
Regulating for the long-term:

Resilient essential
services require
healthy assets

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Summary

Ofwat has set out a strategic objective for the next price review to have a long-term focus. We deliver essential services to our customers through a highly complex and varied asset base, with many of our assets required to operate for a very long time. It is critical that those assets are healthy and can operate effectively. There is growing evidence of increasing risk in the asset base; we have been able to manage these risks to date but sooner or later this will need to be stabilised through additional investment.

Addressing future challenges, such as climate change and service improvement are also likely to require more material replacement of the existing asset base. This document sets out some proposals for how these issues could be tackled in both the next price review and the longer term.

We welcome feedback on our proposals. Please email haveyoursay@nwl.co.uk to share your views.

Key actions for the next price review

1. Ofwat should allow companies to make investment cases (similar to 'enhancement' cases at the last price review) for additional investment in capital maintenance or asset replacement where they consider that they have a clear need for additional investment that cannot be funded from the existing base cost allowances.
2. Companies should be required to show that they are effective in managing their asset base: the new Asset Management Maturity Assessment (AMMA) framework could be used alongside existing external assurance frameworks such as the ISO55001 to provide this assurance.
3. Customers could be protected by clearly defining the outputs or outcomes that companies must deliver; Ofwat's new proposals for 'Price control deliverables' could be used here. Similarly, there may be a case for adjusting cost sharing rates for these new investments to return funding to customers where investments are not delivered.

Key actions for the longer term

1. We support Ofwat's recent proposals to begin work to build a better framework for measuring and assessing asset health. This needs to be taken forward for future price controls and developed alongside the AMMA framework.
 2. Ofwat and the sector should explore the opportunity for an independent party to assess asset health and asset management across the sector, comparable to the role undertaken by the independent rating agencies on financial resilience.
 3. Ofwat should explore in future price reviews potential changes to the cost assessment framework to better reflect differences in asset health across the sector.
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Why do we need healthy and resilient assets?

Water and wastewater companies provide essential services. Without safe, clean water to drink and to wash with, or effective wastewater services, customers could quickly face major public health problems. It is partly for this reason that water companies have legal obligations to provide ‘clean and wholesome water’ and to ‘effectually drain’ the areas we serve. This also drives the legal obligations on our regulator to ensure that we can ‘fulfil our functions’¹.

We provide these services through a vast and complex network of assets. Our pipe network would extend around the globe end-to-end and our assets include complex treatment works, large civil structures such as reservoirs and mechanical and electrical assets among many others.

Water companies also maintain assets with some of the longest lives of any sector on the planet, with some of our assets having an engineering life of more than 100 years. Companies need to both maintain these assets so that they are healthy and also replace them when they reach the end of their useful lives.

Failing to invest and maintain these assets, particularly for critical assets, could mean service failures for customers. For example, if a water treatment works serving a local town failed catastrophically then without either an alternative or emergency supply customers could face a significant interruption to their essential water supply. These failures, if they were to occur, could be catastrophic and could have material impacts on customers. Recent global examples of the failures in New Zealand, for example, provide a pertinent reminder of the risks that could occur if insufficient investment is being made and companies are not maintaining their assets efficiently and effectively.

It is therefore essential that water companies are managing their assets effectively and investing sufficiently to keep them in good working order.

At the same time, we must not forget that customers pay significant sums in their bills to fund the maintenance of those assets. For NWL, we spend around £170m every year on the maintenance of those assets and this equates to £90 per customer or 24% of the bill. It is critical that we ensure that companies are managing these assets responsibly and that investment is being undertaken efficiently.

¹The duties also sit with our regulator, see for example: www.ofwat.gov.uk/about-us/our-duties

Case study: New Zealand's water crisis

In 2016 four people died and 5,000 fell ill after sheep faeces contaminated Havelock North's water supply. This tragic incident resulted in a government enquiry that identified systemic failure among water suppliers to meet the high standards required for the supply of safe drinking water to the public. The inquiry revealed that 20 percent of water supplies were not "demonstrably safe"².

As a result, the 'Three Water Review' was commissioned to investigate how to improve the regulation and supply arrangements of drinking water, wastewater and stormwater (the three waters) to better support New Zealand's prosperity, health, safety and environment. The review identified a growing infrastructure deficit across all three areas as shown in Figure 1.

Figure 1: Estimated enhancement and expenditure growth between 2020 and 2050 required to meet current standards in New Zealand.



Source: Three Water Reform Programme March 2021 Local Government and Iwi/hapū engagement

The required investment in infrastructure amounts to NZ\$2.3bn to NZ\$3.2bn annually or NZ\$70bn to NZ\$96bn over the next 30 years – potentially doubling the required spend relative to the baseline council expenditure of NZ\$1.5bn annually, or NZ\$45bn over the same period.

²Report of the Havelock North drinking water inquiry: stage 2', NZ Department of Internal Affairs, December 2017, p.232, p.244.

Is there a problem?

Does the regulatory framework structurally underfund this investment?

