



Thames Water Response to Ofwat's PR19 Draft Determination

TW-DD-001

August 2019



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Foreword

As a responsible company with long-term shareholders, operating in a monopoly sector, we recognise we have a special duty to our customers and the environment. We welcome objective, well-balanced and challenging regulation, as being key to building public trust and confidence in what we do - and to ensuring long term resilience. Therefore, it is with regret that the Board of Thames Water Utilities Limited has concluded that it could not accept a final PR19 determination based on Ofwat's Draft Determination (DD). This outcome would inevitably lead to overspending and penalties, which, together with substantially reduced returns, would render the business unfinanceable. In turn, this would have serious adverse consequences for our customers and the environment.



For a price control determination to drive the best outcomes for customers, it needs to comprise a tough, yet achievable blend of service targets, efficiency measures and delivery risk. Ofwat's DD, by contrast, contains unreasonably stretching service targets (e.g. the requirement to reduce supply interruptions by 72% in five years) and unreasonably demanding cost reduction targets (i.e. cutting total expenditure in 2020 to 2025 by around £800m or 8% compared with Thames Water's expenditure in the period 2015 to 2020) and insufficient recognition of the costs associated with population growth. These combined challenges would amount to a requirement to improve productivity by at least 30% over five years. This is simply not achievable or realistic. To accept such a determination would prejudice Thames Water's ability to manage the day to day running of the business, let alone the investment needed to improve the long term resilience of the Thames Valley and London's water and wastewater infrastructure.

We fully recognise the importance of keeping bills affordable for the essential service that we provide – our bills have remained flat in real terms for nearly a decade. We have also doubled the number of customers on our social tariff in the past year; and we are committed to introducing discounts of up to 75% for our lowest income customers from next April.

Our April Business Plan responded to the challenge from Ofwat, as well as from customers and stakeholders, taking additional challenge to costs and PCs: specifically, through a further £400m efficiency in base costs and a further £157m efficiency in enhancement costs, while delivering better performance in key areas through innovative solutions. As a result, the April Submission delivered a 22.5% reduction in average unit base opex per customer. We have already started to deliver these cost reductions.

Nonetheless, we can see from an analysis of the DD the very high priority that Ofwat attaches to cutting costs and prices. Accordingly, in an attempt to resolve the current difference between Ofwat's and Thames' position, we have developed a '*lower cost, lower investment*' business plan scenario. This scenario is based on our April 2019 plan, but adapted to minimise expenditure (and bills).

In summary, in this *lower cost, lower investment* scenario Thames Water would:

- **Reduce bills:** Offer an average bill reduction of 3.2% by 2024/25;
- **Lower costs:** Substantially reduce investment, leading to reduced total AMP7 expenditure of £10bn. This broadly matches Ofwat's base totex levels for water, wastewater and retail;
- **Strengthen performance targets for:**
 - Supply interruptions – a reduction of around 40% by 2024/25;
 - Mains bursts – a reduction of around 20% by 2024/25;
 - Per capita consumption – a reduction to 133 litres per day by 2024/25;
 - Internal sewer flooding – a reduction of 30% by 2024/25; and
 - Blockages – a reduction of 20% by 2024/25;



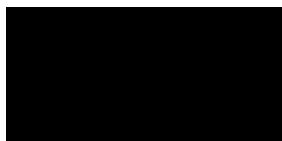
- **Retain already stretching performance targets for:**
 - Leakage – a reduction of 20% by 2024/25; and
 - Pollutions – a reduction of 30% by 2024/25;
- **Rationalise bespoke performance targets:** In light of the reduced totex and to focus on the stretching PCs prioritised by Ofwat, under this '*lower cost, lower investment*' scenario we would streamline the bespoke performance commitments;
- **Accept a challenging, yet achievable productivity shift:** This scenario implies a 17% productivity shift from 2019/20 across the 5 years of AMP7, maintaining an annual 4% improvement rate for each year, compounded; and
- **Receive a fair return:** Apply an allowed return of 2.6% (at the appointee level) based on the lower end of the range for the cost of capital based on analysis from Frontier Economics.

While the business plan scenario is financeable, we anticipate significant performance penalties within the business plan scenario, as we challenge our operation to meet the additional stretch in our performance commitments.

Such a scenario would enable Thames Water to fulfil its statutory and regulatory obligations during the period 2020 to 2025; therefore, it is a scenario that the Board of Thames Water would be able to accept. However, it would not allow Thames Water to begin to address the substantial challenges it faces to renew the infrastructure used to serve the needs of water and wastewater customers in London and the South East and to strengthen operational resilience. For example, under this scenario, Thames Water would defer expenditure on new water treatment works in North East London, defer necessary capacity expansion of major sewage treatment work for expected population growth, defer important work to improve the resilience of the ageing infrastructure and tackling the key future challenges, such as the effects of climate change and water purity impacts from plastics and antibiotics. Therefore, it would amount to a missed opportunity to meet the express preferences of Government¹, environmental stakeholders² and – most importantly – paying customers³ to invest to improve the long term resilience and performance of the operation.

We remain willing to engage fully with Ofwat to explore what could account for the difference between the DD and our plans. We believe that the DD is not consistent with the aspiration of stewardship for the future promoted in Ofwat's Emerging Strategy, which we strongly support. Therefore, we hope that Ofwat will use the remaining months before the final determination to review carefully the representations contained in this document, and take them fully into account in its final determination.

Finally, we would emphasise that the Board of Thames Water is strongly committed to doing the right thing by its current and future customers. Moreover, we are confident that Management is both capable and committed to this goal. We are committed to tracking our performance closely, and keeping our customers – and our regulators – fully informed of our progress. Against this background, we sincerely hope that we can identify a way forward that avoids the time and cost associated with a CMA referral, and which allows us to get on with delivering what our customers both want and deserve.



Ian Marchant
Interim Executive Chairman

¹ See 'The Government's strategic priorities and objectives for Ofwat', Defra, 2017.

² See letter from Steve Robertson to Rachel Fletcher, 30 April 2019.

³ 86% of our customers found our business plan to be acceptable, while 84% found it to be affordable.



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Executive summary

We are very concerned about the implications of Ofwat's PR19 draft determination (DD) for the future of Thames Water and its customers and stakeholders. In this August Response to the DD, we offer new evidence in response to the DD's analysis, and explain the gap between our plan and the DD - to aid Ofwat's work to develop the final determination. We also outline a '*lower cost, lower investment*' business plan scenario, which broadly matches Ofwat's base costs for water, wastewater and retail.

