: Help for disadvantaged customers

Definition: The number of customers benefiting from social tariffs.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	52000	65000	75000	85000	100000
PR14 BP Target	52000	65000	75000	85000	100000
Outturn/Forecast	48734*	65461	100999	100000	100000

**To ensure consistency we restated the 2015/16 number from 54,845 to 48,734. The 2014 Final Determination target includes five of the six 'Social tariffs / means of assistance. Customers who benefit from 'Water collect' are excluded from our performance.*

2015/16 Commentary - Our performance was 54,845 (including Water collect) and 48,734 (excluding Water collect).

2016/17 Commentary - Our 2016/17 performance was 65,461 against a target of 65,000 and represented an improvement on the 2015/16 performance.

Customers who benefit from Water Collect were not included in the 2016/17 figure of 65,461. If Water Collect customers were added to the 65,461 the total number of customers benefitting from a social tariff / means of assistance would be 71,167.

2017/18 Commentary - Our 2017/18 performance was 100,999 against a target of 75,000. This was an improvement on 2016/17, when the figure was 65,461.

The 2014 FD target includes four of the five 'social tariffs/means of assistance'. Customers who benefit from 'Water Collect' are not included in the 2017/18 figure of 100,999. If 'Water Collect' customers were added to the 100,999, the total number of customers benefitting from social tariffs/means of assistance would be 105,864.

The breakdown between the different social tariffs/means of assistance is as follows:

	Total number of customers/schemes
HelpU	57,118
WaterSure Wales*	33,141
Water Direct	11,228
Customer Assistance fund	5,932
Water Collect	8,276
Total	115,695

*Welsh Water Assist and WaterSure Wales have now been combined.

Some customers benefit from more than one affordable tariff/means of assistance which explains why the figure of 105,864 differs from the 115,695 reported in the table above.

PR14 FD – Outcome 6 – We will maintain our assets for future generations, at the most efficient cost.

F1: Asset serviceability

Definition: Serviceability assessment of either stable/marginal/deteriorating as defined within the Ofwat KPI, as set out in IN 13/03.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	Stable	Stable	Stable	Stable	Stable
PR14 BP Target	Stable	Stable	Stable	Stable	Stable
Outturn/Forecast	Stable	Stable	Stable	Stable	Stable

2015/16 Commentary - The suite of indicators have been reviewed for each sub service and our conclusions are as follows:

Water Infrastructure - Stable
Water Non Infrastructure – Stable
Wastewater Infrastructure - Stable
Wastewater Non Infrastructure – Stable

2016/17 Commentary - The suite of indicators have been reviewed for each sub service and our conclusions are as follows:

Water Infrastructure - Stable
Water Non Infrastructure – Stable
Wastewater Infrastructure - Stable
Wastewater Non Infrastructure – Stable

2017/18 Commentary - The suite of indicators have been reviewed for each sub service and our conclusions are as follows:

Water Infrastructure - Stable
Water Non Infrastructure – Stable
Wastewater Infrastructure - Stable
Wastewater Non Infrastructure – Stable

F2: Leakage

Definition: Leakage measured in megalitres/day for the calendar year. Calculation as defined for the Ofwat KPI in IN 13/03.

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	181	177	173	171	169
PR14 BP Target	181	177	173	171	169
Outturn/Forecast	180	175.43	172.85	171	169

2015/16 Commentary - In 2015/16, total leakage was 179.86 Ml/d. This means that we achieved the target set in the 2014 Final Determination which was 181 Ml/d.

2016/17 Commentary - In 2016/17, total leakage was 175.4 Ml/d. This means that we achieved the target set in the 2014 Final Determination which was 177 Ml/d.

2017/18 Commentary - Total Leakage has reduced in line with the AMP6 Business Plan target to deliver performance of 172.85 Ml/d during 2017/18. In line with Business Plan commitments, improvements to date within our Water Balance have been made, specifically in the areas of:

- Meter Under Registration through robust testing of meter performance;
- Household Night Usage with the implementation of “Fast Logging” technology; and
- Operational Use where analysis of water used for water quality purposes have been undertaken.