There has been some significant debate about levels of capital maintenance investment and resilience in the water sector in the recent past.

The sector regulator, Ofwat, has historically set the allowed cost that companies can use to maintain their assets through a complex suite of econometric models. At the last price review in 2019 (PR19), these models looked back at the total expenditure 'totex' each of the companies had made over the past 8 years including both capital maintenance expenditure and operating expenditure. They then try to establish an 'efficient' totex allowance for the next five years accounting for differences in factors like the scale of companies and the geographies that they serve. Ofwat has historically set the allowed costs at the level of the top quartile companies i.e. those companies who are most 'efficient' or have spent less totex over the last period.

Under this framework there is a risk that companies cost allowances are insufficient.

This risk is exacerbated where levels of capital maintenance may be quite 'lumpy' over time. So, for example, some of those 'top quartile' companies who are setting the benchmark may have been going through a relatively low period of capital maintenance expenditure or a 'capital maintenance trough' where fewer of their assets needed maintenance or replacement.

These issues were explored in an expert report '**Providing appropriate regulatory funding for capital maintenance activity: Ensuring capital sustainability and service resilience**' in 2019, which noted that³:

"It is less understandable that risk-based analyses of future capital maintenance requirements should seemingly play no part at all in its PR19 assessment of capital maintenance given the apparent variability and cyclical nature of this activity.

The obvious solution to this problem is one that Ofwat, the Competition & Markets Authority (CMA) and other economic regulators have all identified in the past, namely the triangulation of historical cost benchmarking with more grounded asset-based evidence.

In our view, a price review in which the funding levels suggested by econometric models are cross-checked, when necessary, against engineering assessments is likely to produce more rounded and accurate overall funding allowances than a review in which lower quartile historical expenditure is simply rolled forward for another five years.

This was also the CMA's view in the 2015 Bristol Water case, and we note that other regulators also use such information even where (as in Ofgem's case) there is the potential in a multi-company environment for sector-wide benchmarking.

Against this background, we think it advisable for Ofwat to take account of forward looking asset and engineering information as it considers companies' revised business plans in the run-up to draft and final determinations.

This might mean permitting companies to make special cost factor claims under a capital maintenance heading or through instituting a more generic process to enable the necessary cross-checking of econometric projections with company specific information.

The precise process is to our mind less important than that the work is undertaken to provide assurance to customers and government on service sustainability and resilience."

³Providing appropriate regulatory funding for capital maintenance activity: Ensuring capital sustainability and service resilience', Dr Harry Bush CB and John Earwaker, May 2019.

At the last price review Ofwat showed that it was not the case that the companies setting the benchmark were operating in a ‘capital maintenance trough’ but the risk persists in the approach to cost assessment. Indeed, when future investment requirements are likely to be above historical requirements – as we consider is likely to be the case for the water sector – the risk that this approach will lead to underfunding is compounded.

In its redeterminations of the PR19 price controls the Competition and Markets Authority (CMA)⁴ recognised that this backward-looking approach may be increasingly problematic, saying:

‘We acknowledge Anglian’s and Northumbrian’s argument that Ofwat’s cost assessment is backward looking and that potential issues with capital maintenance may be forward looking. This is a complex issue, which, going forward, may become more important. We therefore suggest that Ofwat considers developing indicators to track this issue and to enable it to enhance its analysis with a forward-looking element that will assist in triangulating results from its econometric modelling of historic costs⁵.’

In Ofwat’s consultation ‘**Assessing base costs at PR24**’, December 2021, Ofwat explored how a forward-looking element could be incorporated into the setting of base cost allowances for the 2024 price review (PR24). They noted:

‘We are also open but cautious about the possibility of including business plan forecasts into our econometric wholesale base cost models if there is strong evidence to suggest that the historical period is not a good reflection of the future.’

We welcome the opportunity to work with Ofwat to ensure that the approach to base cost modelling is effective and allows for efficient costs. However, Ofwat also consider there is limited evidence to demonstrate why the future is different from the past. We do not consider this is the case, and we explore why future costs may be higher later on in this note.



⁴CMA: Ofwat Price Determinations ⁵‘Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations – Final Report’, CMA, 17 March 2021, paragraph 4.293



What is the efficient level of investment and how can we identify it?

One way of answering the question around the right level of funding is to undertake a systematic assessment of the assets held in different 'classes' or 'types' against an engineering view of asset lives and the required replacement rates, and comparing this against the levels of historical investment in those asset classes.

Effectively this constitutes a bottom-up assessment of the level of investment we might consider as a baseline should be spent replacing assets as they move beyond their asset lives versus what companies are currently spending. This approach benefits from a detailed assessment of the asset base against the age of that asset base and so provides some rigour as to the efficient level of investment using asset age, which is likely to be one key driver of failure. Asset age is just one factor in providing an indicator of asset health - it is not necessarily the same as condition. To be most effective, this approach should also consider the condition and criticality of the assets.