We are very concerned with Ofwat's assessment - the DD is not deliverable

As a context for the proposed business plan scenario, we have the following key concerns that centre around our overall conclusion that the DD is not deliverable:

1. Ofwat's approach expects upper quartile performance for both costs and service when no comparable company has delivered this benchmark;
2. Ofwat's arguments that Thames Water should already be at the upper quartile fails to recognise previous Ofwat regulatory settlements and what they have required us to achieve;
3. Ofwat's justification for a 'step change' based on historic over-performance against previous price controls by water companies does not stand up to scrutiny;
4. Ofwat's implied productivity shift is unachievable: Ofwat's required productivity shift is at the extreme of Ofwat and Water UK consultants estimates historically for any industry and is not deliverable in a single AMP period;
5. The DD is not financeable: The DD is not financeable under any reasonable set of resilience tests as required by Ofwat;
6. We have explained the totex gap: We have re-evaluated the totex gap and identified key areas where we think the gap can be explained and request Ofwat to increase the totex allowance; and
7. The cost of capital should be higher: We disagree with Ofwat's proposed cost of capital and submit a report from Frontier Economics which provides a comprehensive analysis and supporting argument for a more appropriate cost of capital.

We discuss each point in turn below:

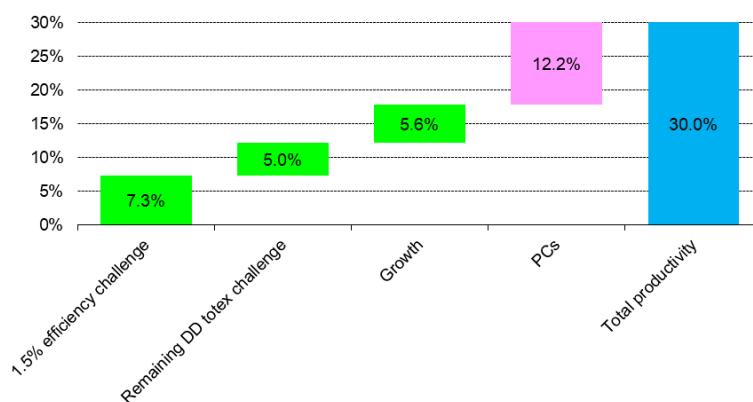
1. **Ofwat's approach expects upper quartile performance for both costs and service when no comparable company has delivered this benchmark:** The DD's allowances are benchmarked against the upper quartile *cost* companies, as well as against the upper quartile *service* companies. However, no comparable company has been both upper quartile performing for both cost and service, across water, wastewater and retail during AMP6. This means that the benchmark is unrealistic and not a reasonable basis of setting allowances.

The DD appears not to recognise that improving service incurs a cost, and increasing performance to upper quartile levels will require additional totex beyond the levels allowed in previous AMPs. Further, we do not understand the policy choice not to award enhancement allowances to companies that are not at upper quartile levels but want to improve their performance levels – this would appear to be the purpose of enhancement cases.

We are also concerned that Ofwat's approach does not reflect the precedent set by the CMA in the PR14 Bristol Water appeal, when the CMA challenged the reasonableness of assuming upper quartile performance and service.

2. **Ofwat's arguments that Thames Water should already be at the upper quartile fails to recognise previous Ofwat regulatory settlements and what they have required us to achieve:** Our current performance is the outcome of delivering against previous price controls and agreed performance levels set by Ofwat. We have broadly delivered the outputs required by each price control settlement, including agreed service levels, and with a correction for unspent allowances. During AMP6, our delivery has been comparable with other companies, which has been extremely challenging given the age of our network. Thames Water would have had to substantially exceed Ofwat's previous final determinations in each AMP to be at upper quartile today. Therefore, it is not reasonable to expect Thames Water to be at upper quartile performance today and to deliver a step change in performance, without sufficient funding and a realistic transition plan.
3. **Ofwat's justification for a 'step change' based on historic over performance against previous price controls by water companies does not stand up to scrutiny:** In adopting its 'step change' approach Ofwat asserts that the sector has consistently outperformed previous regulatory settlements, hence a 'step change' is justified. It further asserts that the level of productivity improvement in the sector over time has reduced, hence there is a need for the sector to improve. From the evidence, we believe that both of these hypotheses are incorrect, and that this justification cannot be relied upon.
4. **Ofwat's implied productivity shift is unachievable:** We are concerned that the DD has been set without assessing whether the total stretch in productivity is achievable. The DD features a lot of complex calculations in component parts of the price control. When we add together the impact of each of the stretches to totex and performance commitments, the implied productivity shift for Thames Water across the 5 years of AMP7 from current performance is c.30%, as shown in the figure below - direct totex productivity from Ofwat's figures reveal a shift of c.18% and the cost to Thames of reaching target PC levels would amount to a further c.12% shift.

Figure: Total implied productivity shift from 2019/20 to the end of AMP7



We have benchmarked this productivity shift using KPMG and Frontier Economics consultant reports commissioned by Ofwat and Water UK. The DD's implied productivity shift is much greater than the average improvement achieved by the water sector since privatisation and greater than any other regulatory or competitive market examples presented in the consultants reports – with the exception of the productivity achieved in the telecoms sector between 1994-2008, during a time of significant technological innovation; or the productivity achieved by the oil and gas industry as it significantly reduced capacity to meet falling demand during the credit crunch. Not only is the proposed productivity shift unprecedented, but neither of these examples (technological innovation or falling demand) matches the current state of the water industry.

Given these benchmarks, the DD's required productivity shift is at the extreme of Ofwat and Water UK consultants estimates historically for any industry and is not deliverable in a single AMP period.

Further, we are concerned that the DD expects improvements straight away, without glide paths or transitional arrangements. The change to a new level of totex is assumed to apply from the start of AMP7, in just 7 months' time. To meet the DD expectation, we would need to find a 17% reduction in opex during this 7 month period. While we have already set in motion a stretching Cost Transformation Programme, this reduction would not be achievable in the timeframe while also continuing to improve on performance commitments.



We are concerned that the DD does not include analysis of the total productivity shift for Thames Water – and given the number of price control levers, we fear that Ofwat may not be aware of the total impact of the DD. Therefore, ahead of setting the final determination, we ask Ofwat to consider both the implied productivity on Thames Water, as well as the short term impact, and assess the achievability of the package of measures with a realistic glide path from current performance.

- 5. The DD is not financeable:** Ofwat has a statutory duty to “secure that water companies can (in particular through securing reasonable returns on their capital) finance the proper carrying out of their statutory functions”⁴.

The DD has set multiple stretching incentives on the company to achieve totex allowances, PC outcomes and Ofwat’s choice of gearing; together with a 2.19% WACC (appointed, RPI-stripped). In order to be financeable, the actual and notional company must be able to deliver the combination of totex and PCs, with a likelihood of neutrality (i.e. no penalty or reward).

However, we are facing a significant downward skew in i) totex: the direct totex productivity shift of 18% for AMP7 is unachievable; ii) PC values and ODI penalty rates: For some PCs, the DD proposes a significant increase in outputs, together with a higher financial risk impact if the PC par value is not achieved. This implies a c.12% productivity shift, from which we can only assume penalties; and iii) further assumed penalties: We are unlikely to avoid penalties from C-MeX or cash flow reductions resulting from the gearing sharing mechanism (“GSM”).