We have also improved our Data Operability and the percentage of properties monitored in District Metered Areas.

The reduction in leakage was achieved against a landscape of challenging weather conditions, including both increased temperatures over the summer period of 2017 and the severe weather impact of Storm Emma during March 2018.

The performance of 172.85Ml/d was delivered below the 2017/18 target of 173Ml/d and is in line with the achievement of the overall AMP6 Sustained Economic Level of Leakage glide path target reduction.

F3: Asset resilience

Definition: Percentage of critical assets that are resilient against a set of criteria. Critical assets are those where failure would have a major impact on service to customers or on the environment.

Water

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	80%	81%	83%	85%	87%
PR14 BP Target	80%	81%	83%	85%	87%
Outturn/Forecast	*88.2%	89.5%	90.4%	91%	91%

**In 2015/16 we reported a figure of 86.8%. We explained that we had been reporting on the updated list of critical assets, recognising that new and improved data is available to inform the definition of a critical asset. This performance is now restated and based upon the list of critical assets included in our PR14 Business Plan which informed the 2014 Final Determination.*

2015/16 Commentary - Our performance in the year was 86.8% (on latest list of critical assets) and 88.2% (on PR14 list of critical assets). We were ahead of the target for the year which was 80%.

There were a number of changes in the course of the year. As planned, we included critical underground assets, e.g. water mains and, recognising that this is a dynamic process, new assets were added in the course of the year, e.g. Dolbenmaen was a newly constructed Water Treatment Works (WTW).

“Failure resilience”, which relates to flexibility within the network in the event of loss of water supply capacity, was also adjusted so that the ‘Customer Service’ impact is now better reflected for impounding reservoirs.

Investment at the following locations helped increase overall resilience:

- Ponsticill WTW, where a flood resilience scheme was completed; and
- Wentwood Impounding Reservoir, where minor capital investment was prioritised with the power and control systems upgraded.

2016/17 Commentary - Our performance of 89.5% improved in the year and we were ahead of the target for the year which was 81%.

In addition, we monitor and report internally on the updated list of critical assets, recognising that new and improved data is available to inform the definition of a critical asset. By way of illustration, the PR14 Business Plan included 91 assets. The list of critical assets in 2016/17 was 111. The internally reported performance was 87.8% as against 86.8% last year.

2017/18 Commentary - Our performance of 90.4% improved in the year and we were ahead of the target for the year which was 83%.

In addition, we monitor and report internally on the updated list of critical assets, recognising that new and improved data is available to inform the definition of a critical asset. By way of illustration, the PR14 Business Plan included 91 assets. The list of critical assets in 2017/18 was 111. The internally reported performance was 88.7% as against 87.8% last year.

Waste

	Actual performance			Forecast Performance	
	2015/16	2016/17	2017/18	2018/19	2019/20
FD Target	71%	72%	74%	76%	78%
PR14 BP Target	71%	72%	74%	76%	78%
Outturn/Forecast	73.6%	73.6%	77.5%	78%	78%

2015/16 Commentary - The score for resilience of wastewater assets was 73.6% against a target for the year of 71%. With above ground assets there were changes, including;

- At Kinmel Bay Waste Water Treatment Works (WWTW) a SEMD scheme was completed in the year leading to an improvement in the security score for that works; and
- At Parc y Splotts WWTW, Carmarthen the delivery of a phosphorous removal scheme saw an improvement in the treatment resilience score for that works.

2016/17 Commentary - The score for resilience of wastewater assets was 73.6% and ahead of the target for the year of which was 72%.

This performance is based upon the list of critical assets included in our PR14 Business Plan which informed the 2014 Final Determination. In addition we monitored and reported internally on the updated list of critical assets, recognising that new and improved data is available to inform the definition of a critical asset. By way of illustration the PR14 Business Plan included 35 assets. The list of critical assets in 2016/17 was 49. The internally reported performance was 74% as against 73.6% last year.