There may also be other drivers of asset replacement or failure, or opportunities to extend asset lives and some assets might be used at different capacities as growth and demand vary across company regions over time.

This was broadly the approach taken by the Water Industry Commission for Scotland (WICS) in its recent Strategic Review of Charges SR21. Under that approach WICS have taken the view in their final determination that Scottish Water, which is a water company operating in a similar environment to companies in England and Wales, has been underinvesting in the replacement of its assets in the past and delivered a substantial uplift in allowed costs for asset replacement. The allowances are subject to stringent controls to ensure that the company does invest in the maintenance of those assets and WICS monitors this investment carefully.

The methodology applied in Scotland looked at the replacement cost of an asset class and divided this by its life expectancy to give long term asset replacement rates. We have sought to replicate the Scottish approach for our business. We applied the initial WICS methodology using readily available data with the results summarised in Figure 2. This work is imperfect but the initial analysis suggests the long-term replacement rate could be between £174m and £237m per year. Long life assets, such as dams and impounding reservoirs were excluded in line with the Scottish Water methodology as these were assumed to be repaired in perpetuity.

Figure 2: Results from initial application of WICS methodology.

	Value	Life expectancy (years)		Replacement rate (£m / year)		Current annual spend
	£m	Low	High	Low	High	£m/year
Water services						
Water resources	1,361	81	108	12.6	16.8	10
Raw water distribution	1,113	88	118	9	13	1
Water treatment	1,392	52	71	20	27	30
Treated water distribution	6,871	65	92	75	106	63
Waste water services						
Sewage collection	11,921	60	86	138	198	32
Sewage treatment	2,349	43	51	46	55	27
Sludge treatment	502	66	94	5.3	7.6	8
Subtotal	25,509	60	83	305.7	422.1	170
Total (excl. long life assets)	13,249	56	76	173.9	236.6	65

Source: NWL analysis as part of WICS Methodology working group

We compared this analysis to our historical investment in replacement rates over the last 10 years. This indicated historical replacement rates in the order of £65m per year (excluding long life assets). This is around a third of the long-term requirements identified above. Including long-life assets, our spend (£170m) is around half of the long term requirements. This finding is very similar to the analysis undertaken by Scottish Water that supported their uplift in funding in SR21. This provides a strong indication that current levels of spend are not sustainable in the long-run and that investment levels will need to increase to maintain service levels in the future.

Have historical allowances been set at the right level?

Since the allowed maintenance costs are set on a backward-looking basis there remains a risk that the allowances might not have been set at the appropriate level. Even though the water sector in England and Wales has been regulated for nearly 35 years, we might have structurally been under-investing for that full period storing up issues for the future that we still do not see because the asset lives are so long that major structural failures have not yet occurred.

Under the 'RPI-X' regulatory framework companies also have incentives to find innovative and more efficient ways of doing things, reducing the amount of totex that they need below the allowances that have been set. Where they do this they have traditionally retained about half of that outperformance for the shareholder with half of it going back to that company's customers. At the next price review this approach has then allowed a tougher efficiency benchmark to be set therefore allowing all customers to benefit from that efficiency further.

However, where companies have underspent their allowances for capital maintenance in the past, if they are now arguing that they need further investment for asset health there is a question about why they did not spend the allowances when they had them. We note that the sector has generally not underspent allowances and in the last price control period the sector overspent against their business plan capital maintenance forecasts by 9%.

Figure 3: 2015-20 plan versus actual

2015-20 Business Plan v Actual £ million 17/18 prices		
Capital maintenance		
	NWL	Industry
Business plan	887	15,861
Actual	875	17,244
Variance	(1)%	+9%

Source: NWL Analysis. Note – the Final Determination allowances for capital maintenance were part of an aggregate totex allowance.

Are companies just managing their assets badly?

Assets, particularly those with long-lives, are unlikely to breakdown completely and suddenly, especially where they are part of a wider system. Indeed, we would expect there to be early warning signs or indicators of future risk. Some of these indicators might be signs that assets are likely to fail in the future – these are known as leading indicators. Others might be indicators of the level of failure currently taking place – lagging indicators. We would expect well managed and responsible companies to be monitoring their assets effectively through a suite of these indicators and assessing the health of those assets to identify and prioritise investment appropriately. There is currently no commonly established system across the water sector for measuring and assessing asset health and this is done inconsistently across companies – this is an obvious and considerable gap across the sector and makes it difficult to know whether companies are managing their assets effectively.