Given this negative outlook, with totex overspend and/or ODI penalties, the DD would not generate sufficient returns to cover the cost of capital. Therefore, on an actual basis, we conclude that the DD would not allow Thames Water to finance our statutory functions, in the interests of our customers and hence is not financeable.

Further, Ofwat has interpreted its financing duty as relating only to a notional “efficient company”. Given the unachievable c.30% productivity shift, it would also be unreasonable to expect that a notionally efficient company could deliver the DD – it would also need to overspend totex beyond allowances and/or incur ODI penalties. Therefore, the notional company would not be able to earn its cost of capital and it would therefore not be financeable on a notional basis.

Non-financeability means that we would not be able to finance the delivery of our statutory obligations to provide water and wastewater services to customers now, or to protect the interest of future customers by maintaining long-term resilience. Further on this basis, we do not see a compelling investment case for any potential shareholder to invest further equity into the business.

- 6. We have explained the totex gap and ask Ofwat to increase totex allowances:** We provide new evidence to Ofwat that helps to explain the gap between our plan and the DD. There is a significant totex gap between our April plan (£11.2bn, adjusted for comparability) and the DD (£9.26bn). We have assessed this gap and believe that it can be explained, as summarised in the table below.

Table: Summary of our explanation of the gap between our plan and the DD

Issue	Value (2017/18 prices)
Ofwat's approach to totex	
Choice of benchmark years	£232-£382m
Upper quartile expectations for both totex and outcomes	£255m
Choices in Ofwat's modelling	
Impact of difference between companies on benchmarking	£53m
Allowance for growth	£94m
Real price effects	£14m
Frontier shift	£180m
Retail modelling	£89m
Enhancement and CAC cases	£1,068m
Other cost items	
Business Rates	£75m
Grants and contributions	£56m
Total	c. £2bn

Note: Enhancement costs only include those required to deliver 20% reduction in leakage. Source: Thames Water calculation.

⁴ Section 2, Water Industry Act 1991.



Ofwat's approach to totex: We have considered the DD's overall approach and have concluded:

- i. **Choice of benchmark years:** The DD's cost benchmarks produce varying results when different historical years are chosen – we are concerned about this modelling instability. When the most recent 2 years (2018/19 and 2019/20) are included, cost allowances increase overall – which reveals that industry cost trends are increasing, to achieve current levels of performance. We have reassessed the benchmarks using the most recent 2 years of data; and
- ii. **Upper quartile expectations for both totex and outcomes:** The DD's decision to benchmark Thames Water simultaneously against the upper quartile company for totex and the upper quartile company for service is unreasonable. We have calculated the additional costs the companies with upper quartile for totex would require to deliver upper quartile performance, as required by the DD.

Choices in Ofwat's modelling: In addition, there are choices in the DD's modelling, which if made differently, for fair reasons, explain part of the gap, as explained below:

- i. **Impact of difference between companies on benchmarking:** The DD assumed that any cost not explained by its econometric models is attributable to inefficiency. As a result, if some companies are different, then these differences would be deemed to be inefficient. Ofwat used to exclude smaller companies (less than 3% of the industry) from benchmarking because they were not comparable with larger firms. This has not happened in PR19. When these small non-comparable companies are removed from the upper quartile calculation then our modelling inefficiency reduces significantly.

More generally, we are concerned that an econometric approach struggles with extremities within comparator groups. In this Response, we demonstrate that Thames is a fundamental outlier on many fronts: we are the largest company, we have the most dense areas in the country, we have some of the fastest growing areas and we have the oldest water network. We are concerned that the econometric modelling has interpreted such differences as inefficiency and we ask Ofwat to check its assessment;

- ii. **Allowance for growth:** The DD internalises its assessment of growth into its modelling. However, when compared to fair forecasts where the information from local authority data was weighted to account for the historic delivery rate, then growth allowances are significantly underfunded;
- iii. **Real price effects:** Energy costs are outside our control and are impacted differently by inflation. When these are assessed, then a significant gap is revealed between our plan and the DD;
- iv. **Frontier shift:** The DD includes an efficiency shift of 1.5% p.a. based on productivity data derived from Ofwat's consultants' reports; together with an assumption that the creation of the totex concept will drive further productivity. We have benchmarked UK productivity, as well as productivity for different sectors and we can only replicate a 0.6% p.a. shift; in addition, we believe that the assumption that the totex concept results in productivity benefits is unproven; and
- v. **Retail modelling:** We provide evidence that queries the choices made within the DD's modelling of retail costs, including use of historic data, nominal pricing and the effect of transience in the models. In total, these choices explain a significant difference in retail costs.

Enhancement cases and cost adjustment claims: We have listened to the feedback on our enhancement and cost adjustment claims in the DD. Based on that feedback we have developed tailored responses for those enhancement categories where we consider that additional allowances are required. These responses can be classified into two main categories:

- i. **Enhancement costs that are misclassified as base costs:** We disagree with the DD's position that base costs are sufficient to allow companies to deliver upper quartile performance in some PCs. Alongside our arguments about the DD's treatment of upper quartile expectations, by definition, enhancement spending is needed to increase capability and improve overall performance – rather than base spending, which maintains current performance; and



- ii. **Additional evidence to justify enhancement cases' and cost adjustment claims' inclusion in the price control:** We have reviewed, amended or clarified the following enhancement cases and CACs, and we ask Ofwat to include these cases in the final determination:

- Plan leakage enhancement;
- Resilience – North East London water supply;
- WRMP – Metering;
- Lead standards;
- WRMP – Interconnection;
- Water SEMD;
- First time sewerage;
- WINEP – P removal and sanitary parameters;
- Thames Tideway Tunnel;
- CRMB depreciation; and
- London network maintenance cost adjustment claim.

Other cost items: Finally, we believe that two further items need to be included in the final determination, after being omitted from the DD:

- i. **Business rates:** Rates are outside of our control. We are due to receive 3 revaluations from the Valuation Office over AMP7. In each of the previous occasions we have seen significant rises in rates. We see no basis that would allow an observer to arrive at the conclusion that we will not incur an increase in Rates during the AMP7 period. However, we recognise the uncertainty in the quantum of the Rates increase, and therefore, in our April Submission we included rates into a true-up mechanism, to allow for a correction if rates outturn differently from forecast. However, this mechanism was rejected by the DD. Given the significance of the variance, we ask Ofwat to reconsider this mechanism; and
- ii. **Grants and contributions:** We ask Ofwat to re-consider its forecasting model, following comments made about wider growth forecasting.

We ask Ofwat to carefully consider the points raised above and the further detail we have supplied in the Appendices on Enhancement and CAC cases and how they would strengthen resilience with a view to increasing our totex allowances in the final determination.