2017/18 Commentary - The score for resilience of wastewater assets was 77.5% and ahead of the target for the year of which was 74%. We continued to monitor and report internally on the updated list of critical assets, recognising that new and improved data is available to inform the definition of a critical asset. By way of illustration, the PR14 Business Plan included 35 assets. The list of critical assets in 2017/18 was 48. The internally reported performance was 78.3% as against 74% in 2016/17.

3. Commentary on approach to forecasts for 2018-20

All of our forecasts to 2020 are predominately designed to ensure we stretch previous years' performance. Each Director at Executive level is involved with setting the stretching forecasts, which are then reviewed by our Board before final approval is given.

The forecasts are based on the best information available to us, we utilise local knowledge and expertise to produce challenging forecasts and ensure that they represent a stretch for each business unit.

The forecasts we have used are aspirational, our ultimate goal is to outperform against all of our performance commitments.

During February each year, our Board is presented with a paper setting out the aspirational forecasts for the next year. This is an extensive paper setting out for each Measure of Success our performance achieved over the last five years, how our performance compares to other water and sewerage companies plus our PR14 Final Determination targets. In addition, some commentary is included within the Board paper to support the forecasts and reflect the business focussing on longer term planning.

4. Major incidents and statutory and licence obligations

Major incidents

There were 2 major incidents from 2015/16 to 2017/18 relating to pollutions.

- On 28 November 2016 the company investigated a potential pollution incident due to an oil sheen observed in the river. The incident was attended within 1 hour 47 minutes of the initial call. There were some difficulties identifying the source. On 7 December, an escape of heating oil was located at one of our operational sites. This had percolated through the ground in to a surface water drainage line which entered the watercourse. This was turned off immediately, stopping the leak. All remediation work has been undertaken.
- On 18 February 2017 the company investigated a pollution incident due to the over pumping of an excavation when repairing a burst on the water distribution system. Silt netting was installed on the 20 February with further silt mitigation installed on the 21 February. This allowed the repair to continue without further impact to the watercourse. A range of environmental awareness sessions have taken place following this incident in order to prevent reoccurrence.

Further details can be found within appendix E (page 123) of the PR14 reconciliation rulebook, an overview of the category 1 and 2 pollution incidents for 2015 - 2017.

Prosecutions, enforcements undertakings and formal cautions.

Please see PR14 reconciliation rulebook (page 125) for an overview of the prosecutions, enforcement undertakings and formal cautions from the EA/NRW reported in APP31 lines 11-13.

Compliance with DWI statutory and license obligations

For the period 2015 to 2017, we have met all licence obligations.

Compliance with Ofwat regulatory requirements.

For the period 2015/16 to 2017/18 we are fully compliant.

5. Our customer relationship during major incidents or escalated complaints

Storm Emma and the impact to reliability of supply.

The impact of the extreme weather event was felt right across our operating area with emergency command centres operating around the clock between 28 February and 9 March 2018. We experienced very challenging conditions, with a Meteorological Office Red Warning issued on 1 March which led to large volumes of snowfall impacting on much of our operating area. Conditions were so bad that the M4 motorway in South Wales was closed, and many minor roads remained inaccessible a week after the red warning.

In addition to our usual operational resources, under our emergency procedures we mobilised a further 700 colleagues from other parts of the business and our supply chain to support the incident response. Our focus was very much on protecting supplies to our main population centres and this ensured that 99% of connected properties did not experience any issues at all. However, despite the best efforts of our operational teams, four rural communities suffered prolonged supply interruption. In these areas, just over 6,000 properties were affected, with the worst being 341 with a supply loss of just over five days. In some cases, for the shorter supply interruptions, it may have been caused by customers' own frozen supply pipes.

We ensured that these affected customers received a written apology and compensation very promptly starting on 9 March, as conditions improved. We have made approximately 14k payments to Household Customers since the incident. We made the decision to pay £75 fixed compensation by cheque so that even where a customer account is in debit they received compensation for any interruption in supply.