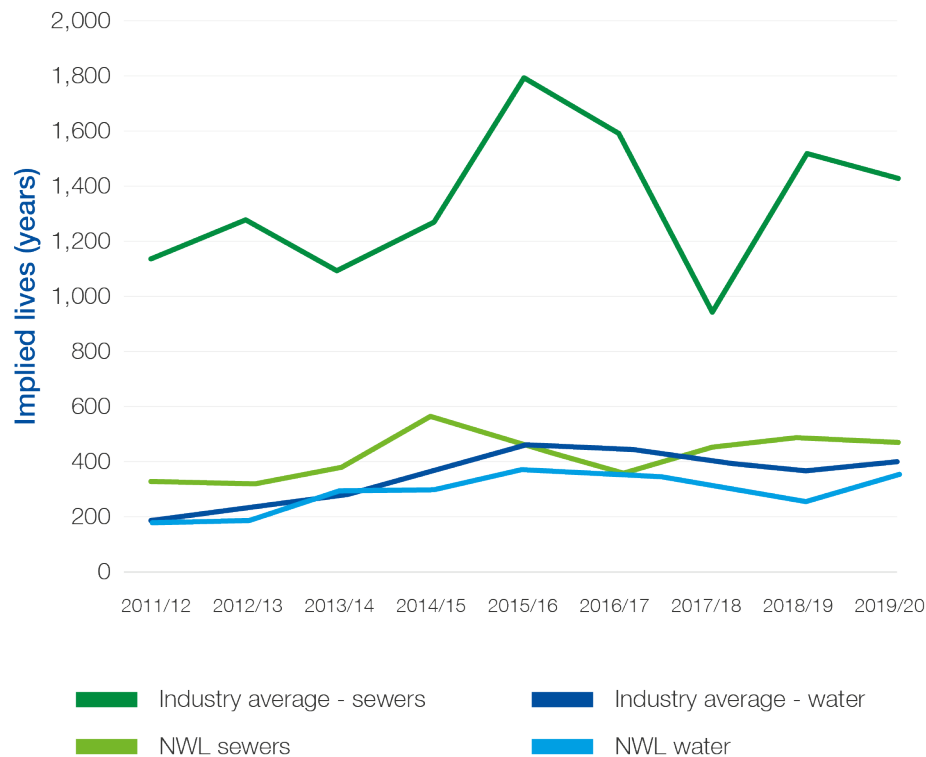
However, there are certain leading and lagging indicators that can be established – these often point in opposite directions, highlighting the complexity of understanding whether or not there is a genuine problem to resolve. For instance, implied asset replacement rates suggest that we are expecting on average sewers to last for well over a 1,000 years.

However, lagging indicators like the amount of burst water mains we experience or the number of collapsed sewers is actually falling over time - suggesting that things are perhaps getting better.

It is helpful to consider the approaches employed in other sectors, such as the Network Asset Risk Metric (NARM) approach used in the energy sector to monetise risk⁶. A NARM equivalent may not be the right solution for the water sector, but it does demonstrate that a consistent approach to measuring asset risk management and mitigation across organisations and asset classes is possible. This is important to really know whether the right decisions are being made.

⁶Source: 'RIIO-2 Sector Specific Methodology – Core document', Ofgem, May 2019, p.29-37.

Figure 4: Some leading indicators point to an asset health problem: NWL versus water industry average implied asset lives (last 10 years)



Source: NWL analysis of audited company APR and JR data

Figure 5: Some lagging indicators suggest asset health is improving: NWL's performance on key industry asset health indicators

Asset Health Metric	Change 2010-20
Water	
Discoloured water complaints	-53%
Mains repairs/bursts	-40%
Low pressure	-19%
Wastewater	
Sewer collapses	-45%
Pollutions	-38%

Source: NWL analysis of audited company APR and JR data

The absence of a strong framework for assessing asset health across the sector has also been recognised by Ofwat in their recent discussion paper on operational resilience. This sets out proposals for a phased plan to develop this framework and its associated metrics throughout AMP 7 and into AMP 8.

⁷Source: Operational resilience discussion paper', Ofwat, April 2022.

Is the past a good guide to the future?

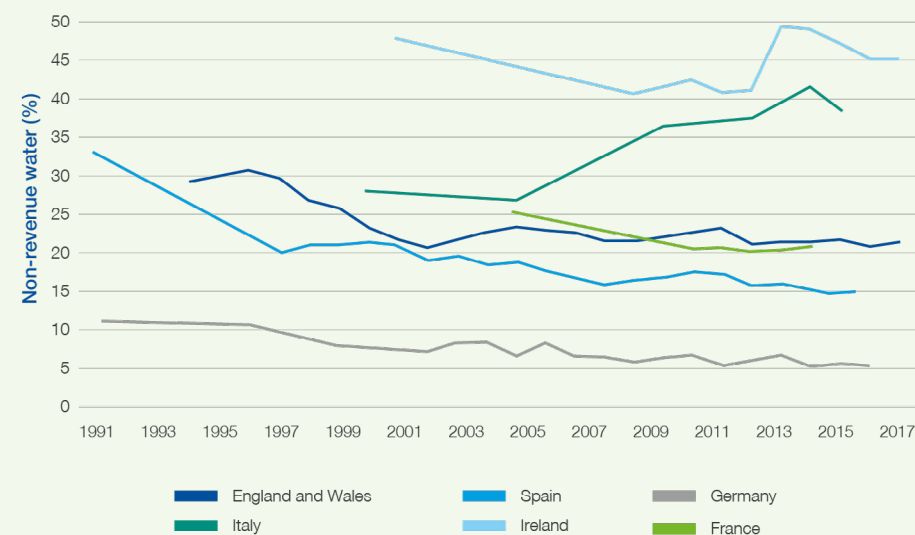
Finally, even if allowances have been set at the right level from the past and companies are managing their assets effectively and investing efficiently, then it is still possible that the future could be different from the past, driving a structural change in the investment needs. There are a number of significant examples here that could drive a need for material change even if the previous issues are not occurring, for example:

- The move to Net Zero – the sector is a major contributor to climate change and has set ambitious targets to reduce emissions and reach ‘Net Zero’ on operation emissions by 2030⁸. Ofwat and the Government also support the reduction of greenhouse gas emissions in the near term. To achieve Net Zero there is an expectation that companies will need to fundamentally reform their asset base, replacing power and chemical intensive treatment technologies with more blue-green infrastructure⁹.

- Achieving stretching service performance targets and maintaining the security of supplies – the sector has similarly set itself some ambitious targets to improve service. For example the sector is seeking to triple the rate of leakage reduction by 2030¹⁰, halve leakage by 2050¹¹ and reduce Per Capital Consumption to 110lpd. Reaching these service targets may require a structural change to the replacement or maintenance of assets. For example, a Global Water Intelligence (GWI) market study in 2018¹² examined leakage levels around the world and noted that reducing leakage to the ambitious levels seen in some other countries would likely require a material increase in the replacement rates of underground mains to match the asset lives of those locations.

Impact of stretching service improvements on asset maintenance and replacement - leakage

Figure 6: Non-revenue water comparisons across Europe



Source: 'International Comparisons of Water Sector Performance', GWI, 2018, p.14.

The study looked at the percentage of non-revenue water compared to total distribution input (Figure 6). The England and Wales data is believed to include supply pipe leakage (as this is usual practice) and hence this is not a true comparator. That said England and Wales are similar to France, with Ireland being significantly higher and Germany being at 5%. According to the European Environmental Agency, Germany's low non-revenue water is due to a combination of favourable soil conditions, treatment to reduce the aggressiveness of supplied water, easy access to repair mains and a high level of mains replacement – with totex per capita (over water and wastewater) being 50% – 75% higher than for England and Wales¹³.

⁸NWL has set itself an even more ambitious target of achieving Net Zero by 2027. ⁹See: 'Net Zero 2030 Routemap', Water UK, 2020. ¹⁰'Public Interest Commitment' Water UK, April 2019, p.3.

¹¹'Preparing for a drier future: England's water infrastructure needs', the NIC, April 2018, p.13. ¹²'International Comparisons of Water Sector Performance', GWI, 2018. ¹³'International Comparisons of Water Sector Performance', GWI, 2018 – totex comparison over available years 2008 - 2016.

What do customers think?

There is some evidence that an issue as long-term and technical as this is not one that customers are necessarily going to be sufficiently informed about to have a clear view on¹⁴ but similarly if water and wastewater services were to be provided in a competitive market (which is what regulation seeks to mimic) then customers would have a choice over the bills that they pay. So it may be useful to ask customers for their views in this area and what they would be prepared to pay for versus what risks they would be comfortable bearing. As part of our work preparing the PR19 business plan we asked customers, in the context of a significant overall drop in their bills, whether they would support additional investment to increase the resilience of the services they receive.

Consistently, customers told us that they would happily forgo any reduction in their bills if the resilience of the service was improved- the risk of service failure was of much greater marginal value than a reduction in the bill. However, we note that the context is now very different and the next price review will likely take place in the context of one of the biggest cost of living crises of our lives¹⁵.

Resilience, asset health and long-term affordability

In 2018, we commissioned DJS Research to carry out qualitative engagement to understand customers' views on resilience, asset health and long-term affordability. Customers were asked whether NWL should take a reactive, mid-ground or proactive approach to asset health.

These were described as:

- **Reactive** - NWL only fixes its assets if something goes wrong. This can lead to fluctuating water and sewerage bills and variable service for customers in the future.
- **Mid-ground** - NWL aims to maintain the condition of its assets, providing stable performance. This leads to relatively stable customer bills and stable service.
- **Proactive** - NWL aims to improve the condition of its assets. This can lead to higher customers' bills and potentially higher standards of service in the short-term and potentially in the long-term.

Not a single customer felt it would be ok for a water company to be 'reactive'. They expected a mid-ground to proactive investment position to be adopted. Reinforcing the preference for a 'mid-ground to proactive' approach is the fact the NWL is seen to be providing an essential service and so to adopt a reactive investment position just was not deemed acceptable.

Discretionary projects

In March 2018, we commissioned Explain Market Research to carry out customer engagement to understand customers' support for various resilience schemes. Complex and lengthy information, including costs and the impact on bills, was conveyed to customers before they voted whether to accept schemes. Customers were asked their views about seven different groups of resilience investments that would reduce risk of service failure and presented with bill impacts ranging from £0.03- £3.63 per annum on their bills- on average 92% of customers supported these investments (in a falling bill environment) with the lowest level of support at 84%.