7. **The cost of capital should be higher:** The WACC which Ofwat has included in the DD was around 20 basis points lower than the 'early view' which is set out in its December 2017 methodology. By contrast, our April Submission highlighted potential upward pressure of around 30 basis points on the 'early view' WACC which would be required to correct for concerns over how WACC components were estimated in the 'early view'.

To better understand the significant difference in estimates for the AMP7 WACC we commissioned Frontier Economics to review in detail the basis of Ofwat's DD estimate. Frontier Economics estimated an AMP7 WACC point estimate of 2.78% – towards the top of its 2.6% to 2.9% assessed range – for the appointee (in RPI-stripped terms) incorporating into their methodology: macroeconomic uncertainties, the impact of climate change and an increased risk profile.

The differences between this view of the WACC and that set out in Ofwat's DD are driven entirely by differences in methodology. Frontier Economics has extended its analysis to provide an updated estimate based on more recent market data, up to 31 July 2019.

For our business plan scenario, we have selected an appointee WACC of 2.6% which is at the bottom of Frontier's range in order to minimise the impact on customers.



Business Plan Scenario

Our September Business Plan featured an ambitious programme of investment for the future of our operation, as well as significant cost efficiencies through a 13.6% reduction in average unit base opex per customer⁵. Our April Submission responded to the challenge from Ofwat's IAP, as well as from customers and stakeholders, taking additional challenge to costs and PCs compared to the September Business Plan: specifically, through a further £400m efficiency in base costs and a further £157m efficiency in enhancement costs, while delivering better performance on pollutions, internal sewer flooding and supply interruptions, while stretching our leakage performance. As a result, the April Submission delivered a 22.5% reduction in average unit base opex per customer.

However, the DD gave Thames Water a significant further £1.7bn totex challenge, compared to our April Submission. Compared to spend in AMP6, the DD sets both a significant £800m totex challenge, plus a significant increase in outcomes levels.

We have listened to the DD's totex challenge and want to respond positively. Our *lower cost, lower investment* scenario sets out a version of our plan with less totex – broadly **meeting Ofwat's DD level of base costs for water and wastewater, as well as retail costs; with ambitious performance levels in most areas and improved service levels.**

Table: Our business plan scenario, in comparison with Ofwat's DD totex allowances (2017/18 prices)

Business plan scenario vs Ofwat July DD	Wholesale base costs – botex (£m)			Enhancement Costs (£m)			Retail (£m)	Total * (£m)
	Water	Waste	Total	Water	Waste	Total		
Ofwat DD, July 2019	3,548	4,017	7,566	615	329	944	754	9,263
Business Plan Scenario**	3,566	3,914	7,479	1,212	510	1,722	831	10,032
Remaining gap	18	-103	-87	597	181	778	77	769
Remaining gap (%)	0.5%	-2.6%	-1.2%	49.3%	35.5%	45.2%	9.3%	7.7%

Source: Ofwat's IAP and DD; Thames Water April Submission; Thames Water normalisation calculation and removing the rejected true-up mechanisms.

* To allow a direct comparison with the DD, the above table:

- Excludes grants or contributions, 3rd party services and pension deficit repair;
- Excludes TTT costs;
- Does not include the latest IFRS treatment of leases; and
- Excludes any Strategic Water Resource capex.

**Base costs include new development, new connections and addressing low pressure', which were previously classified as enhancements.

The business plan scenario reflects Ofwat's preferences for lower totex and a focus on additional stretch in specific common PCs. We offer this scenario in order to aid Ofwat's process – it does not reflect our preference for the AMP7 period, which remains our April Business Plan, given the level of investment we believe our customers have supported to enhance the long term resilience of the network.

The operational risk implied by this scenario is significant. Focusing on short term outcomes increases the risk of major outages for both water and wastewater services to customers, as we are unable to fully address low probability high consequence risks. There is also an increased environmental risk, as our *lower cost, lower investment* scenario places less emphasis on 'slow-burn', sustainable long-term solutions. This scenario therefore offers a lower level of resilience in the round, as a consequence of reduced totex.

⁵ Normalised for power and rates; measured per property, from AMP6 to AMP7.



Business Plan Scenario - Outcomes

We have listened carefully to Ofwat's feedback and have been through a rigorous process to re-interrogate our delivery plans, demanding more ambition from our business towards performance commitments.

In the vast majority of areas, we are proposing to step up to the challenge set out by Ofwat in the DD. We have considered each element of the PC/ODIs and in this Response we propose movement to Ofwat's proposed level (or in some instances, towards the proposed level) for most PCs; movement in the glide path of targets through the AMP; movement in ODI penalty rate; movement in caps and collars; and in a limited number of cases, we have added further items to allow us to reach more stretching outcomes. The table overleaf summarises our proposal for each of the key PCs.

We are only seeking to make representations in a limited number of areas where we consider the Ofwat challenge to be unrealistic, undeliverable, and/or not in the interests of our customers. These include:

- a) **Leakage:** Ofwat is proposing a reduction in leakage of 25% over AMP7. No company in recent history has delivered a level of leakage reduction near this level. We committed to a 20% reduction to 509 MI/d from 636MI/d, in our April Submission, on the basis of funding from an enhancement case. This will still be a challenging target to reach, but one we are prepared to accept, and will need to be funded in order to allow us to take the necessary steps. We maintain this commitment in this August Response.

In Chapter 6, we outline an illustration for Ofwat of the cost of measures needed to achieve the additional stretch to 25% reduction targeted in the DD, on the basis of an additional mains replacement and metering programme, funded to around an additional £300m to £350m investment;

- b) **Supply interruptions:** We are proposing a 43% reduction in supply interruptions to 6 minutes from current performance. Our target would be equal to the second strongest performer in the sector based on 2018/19 data (Wessex Water). This is a 30% reduction from our April Submission at 8.5 minutes, which, while we think is stretching, is achievable, given new operational changes.

We do not consider Ofwat's upper quartile target to be appropriate because it is based on what we consider to be unrealistic forecasts from some companies; it relies on companies measuring the target on a sufficiently comparable basis (and we have significant concerns in this regard); and Ofwat's approach makes no allowance for exogenous factors that may affect comparability in performance across companies;

- c) **Unplanned outages:** We do not consider Ofwat's target to be appropriate because it is based on unreliable data with the majority of the sector not being compliant with the reporting methodology, which means that there is significant scope for differences in reporting approaches. Given this uncertainty, we do not believe that this new measure is ready to be used to inform comparative targets with significant financial penalties attached. Therefore, we propose for this PC to be reputational, rather than financial.

Given this uncertainty, we have had additional time to review best practice reporting across other companies, which has allowed us to refine our operational plans and on this basis we estimate that we could stretch to 5% outage;

- d) **Mains repairs:** We accept the DD's 2024/25 target. However, we do not consider that the glide path that Ofwat has proposed for mains repairs to be achievable and so we propose a deliverable trajectory of targets earlier in the AMP;
- e) **CRI:** As currently defined, we consider that the CRI is too volatile to have large financial penalties attached. This can be rectified by excluding metaldehyde; and
- f) **C-MeX:** We have concerns about the comparability and the relative scoring of C-MeX, which impacts on its regulatory incentives. We propose that for the final determination, Ofwat completes the design of a metric and incentive that is based on the absolute improvement of each company.