In the four worst affected areas, we also proactively contacted over 150 Business Customers and arranged appropriate compensation.

We issued over 4,000 lagging kits free of charge over this winter period (prior to Storm Emma), as part of our annual 'Wrap up Wales' campaign to help people protect their home plumbing.

Throughout the incident we did all we could to identify vulnerable customers and we utilised a process to prioritise delivery of bottled water to customers in such circumstances. More widely, we sought to get alternative supplies to communities where we had lost supply, however at the height of the storm our efforts were severely hampered by inaccessible road conditions.

Customer communication was a key area of focus during the incident and we also engaged extensively with a wide range of stakeholders. In relation to the four specific rural areas, we have met or spoken with respective Assembly Members and MPs and have received positive feedback in terms of our response and approach to customers from them. We had regular dialogue with Welsh Government officials throughout the incident and this included direct briefing with Ministers.

Our emergency plan was enacted in the week prior to the Red Warning as we took heed of the predicted deterioration in conditions. Following the experience of the Winter 2010 severe weather incident, we have added materially to our emergency resources, for example we have over 200 4x4 vehicles and our own fleet of over 30 water tankers. In 2015, our

Board approved a further £10m investment in additional emergency equipment from our 'Not for Profit Return of Value Customer Dividend' funding. We have an annual winter preparation plan and this was reviewed at Executive level on 21 November 2017 and we carried out a simulation test of related procedures on 14 December 2017. These actions, plus our general emergency procedures formed the basis of our response to Storm Emma.

The severe weather was a significant event across the whole of our operating area and we expended every effort to mitigate the impact on our customers. We are extremely proud of our front line operational and contact centre teams, who worked around the clock to try to maintain or restore services to our customers, and to provide customers with the best available information. We will ensure that the respective lessons learnt are fully taken into account in enhancing our systems and processes to ensure company-wide resilience to deal with future emergency events.

Storm Emma had a significant effect on our reliability of supply (A3 Measure of Success) with our 2017/18 performance at 43.3 minutes, compared to 12.15 minutes in 2016/17. If the severe weather incident had not occurred our performance would have been around 15 customer minutes lost.

In addition, we saw an increase in the volume of unwanted calls from 127,449 in 2016/17 to 138,193 in 2017/18 (some 7%). This was mainly due to the impact of the severe weather in March 2018, with the water business receiving some 13,000 additional unwanted calls during this period.

Escalated complaints

	2015/16	2016/17	2017/18	Total
Total volume of Complaints	7,128	6,582	3,862	17,572
Number of stage 2 (escalated) complaints	425	459	253	1,137
Percentage of stage 2 (escalated) complaints	5.96%	6.97%	6.55%	6.47%

When a customer contacts us our focus is to address the customers issues so that they do not need to contact us a second time. This not only applies when dealing with written complaints, but all customer contacts, our focus is for customers to receive a good service on every contact.

As a result of this focus, during the period 2015/16 to 2017/18 less than 6.5% of the written complaints we responded to escalated to a second stage complaint.

Some of the issues and/or action we've taken to improve are:

- We introduced a new billing system in January 2015, as with all significant system changes this came with new challenges and teething problems. This included some bugs which generated complaints, as well as staff learning

and bedding in of their skills and confidence. The focus on fixing the bugs was based on the customer impact (i.e. those which had an impact on customers were the priority).

- As a company we focus on root cause analysis to identify opportunities for improvement to processes and meeting customers' needs.
- A continued focus on employee engagement – better engaged people will care more and accuracy will improve. As part of this we campaign we extended personal development and delivered soft skills training such as communication, tone of voice and refresher training on the system. This improves customer's relationships with our colleagues as we are better able to engage with them.
- The use of proactive contact methods such as texting has proven to be very effective in managing key messages and keeping customers updated during emergency incidents.
- We have seen far more customers chasing a response within 24hrs or 48hrs of an email. We have implemented an automated email acknowledgement, clearly outlying next actions and timescales. We have invested in additional resources so that we can improve on our response times for complaints. Our aim is to answer most email complaints within 12 hours of receiving them and white mail within three days, thus avoiding repeat complaints from customers who are chasing replies to the previous correspondence.
- Implemented our 'tone of voice' approach to replies, particularly when dealing with an identified vulnerable customer to ensure clarity and understanding.
- In 2017/18 we implemented a follow up process to improve customer engagement. A follow up call is made to the customer three days later to discuss our response and if the customer has any questions/concerns. This has had a positive impact on our escalated complaints.