¹⁴Research by CCW and Blue Marble has found that one of the least appropriate areas for consumer research relates to inputs relating to 'very long-term planning and future scenarios'. CCW, Blue Marble, 'Engaging water customers for better consumer and business outcomes', April 2020, p.5.

¹⁵See for example: www.bbc.co.uk/news/business-60649217

So what's the solution?

There seems to us to be reasonable evidence that we may be structurally under-investing in the maintenance of our asset base – the implied asset lives and the experience from Scotland both point to this. At the same time the current approach is backward looking and the CMA certainly felt sufficiently concerned about this to encourage Ofwat to investigate further.

Moreover, the consequences for customers of underinvestment could be very severe and customers themselves, albeit in a different context have supported investment to maintain resilience in the past.

However, we also recognise that one could also argue that the problem does not exist at an industry level – the service metrics that we have at an industry level actually show a long trend of improving asset health and to the extent that there is an issue perhaps companies could be doing more or managing their assets better within the allowances that they have.

At the same time there is a clear need to understand the issues and challenges better and consistently at a sector level through a common framework for assessing and independently verifying levels of asset health. Until this framework is in place and information is available consistently and robustly it will be difficult to reveal the existence and extent of the problem. This requires a long-term approach across multiple price controls.

We therefore wholeheartedly support the recent proposals in Ofwat's discussion document on operational resilience, which proposes a long-term plan to develop and establish a framework for consistently assessing and reporting asset health across the sector. We also note the interesting paper by United Utilities '[Asset Health in the Water Sector: A framework proposal](#)'. This also seeks to set a framework that simplifies the metrics into areas that are easier for customers to understand¹⁶.

In the long-term for 2030 and beyond

Ultimately this is a long-term challenge requiring a long-term solution.

Addressing this will require:

- The development of common frameworks for assessing asset management maturity and asset health;
- A new approach to assessing efficient cost allowances, probably for PR29; and
- Strong protections for customers to ensure that they receive the full benefits of any additional investment and that water charges remain affordable for the long term.

¹⁶See: <https://www.ofwat.gov.uk/wp-content/uploads/2021/04/United-Utilities-Asset-Health-Framework-Future-Ideas-Lab.pdf>

One of the biggest challenges is the absence of a common approach to measuring asset health and resilience. Ofwat has already taken a big step forward in this area through the development of its 'Asset Management Maturity Assessment' (AMMA)¹⁷, which for the first time provides a common and consistent framework for assessing the maturity of companies' asset management approaches. However, whilst this framework, applied consistently and assured robustly, can tell us something useful about how good companies are at managing their assets, it cannot tell us anything about the health of those assets. The current asset health metrics are recognised by all, including Ofwat in its recent operational resilience discussion document, as partial and weak and whilst work is underway to develop a more comprehensive and effective set of common metrics to allow comparison¹⁸, benchmarking these is not yet possible and the complexity of the challenge will take significant time to consider and address.

Developing common definitions for service performance metrics such as supply interruptions and pollution events has taken significant time to develop and consistently apply across the sector.

Without this common framework companies cannot be assessed on a consistent basis and this makes it difficult to understand the extent to which there is a structural investment problem versus an issue of inefficiency or some other factor. Information asymmetry between the regulator and the regulated monopoly companies is a common historical area of concern. In a highly detailed and technical area like asset health, this issue may be a particularly pertinent concern. This suggests some role for independent assurance of companies' asset health information.

Parallels can be drawn between the need for confidence around companies' asset health and their financial health.

Companies already have requirements to maintain an investment grade credit rating from independent rating agencies¹⁹ as part of the need to maintain financial resilience. These agencies are experts in financial resilience and provide a strong independent check upon which Ofwat and other financial markets rely for confidence.

Some companies already receive independent assurance in relation to their asset management approaches, for example, NWL was one of the first companies in the sector to achieve the International Standards Organisation ISO 55001 accreditation. There may be opportunities to enhance this. Arguably the issue of asset health is as important as the issue of financial health and it may be beneficial to create an independent assessor of the health of companies asset bases. This type of assessment is already undertaken in some other locations and a similar role could be undertaken by the National Infrastructure Commission or some other body.

Case study: US independent American Society of Civil Engineers²⁰

Since 1998 the American Society of Civil Engineers (ASCE) has issued the Report Card for the United States of America's Infrastructure and beginning in 2001, the Report Card has been released every four years.

Using a simple A to F school report card format, the 2021 Report Card for America's Infrastructure examines current infrastructure conditions and needs, assigns grades, and makes recommendations for how to improve in 17 categories of infrastructure.

Perhaps the National Infrastructure Commission (NIC) or a further independent organisation could be established to perform an equivalent or possibly more detailed assessment for the water sector – and other infrastructure sectors – in the UK. This would help to establish consistent approaches to asset health that companies could adopt, and regulators could use. This would likely be something the water companies and our regulators may find helpful.