Table: Our proposed approach on key PCs

Measure	Ofwat DD 2024/25 target	Proposed Business Plan Scenario			
		2024/25 target	Glide path to 2024/25	ODI penalty rate	Other
Key areas of disagreement with the DDs					
Leakage (based on Mid AMP6 annual average methodology)	477* (25% reduction)	509 Ml/d (20% reduction)	Our April plan basis	✓	Reducing collar to 5%
Supply interruptions (mins per property)	3 mins	6 mins	DD glide path shifted upwards to reflect new end target	Our April plan basis	14mins, 42 sec collar (April plan basis)
Unplanned outages (% peak week capacity)	2.34%	5%	Straight line from 18/19 position similar to other companies	Non-financial ODI	True-down for specific related enhancements
Mains repairs (No. per 1k km of mains)	231.3	✓	Straight line from current position similar to other companies	Our April plan basis	
CRI (Index)	0.00	0.00	n/a	✓	Exclusion of metaldehyde
C-Mex	n/a	n/a	n/a	n/a	Proposing an alternative structure to the incentive, and other changes
Other measures**					
Per capita consumption (litres/head/day 3 year average)	6.3% reduction	✓	✓	Our April plan basis	
Acceptability of water to consumers (No. contact/1000 population)	0.6	✓	✓	Our April plan basis	
Internal sewer flooding (No./10k properties)	1.34	✓	New profile to reflect actions to meet Ofwat target	Our April plan basis	Exclusion for extreme weather; Collars as per our April plan basis
Blockages (Number)	62,500	✓	✓	Our April plan basis	Penalty collar to 120k
Pollution incidents (No. /10k of mains)	19.5	✓	✓	Our April plan basis	Reducing collar as per our April plan basis
D-MeX	n/a	n/a	n/a	n/a	We comment on the structure of the metric
Renewable energy generation (GWhrs)	517	✓	✓	✓	Remove cap/collar
Sludge treated before disposal (%)	n/a	n/a	n/a	n/a	Excluding untreated sewage exported to 3 rd parties for treatment
SEMD	100%	✓	-	AMP6 legacy PC, ODI rate same as AMP6; AMP7 rate related to project delay	Remove AMP6 legacy PC;
Environmental measures definition (No. sites)	724	✓	✓	✓	Ability to update target based on EA agreed changes
Empty household properties (voids) (% of household properties)	✓	✓	✓	✓	-
Number of customers on the priority services register (% reached/actual/attempted contact)	7% / 50% / 90%	✓ / 30% / ✓	n/a	n/a	
Achieving British Standard BSI8477 for Inclusive Service Provision	✓	✓	Accreditation in 2020/21	✓	Drafting change on first year target

Source: Thames Water. ✓ = accepting DD target/basis; * Rebased for comparability with the April plan basis; ** Thames Tideway Tunnel PCs discussed in Appendix TW-DD-A10.



The business plan scenario reflects Ofwat's preferences for lower totex and a focus on additional stretch in specific common PCs. However, this focus requires us to remove some of our bespoke PCs, because we are unlikely to be able to deliver as many of the 'slow burn' sustainable and environmental improvements that we envisaged in our April plan, as well as less resilience in the round. The reduction in totex and focus on common PCs results in the following bespoke PCs being removed:

- Sewage pumping station availability;
- Surface Water Management;
- Water Quality Events; and
- Responding to Trunk Mains Bursts.

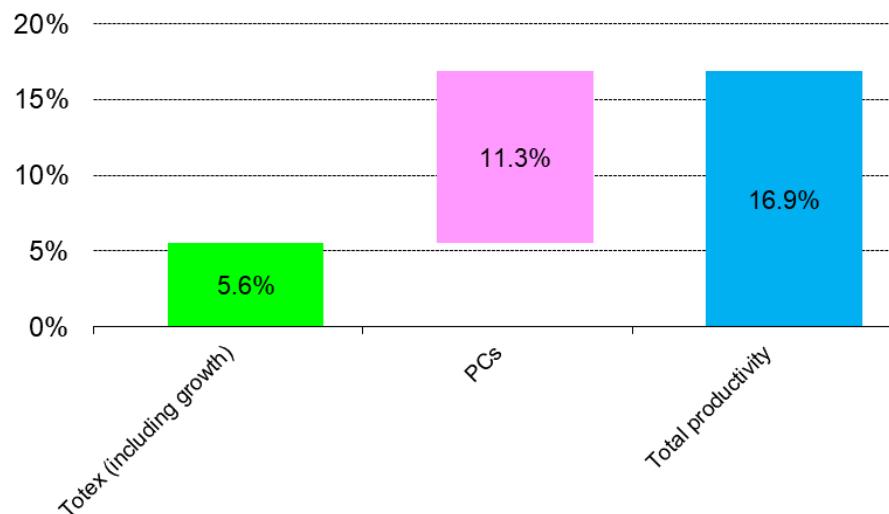
In addition, we consider that the bespoke PCs listed below duplicate other measures that we are committing to elsewhere and should be removed. This removal would allow greater management focus on delivering common PC stretching targets:

- Percentage of satisfied vulnerable customers;
- Installing new smart meters in London;
- Replacing existing meters with smart meters in London; and
- Legacy SEMD.

The business plan scenario is financeable and its implied productivity shift is achievable

We have assessed both the financeability and productivity shift implied by this *lower cost, lower investment* scenario and can confirm that the scenario is achievable. Specifically, the scenario implies a challenging, yet achievable 17% productivity shift, as shown in the figure below.

Figure: Business plan scenario: Total implied productivity shift from 2019/20 to the end of AMP7



While the business plan scenario is financeable, we anticipate significant performance penalties within the business plan scenario, as we challenge our operation to meet the additional stretch in our performance commitments.

The business plan scenario is offered as an integrated package, seeking to balance totex efficiencies, increased performance commitments, stretching ODIs, a financeable WACC and an overall 'step change' in productivity. We ask that, while each element should be examined in its own right, the balance of the proposal be considered as an integrated whole, in term of its stretch and ambition to deliver for customers, the environment and all stakeholders, while ensuring resilience in the round.



Our request of Ofwat

We have carefully considered and responded to the draft determination from Ofwat. Through the PR19 process, we have been fully committed to delivering a customer led, high quality and deliverable Business Plan for 2020-2025. We have satisfied ourselves that our original plans, this August Response to the draft determination and our proposed business plan scenario demonstrate that we are maintaining our customers' expectations of a responsible water and wastewater company.