6. Investment and operating efficiency

Wholesale

Our actual and forecast wholesale expenditure for AMP7 compared to the PR14 Final Determination may be summarised as follows:

Wholesale Totex	2015/16	2016/17	2017/18	2018/19	2019/20	Total
	£m	£m	£m	£m	£m	£m
PR14 Final Determination	**613**	**607**	**596**	**582**	**572**	**2,971**
Re-profiling	(57)	(4)	(1)	42	20	
(Under)/over spends	(59)	6	18	6	(1)	(30)
	498	609	613	630	591	2,940
Additional expenditure	0	16	38	35	38	128
Actual /Forecast	**498**	**625**	**651**	**665**	**629**	**3,068**

2017-18 Prices

Further detail is set out in the supporting document PR14 Reconciliation Rulebook. The principal differences are set out below.

Re-profiling of expenditure

Uncertainties as to detail of the investment programme that was to be delivered by our Capital Alliance partners led to the rescheduling of schemes originally anticipated for delivery in the first two years of the AMP to later years. The scale of this 'Year 1 dip' in investment was much lower than experienced in previous AMPs. Nevertheless, it is an area we are planning to eliminate for AMP7.

(Under)/over spends

Overall, our forecast AMP6 wholesale expenditure is some £30 million below that anticipated in the FD. The principal areas of underspend are:

- Some £25 million was due to our successful challenge of 2005 rates assessment leading to a one-off refund in 2015/16.
- Less remedial work was required for transferred private sewers and pumping stations resulting in some £11 million less expenditure than anticipated, mostly in 2015/16.

Additional expenditure

Welsh Water's primary financial objective in AMP6 was to reduce the level of gearing (the ratio of net debt to Regulatory Capital Value) to 60%. This was achieved early in the AMP6 period and created financial headroom to deliver even more for customers. Following an extensive customer engagement exercise 'Have Your Say 2016' (See the supporting document 1.1 PR19 Customer Engagement Report), stakeholders and the CCG, we used this financial headroom to bring forward future investment in high priority areas for customers.

- A further 9 Zonal Studies in the worst performing water zones, improving water quality and further reductions in supply interruptions (£40 million).
- Increase distribution system storage in Hereford to reduce risk of prolonged water supply outages (£13 million).

- Meet new legal obligations for impounding and service reservoirs and mitigate the risk of a major asset failure (£14 million)
- Reducing the risk of flooding and pollution in west Cardiff and Cardiff Bay with a new pumping station, upgraded power supply, standby generation and flood protection (£21 million).
- 21 energy efficiency projects across a range of technologies to reduce energy costs by some £2 million a year (£18 million)
- Improve our community and recreation offering to customers by rehabilitating the Llanishen and Lisvane reservoirs in Cardiff and opening a new visitor centre. (£8 million).
- Improvements to control systems at treatment works including SCADA, PLCs and telemetry to ensure critical systems are robust and resilient. (£20 million).

Retail

Our actual and forecast retail expenditure for AMP7 compared to the PR14 Final Determination may be summarised as follows:

Retail operating expenditure	2015/16	2016/17	2017/18	2018/19	2019/20	Total
	£m	£m	£m	£m	£m	£m
PR14 Final Determination	**51**	**50**	**48**	**47**	**47**	**243**
Difference	7	5	8	12	8	40
Actual/Forecast	**58**	**55**	**56**	**59**	**55**	**283**

Outturn Prices

The primary cost drivers in retail operations are bad debts (currently 38% of costs) and volumes of customer contacts which drive staff costs (some 48% of costs).