¹⁷See 'Asset management maturity assessment – insights and recommendations', Ofwat, October 2021.

¹⁸See 'Conclusions on strengthening the regulatory ring-fencing framework'. Ofwat, July 2019.

¹⁹See <https://ukwir.org/asset-health-indicators-forward-looking-metrics-call-for-expression-of-interest>

²⁰See Water Infrastructure | ASCE's 2021 Infrastructure Report Card for more information.

A new approach to assessing efficient costs

Ultimately Ofwat will require a framework that allows it to set an efficient cost allowance for companies and to challenge those that are either poor asset managers or inefficient in spending their allowances to improve on behalf of customers. This is important to ensure that customer bills remain affordable. This implies a new approach to cost assessment.

In its most recent consultation for PR24 Ofwat has sought information on the extent to which it could include forward looking information in the context of its cost assessment approach, but this is set within a consultation that appears reluctant to reform, recognising that the existing framework was broadly supported by the CMA in the recent water redeterminations.

At the same time, without the common framework in place and in the absence of any time series data for asset health indicators, Ofwat is simply not able to consider an approach that would allow it to benchmark efficient costs in the context of asset health.

In parallel with the development of a common framework and in line with development of cost assessment for the 2029 Price Review (PR29) Ofwat could better examine the potential for new approaches to assessing base costs.

This would require innovation in both the measurement of asset health and also the cost assessment framework to support incentives for efficiency.

Strong protections for customers

It is essential that customers are protected both from underinvestment in asset maintenance and replacement and the perils this can bring as well as any inefficiency on the part of companies. There are various existing regulatory mechanisms that will need to be considered, for example:

- **How can Ofwat ensure that companies deliver the required investments to maintain and replace their investments?** In this context there may be a role for Price Control Deliverables, as employed by Ofgem in RIIO-2²¹ and discussed by Ofwat,²² or indeed some mechanisms to 'claw back' expenditure if companies fail to deliver the required activities. This will likely depend on the extent to which Ofwat is comfortable that any new approach to cost assessment adequately captures asset health or not. There also may be some asset classes that lend themselves more easily to an output-based measure of delivery, for example the replacement of a unit of pipe network.

In the regulation of gas networks, the Gas Distribution Network operators are given an allowed cost for each kilometre of network that is replaced based on an efficient unit rate. This ensures that where they underspend but deliver the required network length this is genuine efficiency and can be shared under the usual symmetrical cost sharing arrangements. This provides strong incentives for efficiency, but also ensures customers get what they paid for²³. A similar approach could, for example, be applied to water network replacement. But other asset groups such as treatment works or electrical and mechanical assets may be more difficult to develop output measures for. A really good asset risk metric simplifies the regulatory process, by enabling risk trade-offs in-period (based on risk-based output measures, rather than input measures of asset interventions) and opening up the opportunity to have automatic (or at least faster) cost adjustment claims that are more transparent.

²¹'RIIO-2 Sector Specific Methodology Decision', Ofgem, May 2019, p.17-21.

²²PR24 and beyond: Performance commitments for future price reviews', Ofwat, November 2021, p.5, 8-9.

²³As an example of how this has been implemented in the energy sector, see the description of the Network Asset Risk Metric (NARM) in 'RIIO-2 Sector Specific methodology Decision – Gas Transmission', Ofgem, May 2019, p.71-86.

- **How can Ofwat protect customers from inefficiency in underspending?** Under the current regulatory framework companies are subject to cost sharing incentives. These incentives encourage companies to find efficiencies that can then be shared with customers. If Ofwat were concerned that the outputs from any additional investment could not be adequately captured then Ofwat could consider setting more asymmetric cost sharing rates, in extremis Ofwat could consider a 100% cost sharing rate that returned to customers any monies not spent.

This would result in a significant chilling effect on incentives for efficiency but would ensure that companies spent their full allowances or that they were returned to customers.

- **How can Ofwat ensure that bills remain affordable?** Capital maintenance and replacement expenditure currently accounts for around a third of customer bills. If additional investment is to be granted then we will need to be confident that customer bills remain affordable. This will require a particular focus on customers who are struggling to pay their bills. Currently work is being undertaken by the UK government to introduce a national social tariff which would seek to ensure that water bills remained below 5% of all customers incomes through cross-subsidy. This has the potential to significantly reduce the affordability challenge for customers. Companies will need to continue to bear down on bills and seek other ways of managing affordability - at NWL we have a very ambitious target to eradicate water poverty by 2027²⁴. We are currently experiencing a period of significant affordability pressures which might also support a slower implementation in time for PR29.