Ofwat has requested a series of action plans in which we will explain how we will deliver leakage, supply interruptions, unplanned outage, an integrated resilience framework and DWMP. Owing to the time pressures involved in forming this Response and business plan scenario, not all of the action plans can meaningfully be fulfilled within the August deadlines originally set. However, we remain determined to provide conclusive evidence within a short window, and that the deliverability of our plan remains achievable and therefore, in the interests of our customers.

We want to work with Ofwat to ensure that the points we raise in this August Response are understood without ambiguity and to explore ways to find a final determination that is financeable, with a challenging, yet achievable productivity shift, and that fulfils the interests of customers, both in terms of investing in the future and focusing on improved performance in the right areas. We look forward to presenting our plans to deliver AMP7 in the next months and to working collaboratively with Ofwat ahead of the final determination.



Chapter 1

Introduction

A Our Response to Ofwat's Draft Determination

- 1.1 We published our Business Plan for PR19 in September 2018 ("September Business Plan"). This outlined an ambitious programme of investment for the future of our operation, an efficient projection of our base costs and a fair return for shareholders – all in the interests of our customers.
- 1.2 In January 2019, Ofwat published its Initial Assessment of Plans ("IAP") for all water and sewerage companies, and water only companies in England and Wales. Ofwat's IAP for Thames Water rates the September Business Plan as requiring *Significant Scrutiny*.
- 1.3 We responded to the IAP with our April Submission. This took into account the feedback from the IAP, as well as from customers and stakeholders, taking significant additional challenge to costs and performance commitments compared to our September Business Plan. Specifically, the April Submission:
 - Delivered better performance on pollutions, internal sewer flooding and supply interruptions; while stretching our leakage performance;
 - Found a further £400m in base cost efficiencies and £157m in enhancement cost efficiencies;
 - Removed the risk to customers from uncertainty about some costs - £175m if uncertain costs were removed into recovery mechanisms, with the option of a mechanism for a further £253m;
 - Agreed a form of gearing sharing mechanism to incentivise de-gearing, while paying historically low dividends to shareholders; and
 - Reduced our average annual combined household bills by £5, equivalent to 1.3%, by 2024/25, in real terms.
- 1.4 In July 2019, Ofwat published its Draft Determinations (DDs) for the companies in significant scrutiny and slow track categories, which considered our April Submission. We were disappointed that the DD featured even more demanding PC targets, at the same time as reducing the totex allowance lower than the IAP level and decreasing the industry cost of capital.
- 1.5 This document is our response to Ofwat's DD for Thames Water. We outline our overall concerns with the DD; we demonstrate our willingness to work with Ofwat through a Business Plan Scenario, that outlines a lower totex plan and the consequences for operational risk; and it provides a detailed critique of Ofwat's DD methodology to help Ofwat to understand the remaining gaps between our plan and the DD and to challenge Ofwat to change its approach.



B This document

1.6 This document focuses on key areas of concern for Thames Water, our customers and Ofwat, within the following chapters:

- **Part A: Thames Water's concerns with the DD:**
 - **Chapter 2: Our concerns with Ofwat's overall approach:** We outline our concerns with the approach taken to form the DD for Thames Water;
 - **Chapter 3: Ofwat's productivity shift is unreasonable:** We compile the total productivity shift from our actual position in 2019/20 and demonstrate that this is unreasonable;
 - **Chapter 4: The DD is not financeable:** We demonstrate that the risk and return basis of the DD is not financeable, and is unlikely to attract new equity.
 - **Chapter 5: Costs:** We describe the remaining gap for totex between the DD and our plans;
 - **Chapter 6: Risk and return:** We describe our concerns about the DD's choices for the risk/return basis of the price control.
- **Part B: Business Plan Scenario:**
 - **Chapter 7: Business Plan Scenario:** We describe a variant of our April plan with lower totex, but with higher delivery risk.
 - **Chapter 8: Business Plan Scenario - Outcomes:** We describe the remaining gap for PCs and ODIs between the DD and our plans; and
 - **Chapter 9: Achievability of the business plan scenario:** We discuss the financial aspects of the business plan scenario.

1.7 Finally, in **Chapter 10**, we provide Board endorsement.

1.8 We also include a number of appendices that provide greater detail on key topics.

C Other supporting material

1.9 Alongside this submission, we also provide to Ofwat:

- **Data tables:** Ofwat requested the completion of 7 core data tables. We provide:
 - **Amended April plan:** We provide 6 out of 7 of these tables for our central April plan, amended for further items that need to be recognised. This plan totals £11.2bn totex. In addition, we are providing App29 tax;
 - **Business plan scenario:** In Chapter 7, we outline our scenario. In order to aid Ofwat, we will provide the core data tables for this scenario by mid-September;
- **Developer services data request tables:** Completed, as requested by Ofwat;
- **Outcomes data tables:** Completed, as requested by Ofwat;
- **Pro forma:** In order to help Ofwat reference our responses to its interventions, we have provided a set of document maps following Ofwat's pro forma; and
- **Action plans:** Ofwat has requested a series of action plans. Owing to the time pressures to complete this Response in 6 weeks, we are in a position to supply input on DWMP in August and will supply the remaining action plans in September.



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PART A: THAMES WATER'S CONCERNS WITH THE DRAFT DETERMINATION



Chapter 2

Our concerns with Ofwat's overall approach

A Introduction

- 2.1 In this chapter, we comment on the appropriateness of Ofwat's overall 'step change' approach at PR19 and specifically its position that a notionally efficient company should be delivering at or close to the Upper Quartile (UQ) performance rate across a range of PCs while also being UQ in cost efficiency terms to other companies.
- 2.2 The evidence demonstrates that Ofwat's approach does not adequately reflect the performance of the sector, or that of a 'notional' company, and does not appear to be justified by the arguments Ofwat has made to support it. Considering Ofwat's changes to the regulatory framework over time and in comparison to other companies, Thames Water has largely met its regulatory targets from previous controls and where it has not done so it has incurred penalties or returned allowances to customers, we believe this should be better reflected in Ofwat's approach.
- 2.3 We discuss each of these areas in the following sections:
 - **Section B:** Our overall concerns with Ofwat's 'step-change' approach;
 - **Section C:** Ofwat's approach is not a reasonable basis for setting the level of regulatory challenge and does not follow the CMA precedent;
 - **Section D:** Ofwat's justifications for its 'step change' approach appear to be incorrect; and
 - **Section E:** Ofwat's arguments that Thames should meet UQ service performance through base cost allowances fail to adequately recognise our previous regulatory settlements.
- 2.4 Finally, **Section F** concludes.

B Our overall concerns with Ofwat's 'step change' approach

- 2.5 In its PR19 approach, Ofwat is setting a materially greater efficiency challenge for water companies relative to previous price determinations. Ofwat has explicitly stated that this is its intention:

"in our 2019 price review (PR19), we expect a step change in efficiency for the sector."⁶
- 2.6 In implementing its 'step change' approach Ofwat has adopted a methodology in the price review which requires the notional company to move to the upper quartile level of efficiency in the sector

⁶

Ofwat, 2017, 'Delivering Water 2020: Our final methodology for the 2019 price review.' p. 135.