At PR14, Ofwat made some allowance for the impact of deprivation and relative bill levels on the levels of bad debt costs and also the costs incurred in the management of debtors but insufficient to reflect the circumstances of our customer base - our customers are amongst the poorest in England and Wales and Welsh Water's bills are amongst the highest.

Whilst our overall retail cost to serve is one of the highest in the sector, our customer service costs have compared favourably with other companies, averaging £7.24 per customer between 2014 and 2017, compared with the industry average of £7.50 over the same period. We also know from benchmarking visits with companies within sector and other retail and call centre operations that our productivity measures (such as sickness absence, abandonment rate, spans of control, salaries) and use of technology are also comparable. We have consciously targeted higher service levels, such as response times to emails, and have invested in dedicated coaching capabilities, to improve the experience of our customers.

7. Transparency and engagement with customers on past performance

We are committed to making available to customers, information that is reliable and accurate, is easy to understand and navigate and which allows them to understand how we are performing. Providing information to a consistently high standard also helps build trust and confidence in everything we do. Much of the information we produce is provided to our regulatory stakeholders and other stakeholder groups periodically or published in our Annual Performance Report (APR) and on our website.

It is important that we continue to review what information our customers and other stakeholders want and need. We will build on our proportionate and transparent approach to data assurance activities, and ensure that our customers and stakeholders are involved in this process.

We welcome the important contribution made by our independent Customer Challenge Group to (CCG) ensure that we plan to deliver the best possible outcomes for customers. The input of the respective chairs of the CCG and CCWater (Wales) have helped inform the structure and content of our APR and we value the constructive comments received and their general support.

7.1 Annual performance report

In 2017/18 we continued to engage with the Chair of the CCG and met on two occasions. We shared with him our proposals on the assurance activities planned and received a positive and constructive response to the Draft Assurance Plan consultation. In our meeting on the 24 May 2018 we were able to discuss with him the structure of the APR and provide a progress report on our findings at that time.

7.2 Charges schemes

Each year, we are required to publish a number of charges schemes. These schemes set out the company's charges for the services we provide and the terms and conditions of those charges

The effect of these new charges on customers' bills were assessed for a range of different customer types and the impact of the new charges were analysed and reviewed by CCWater.

We consulted with CCWater in a timely and effective manner on our Charges Scheme. CCWater meetings, focusing on charges, took place monthly between August and December 2017.

7.3 Statutory financial reporting

Our Annual Report and Accounts are published on our website in July each year, and our Interim Statements are published in the preceding November.

Formal adoption of the statutory accounts occurred at the Members' Annual General Meeting in July 2018.

7.4 Natural Resources Wales (NRW)

Each year, we are required to submit to NRW, data which is used by them to populate a set of compliance tables around how our Sewerage Treatment Works are performing against their discharge consents.

There is a Liaison Framework in place between ourselves, Environment Agency and NRW. Operational staff from the respective organisations meet locally and strategic staff meet centrally to work on issues such as the National Environment Programme scheme progress, audits and data integrity. Outstanding issues can be escalated upwards through the framework to director level meetings.

Once the end of year compliance position has been agreed, the year-end data is signed off by NRW and our senior managers.

7.5 Customer engagement

We ensure that data and information that is used to inform any customer research is derived from a reliable and accurate source and also that it is processed correctly. We have in place a framework for all customer engagement activities.

Generally customer engagement undertaken for PR19 is shared with the CCG and they have the opportunity to challenge and scrutinise the approach and materials provided. Our research briefs and questionnaires are shared with the CCG as are all final reports on the results.

Following completion of the PR19 research we will undertake a lessons learnt exercise with the CCG, which will include a review of how the controls and mitigations listed above were followed.

7.6 Non-household customer contacts and complaints

Quarterly reports have been provided to CCWater detailing our performance on a number of key measures. This includes the number of unwanted telephone contacts and written complaints. A separate quarterly report is provided for non-household written complaints and includes the top five reasons for written complaints and unwanted telephone calls.