In the near term – the next price review

In the absence of the elements described above PR24 offers more modest opportunities to explore the problem and pilot new methods. Without a robust framework for benchmarking asset health and efficient costs Ofwat will rightly want to set a high evidence bar for additional investment. At the same time base allowances under the current cost assessment approach will not take any account of asset health, they will simply consider what companies have spent in the past. Ofwat has consulted on the inclusion of forward-looking estimates in business plans but this is not likely to be successful in the absence of a common framework. Companies may not know what the 'right' level of investment is and different companies will be in different places in the absence of a common framework for assessment.

Instead, for PR24 Ofwat should use the framework for 'enhancement' or 'cost adjustment claims' that it currently has from the previous price review. Ofwat should set an expectation that there could be a need for enhancement investment to improve asset health.

Companies should be required to set out:

- **The need for the investment** – by demonstrating that certain asset classes/groups were at particular risk of failure in AMP 8 or in need of replacement as part of a deliverable long-term asset management strategy and that, if they fail, the impacts on customers could be significant. They would also need to show that base allowances were insufficient in aggregate to address these risks. The requirement should be to show which particular assets are at risk of failure and the consequences of that failure for customers.
- **The options to address these risks** – companies should show through an options appraisal that a range of options for how the additional maintenance/replacement investment would be deployed have been considered and why the preferred options are the most efficient and effective solutions.

²⁴Water poverty is defined as where a household spends more than 3% of its disposable income on water and sewerage services. See Eradicating water poverty by 2030 (nwg.co.uk) for further information.

- **Best value cost benefit analysis** – companies would need to demonstrate that they had completed cost benefit analysis to ensure that their preferred solutions delivered the best value to customers taking account of wider environmental outcomes and public value.
- **Efficient costs** – companies would need to show through benchmarking and independent assurance or market testing that the costs proposed were efficient. Companies would need to consider opportunities for innovation to drive improvements at lower costs to customers.
- **Customer protection** – companies would need to propose a Price Control Deliverable or some other mechanism that would allow funds to be clawed back for customers if investment is not made or outcomes are not delivered. They could also consider whether they wish to propose different cost sharing rates for these investments.
- **Customer support** – companies would need to engage with customers in an informed and deliberative way to ensure that there was support for the investments proposed. Even if this were challenging this must be the right thing to do.
- **Independent and board-level assurance** – companies would need to provide assurance in relation to the business plan including from their boards and independently.

This approach would allow Ofwat to explore the evidence base of structural underfunding or asset health risks and customer support for additional investment as well as pilot new approaches during PR24 ahead of PR29.

Conclusions

There is already a significant evidence base of asset health risk increasing in the water sector.

Indeed, we are aware that the National Infrastructure Commission is reviewing these arrangements for precisely this reason. At the same time the challenges of the future make it highly likely that different investment levels will be required to maintain and replace existing assets. Developing a consistent framework for assessing and reflecting these costs in price control allowances will take time and we will not reasonably be in the right place to do this for PR24.

However, by taking steps now to develop consistent assessment frameworks and piloting approaches in PR24 through the ‘enhancement’ or ‘cost adjustment claim’ process we can make best progress in the near term whilst also improving understanding and evidence for the future.

This could be supported by the development of independent assurance of companies’ asset health outside of the price review and Ofwat, potentially by the National Infrastructure Commission or some other independent organisation. Figure 8 builds on the actions identified in Ofwat’s ‘**Operational resilience discussion paper**’, April 2022, (Figure 0.2) to present our proposed long-term plan; those elements we consider go beyond Ofwat’s view are in bold. We consider that the development of robust metrics will take time, and so our plan sees these being delivered by 2025.

To-date there is evidence of increased asset risk, so far, but which sooner or later has to be stabilised through additional investment. We consider that there is significant opportunity from both innovation and also collaboration to help address those issues going forward.

Figure 7: Potential future plan for understanding and addressing asset health issues

2020-25	2025-30	2030-35
Ofwat and companies take steps to establish a comprehensive and complete framework for assessing asset health and develop consistency in reporting of asset resilience, system resilience and service performance measures.	Through iteration, refine and improve the framework for assessing asset health across the sector to ensure it matures and consistency increases.	Mature frameworks are in place for assessing asset health and allowing efficient costs.
Companies can demonstrate their asset management capability and practice by conducting assessments against the AMMA framework established by Ofwat, with independent assurance of their progress, such as through ISO or other accreditation.	Gain further insight by developing new measures and / or integrating measures and capability monitoring. Early steps can be taken to explore an independent, expert body that could undertake an assessment of each company’s asset health.	Independent expert body established providing assessment of companies’ asset health capability and practice.
For PR24 companies can seek cost adjustment claims/ enhancement cases where they can provide evidence of a need to increase investment to address asset health issues. These can be assessed by Ofwat and suitable protections put in place to protect customers.	With some time-series information available on a consistent basis Ofwat can begin to explore alternative approaches to setting capital maintenance funding. Ofwat can also learn from the PR24 experience around what does and does not work. A new cost assessment approach that reflects the challenges around asset health and capital maintenance / replacement investment can be put in place and trialled.	Independent assessment is in place giving Ofwat confidence that companies are managing their asset bases efficiently and effectively.

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