(based on its suite of econometric cost models that we comment upon in Chapter 5). In fact Ofwat's approach, set across six different price controls asks each company to be as efficient as a hypothetical 'upper quartile' company across each control (i.e. these are difference companies for each control) with an additional stretching frontier shift of 1.5% per annum then applied.

- 2.7 In parallel, Ofwat has also set some very stretching service improvement levels often based on comparative benchmarking of performance targets at the upper quartile of companies forecast performance levels. It has also attached to these service targets greater in-period financial incentives substantially increasing the impact on companies of failing to deliver these targets. In setting these targets Ofwat has made almost no allowances for Thames Water or any company across the sector to invest to meet them, instead reflecting that companies should fund these service improvements from their base costs:

"We consider that our package of common performance commitments with stretching performance commitment levels, represents a base level of service. We expect an efficient company to be able to deliver our performance commitments levels through our base allowance. We have therefore rejected requests for enhancement costs to catch up with our stretching performance commitments."⁷

- 2.8 This approach sets a substantial level of challenge on the sector for the 2020-25 period. Ofwat is proposing that companies should meet this level of challenge almost immediately with costs and service levels expected to adjust rapidly to meet new target levels in the first year of the control from April 2020, just seven months away. While Ofwat has made some adjustments in its DD's, for example including some glide paths for supply interruptions or widening dead-bands for some measures, these concessions are relatively minor.
- 2.9 Ofwat's step change approach is in part justified by a perception that there has been some consistent outperformance by companies in the past relative to previous regulatory settlements, i.e. previous determinations have not been challenging enough, hence there is a justification for a tougher settlement this time. For example, we note that in its DDs, Ofwat stated that:

"In relation to cost allowances, from 2015-2018 companies 'on average' outperformed by an amount equivalent to 0.6% return on regulatory equity (RORE)."⁸

"In relation to outcomes delivery incentives (ODIs) over the same period companies have outperformed by an amount equal to 0.13% of RORE, on average."⁹

- 2.10 It also argues that there has been a slowing of sector productivity over time since privatisation. For example, in its Initial Assessment of Plans (IAP) Ofwat stated:

"There appears to be scope for water companies to improve on-going efficiency. The Frontier Economics study for Water UK shows that in the period immediately after privatisation productivity growth was 3.5% to 4.5% per year, but has shown little change since 2011."¹⁰

⁷ Ofwat, 2019, 'PR19 Draft Determinations: Securing cost efficiency technical appendix', p.40.

⁸ Ofwat, 2019, 'PR19 Draft Determinations: Aligning risk and return technical appendix.' p.19.

⁹ Ofwat, 2019, 'PR19 Draft Determinations: Aligning risk and return technical appendix.' p.15.

¹⁰ Ofwat, 2019, 'Initial Assessment of Plans: Technical appendix 2: Securing cost efficiency.' p.41.



2.11 We have a number of specific concerns with Ofwat's approach, which we summarise here and describe in greater detail in the remaining sections of this Chapter:

- a) **Ofwat's approach expects upper quartile performance for both costs and service when no comparable company has delivered this benchmark:** In adopting its 'upper quartile cost and service' approach Ofwat is seeking a level of overall performance on costs and service that to our knowledge no comparable company in the sector in AMP 6 has ever delivered. We are concerned that this may not be a reasonable basis of setting the level of regulatory challenge for the notional company in the sector. This was an issue challenged by the Competition and Markets Authority in the PR14 Bristol Water appeal. Ofwat's approach does not appear to reflect this precedent;
- b) **Ofwat's justifications for its 'step change' approach appear to be incorrect:** In adopting its 'step change' approach Ofwat suggests that the sector has consistently outperformed previous regulatory settlements, hence a 'step change' is justified. It further asserts that the level of productivity improvement in the sector over time has reduced, hence there is a need for the sector to improve. Both of these hypotheses appear to be incorrect, as we explain in the section below;
- c) **Ofwat's arguments that Thames Water should simply catch-up more rapidly with the rest of the industry do not appear to adequately recognise our previous regulatory settlements:** We are concerned that Ofwat's DD asks Thames Water to meet the UQ performance on a number of metrics without adequately recognising the service levels agreed and delivered in previous settlements. Fundamentally our analysis shows that up to the end of AMP 5 Thames has broadly delivered the outputs required by each price control settlement, including agreed service levels, and where outputs were not delivered monies were returned to customers through various regulatory mechanisms. During AMP 6 our delivery has also been 'in the pack' compared to other companies. Ofwat set these determinations, including the true-up mechanisms at the end of each control and Ofwat's DD's should recognise that those settlements included agreed service levels that were broadly delivered. The comparative difference in performance is not a result of some poor performance on Thames' part that now needs to be corrected;
- d) **Ofwat does not appear to have assessed the level of productivity improvement it is imposing on Thames Water and the sector in aggregate but our estimates show that the level of challenge is unachievable:** We have tried to compile the overall level of productivity improvement Ofwat has required for AMP 7 for Thames and compared this to both other benchmarks used by Ofwat (including competitive benchmarks) and previous determinations. Ofwat does not appear to have considered the totality of the productivity improvement required by its DD which is cause for concern. The analysis suggests that Ofwat's DD represents a material shift in productivity improvement over a short period and is well beyond what can be observed in other comparative markets; and
- e) **Ofwat's DD is unfinanceable for Thames Water and the notional company across the sector:** We have analysed the financeability of the DD and we confirm in Chapter 3 that it is non-financeable.

2.12 We discuss the evidence supporting the remaining concerns below, while financeability concerns are addressed in Chapter 4.



C Ofwat's approach is not a reasonable basis for setting the level of regulatory challenge and does not follow the CMA precedent

- 2.13 Ofwat has imposed a top-down upper quartile challenge on companies allowed costs and also a very wide range of service performance metrics, again generally at the UQ. In seeking to understand the reasonableness and deliverability of Ofwat's 'UQ' approach, we have examined companies' business plans and compared those original plans with Ofwat's DD cost and performance targets. We have used the business plans because the targets are all forward looking estimates and the plans should demonstrate some degree, at least in aggregate, of what the sector considers is achievable. If Ofwat's approach were reasonable and deliverable for the notional company then we would observe that this level of UQ performance on service and costs was predicted for a reasonable number of companies in AMP7.
- 2.14 The table below sets out the water and wastewater cost gaps for companies' plans versus the Ofwat cost allowances as well as whether their original plans set out performance targets in line with the UQ for each service metrics against a small sub-set of the PCs.
- 2.15 The analysis suggests that where Ofwat has made use of comparison-based targets Ofwat's approach may not sufficiently recognise the relationship between costs and performance, and it appears to have cherry-picked a suite of targets which do not reflect the performance of any actual company.