Senior Managers and Directors attend the quarterly CCWater meetings to discuss performance, including performance relating to non-household customers.

We regularly attend quarterly meetings with other companies where the handling of written complaints are discussed. In addition, we attend industry meetings with CCWater and were part of the working group chaired by CCWater to draft guidance for complaints reporting from 2020 onwards.

7.7. Discover Water industry comparison website

Our performance data is included within the Discover Water website, which is a dashboard designed to provide clear and trustworthy information for customers about water companies in England and Wales.

Customers can now quickly and easily see how their water company is performing and compare it to other companies.

The information on Discover Water has a comprehensive range of data covering water quality, public health, customer service and environmental aspects of water and sewerage services.

Water companies and regulators hope Discover Water will encourage customers to talk to their water companies and influence decisions on how their services are run.

A range of organisations are involved in the delivery of Discover Water. These are:

- Water UK
- CCWater
- Defra
- Drinking Water Inspectorate
- Environment Agency
- Natural Resources Wales
- Ofwat
- Welsh Government
- Information provided by UK water companies

8. Lessons learnt and looking ahead to AMP7 performance

We have a long-standing and well established programme to continually identify new ways of working and innovative practices that will deliver improvements in service and cost efficiency.

Within section two (Performance 2015-2018) we have included the additional measures we plan to put in place to ensure we meet our 2020 targets.

More broadly, the key lessons learnt to date during AMP6 and the action we have taken or will take to successfully deliver our 2020-2025 business plan are summarised below.

The importance of long-term planning

The water industry's regulatory cycle is based on five-year plans. We appreciate the reasons why this timescale is used, but it can encourage a short-term outlook and delay the start of service delivery programmes. For example, as set-out in Section 6, our Totex expenditure at the start of AMP6 was lower than planned with some significant investment being delayed to future years. To prevent this recurring:

- We started our customer engagement on service priorities earlier (in 2016) and will move to an on-going engagement programme rather than being price review centric.
- We developed a 30 year vision "Welsh Water 2050" so that we can anticipate and prepare for the challenges and opportunities that lie ahead during the next 10, 15 or 30 years. This will be updated regularly, at least every 5 years.
- Our AMP7 business plan reflects long-term strategies consistent with Welsh Water 2050 e.g. the water network zonal study and reservoir safety programmes extend for 15 years.
- We have provided visibility of the AMP7 programme to our delivery partners so that they can start planning for AMP7 in AMP6.
- We have created a rolling 3 year programme to enable planning and packaging of work based on geography and/or technical specifications to reduce design input, increase supply chain leverage and increase use of standardised products and offsite build.

Synergies from a multiple benefits approach

Historically, there has been a tendency to focus on individual performance commitments separately. Early in AMP6, we trialled a new approach to water network performance, 'Zonal Studies'. Working closely with the DWI we undertook a 'source to tap' review of water quality, hydraulic and customer performance data within an individual water quality zone (of which we have 82). This demonstrated significant benefits (both service and costs) of approaching Water Quality, Reliability and Leakage as a package of outcomes rather than in isolation. Our AMP7 service delivery and expenditure plans have been developed along these lines.

We have recently concluded a 'Water Resilient Community' pilot scheme in the Rhondda Fach area where we are undertaking a major water mains replacement programme – 54 km. The original purpose of the project was to explore ways to work with the community to mitigate the disruption and inconvenience that the programme would cause. It has been a resounding success and shown that there are real opportunities to deliver wider benefits to the community over and above the benefit of the underlying purpose i.e. replacing the main. We have been able to offer members of that community, one of most deprived in Wales, advice and help on affordability (including our social tariffs), promoting our 'Stop the Block' sewer awareness campaign, water efficiency measures, identifying vulnerable customers for priority services and advice on preventing freezing pipes, our 'Wrap Up Wales' programme. Our AMP7 plan will leverage additional benefits from planned major investments and will undertake at least one 'Water Resilient Community' project every year.

Leveraging benefits from the supply chain

Our supply chain includes a number of established multi-national organisations; 'experts' in their fields who can draw on experience of best practices and innovations from across the world both within the water industry and in other areas.

Early in AMP6, we faced new legal obligations following EU Infraction proceedings against the UK Government in relation to storm discharges into the Loughor Estuary. The conventional engineering solution would have cost an estimated £275 million. Through our supply chain partners, we identified pioneering peak flow wastewater treatment technology in the US which complimented our Rainscape approach and will result in a cost of some £75 million.

We are currently renegotiating or retendering many of our supply chain contracts. These will include new arrangements for closer integration between our operations' senior management and supply chain partners to support the implementation of innovative solutions and supplier alignment to our ambitions on performance commitments.

Greater use of data

During AMP6 we have invested (people and systems) in improving our capability to collate, analyse and perhaps more importantly convert data into operational information.

As at 31 March 2018, we had over 89,000 people signed up to our social tariffs and a further 25,000 customers benefitting from payment assistance schemes. We probably hold more information on financially vulnerable customers than any other company in the sector. We have undertaken detailed analyses of this and other information and concluded that the needs of financially vulnerable customers range across a wide spectrum and cannot be adequately dealt with by 'generalist' call centre staff. We are in the process of establishing a specialist affordability team that will work closely with our existing debt and customer teams to ensure that customers are on the appropriate tariff, billing regime and payments methods for their individual circumstances. This also requires changes to our systems to provide greater flexibility to our billing and payment services.

During AMP6, we have invested in and developed an enhanced network monitoring capability. This has produced data indicating a much higher proportion of leakage on customers' pipes and in their homes than previously thought. We have recently trialled innovative 'stopwatch' monitoring on customer supply pipes, which can detect very low

flows that are not registered by conventional meters, including flows arising from leaking taps and toilet bowls. Our calculations suggest that if we can tackle these low flows taking place in a significant proportion of customer properties, we can bring down leakage in a much more cost effective manner than by committing further resource to enhanced 'find and fix' activity on our distribution networks, where we face seriously diminishing returns. We are making plans for 'Project Cartref (Home)' to be launched over the next two years which will involve a shift into new modes of operation to work jointly with customers to identify and stop leaks inside their properties, while continuing with our 'find and fix' approach on the distribution network.

Learning from others

We have conducted a number of benchmarking visits to other organisations to ensure that our direct customer service costs are in line with other sectors. This benchmarking work suggests that there are only limited, incremental opportunities to further improve our productivity in handling customer contacts. We have concluded therefore that, in order to materially reduce the cost of dealing with customer contacts, we will need to target significant reductions in the levels of contacts themselves. During AMP7 we are planning a number of initiatives, enabled by customer segmentation data and new customer contact capabilities, that will help reduce contacts while offering a more personalised service to customers.

We have established a joint project with Veolia Water to investigate ways to use global best practices to optimise chemical and power usage to match raw water conditions and plant capability. Pilot studies at 2 water treatment works have delivered substantial savings. The programme which uses external benchmark data for 2000+ plants across the world, will be extended across the water treatment estate.

Not to forget the basics

During AMP6, we initiated and developed a specific programme (and methodology) to optimise 'day to day' operations -the 'Lean' programme. This is an intensive process and involves detailed examination of processes and procedures at single sites and/or small teams and enables those teams to identify and eliminate inefficient processes and working practices. This has already been deployed in 2 water production areas and the wastewater sludge production areas with great success. This will be rolled-out across the remaining water production areas, wastewater treatment estate and both water and wastewater networks.

Our 'root cause' analyses of water network incidents identified operator valve techniques as a source of supply interruptions and discoloured water. We build a valve training rig facility and a programme of valve training for all water network operators. The training programme has been extended to third party users of our network e.g. the fire service. A similar training programme has been set up for wastewater network operators with a focus on blockages.