Table 1: Company cost and PC performance

Water Company	Water totex cost gap	UQ for Supply Interruptions?	Wastewater Company	Wastewater totex cost gap	UQ for Pollution Incidents?	UQ for Internal Sewer Flooding
Portsmouth	-14%	Y	Hafren Dyfrdwy	-10%	N	N
Hafren Dyfrdwy	-1%	N	Severn Trent	-6%	N	N
United Utilities	1%	N	Southern	7%	N	N
South West	2%	N	United Utilities	7%	N	N
Wessex	6%	N	South West	7%	Y	N
Northumbrian	6%	N	Thames	9%	N	N
Affinity	9%	N	Dŵr Cymru	11%	N	N
Severn Trent	10%	N	Wessex	12%	Y	Y
South Staffs	12%	N	Northumbrian	13%	Y	Y
Yorkshire	12%	Y	Anglian	17%	N	Y
Southern	13%	N	Yorkshire	21%	N	N
South East	14%	N				
Bristol	15%	Y				
SES	17%	Y				
Dŵr Cymru	20%	N				
Thames	22%	N				
Anglian	27%	N				

Source: Ofwat (2019) 'PR19 draft determinations: Cost of capital technical appendix', and Ofwat (2019) 'Technical appendix 1: Delivering outcomes for customers'.



- 2.16 As can be seen from the above, the companies whose plans informed the upper quartile performance targets are generally seen as having higher than average costs in Ofwat's cost models. The only exception being Portsmouth Water on supply interruptions. Portsmouth Water is the smallest company in the sector (serving less than 10% of the water customers served by Thames Water), which has an atypical network due to having historical investment made in order to ensure enhanced levels of resilience for Portsmouth's military dockyard.
- 2.17 While we agree in principle with Ofwat's aim of setting stretching performance targets, any target set must be robust and achievable. Where no single company has proposed to deliver Ofwat's package of UQ measures it does not seem reasonable to set these cherry-picked targets at an aggregate level for the notional company.
- 2.18 In the Bristol Water appeal to the CMA for the 2014 price review, it seems that the CMA also raised a similar challenge. At PR14 Ofwat applied a similar approach, albeit it was applied to a much smaller set of service PCs and less aggressively. This approach was challenged in the CMA appeal and the CMA raises similar concerns about the reasonableness of the approach. Specifically the CMA noted:
- “...for Ofwat to consider that upper quartile performance (historical or otherwise) would match economic levels appeared unlikely to us in general.”¹¹*
- 2.19 The evidence suggests that Ofwat has cherry-picked its UQ targets for the DDs. While we accept that Ofwat needs to challenge the sector to improve in its role, we are concerned that it may have chosen a set of determinations that in the round are clearly undeliverable and unreasonable for the sector. This does not appear to be a reasonable approach for the notional efficient company. It is also clear that the same issue was considered by the CMA in the Bristol appeal and they did not support this approach and instead set the performance targets largely based on Bristol's customer research rather than through comparative benchmarking.
- 2.20 In Chapter 5 we reconsider this point and provide an estimate of the additional costs of delivering upper quartile performance. This analysis uses the marginal cost of improvement rates from the UQ companies.

D Ofwat's justifications for its 'step change' approach are incorrect

- 2.21 As we have suggested, Ofwat justifies its 'step change' approach based on two factors:
- A suggestion that companies have historically outperformed the settlement in the past and that this outperformance demonstrates that a 'step change' is appropriate; and
 - An inference that productivity improvement has slowed down in the sector since privatisation and so a 'step change' is appropriate to put the sector back on track.
- 2.22 The overall sector performance versus regulatory allowances was also examined in an independent report for Defra¹². This report similarly did not conclude that there had been

¹¹ CMA, 2015, Bristol Water Appeal: https://assets.digital.cabinet-office.gov.uk/media/56279924ed915d194b000001/Bristol_Water_plc_final_determination.pdf

¹² Vivid economics, 2018, 'Fair rate of return for the regulated water industry in England and Wales'.

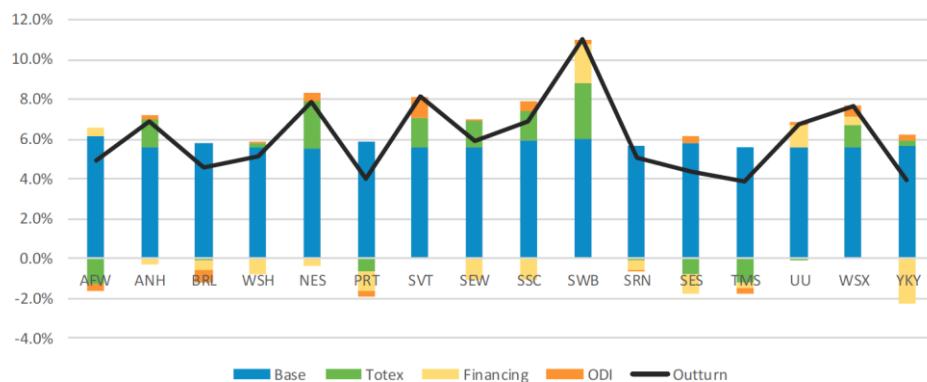


systematic and consistent outperformance by companies of the regulatory settlement. Instead it concluded that:

*"critical aspects of economic regulation in the sector have been no more generous to companies than the frameworks applied to other UK network industries and that, to the extent that returns have been higher than earned by international comparators, it is not clear that this has been to the overall detriment of customers."*¹³

- 2.23 Indeed, the same report provides analysis of return on regulatory equity for the 2015-17 period and this also shows that, for the most recent period eight companies have under-performed relative to the base assumed overall return and eight have out-performed the base return. We note that this analysis excludes the most recent year but it clearly does not support the hypothesis that companies have consistently outperformed in AMP 6.

Figure 1: Return on regulatory equity, 2015-17



Source: Copied from Vivid economics, 2018, 'Fair rate of return for the regulated water industry in England and Wales', p.19.

- 2.24 The second argument Ofwat uses to justify its 'step change' approach is that the level of productivity in the sector has fallen since privatisation and that there is therefore scope for improvement. Effectively Ofwat suggests that the sector's productivity has slowed relative to the rest of the economy and so there should be scope to 'catch-up' with other sectors.

*"There appears to be scope for water companies to improve on-going efficiency. The Frontier Economics study for Water UK shows that in the period immediately after privatisation productivity growth was 3.5% to 4.5% per year, but has shown little change since 2011"*¹⁴

- 2.25 Our first concern with this hypothesis relates to what would normally be expected from sector productivity over time in a mature sector like water, which was privatised some 30 years ago and has been subject to independent economic regulation over that period. Economic theory would support the view that after the paradigm shift of privatisation the level of productivity improvement in the sector would initially be expected to be high before a gradual reduction over time¹⁵. Ofwat's

¹³ Vivid economics, 2018, 'Fair rate of return for the regulated water industry in England and Wales', p.35.

¹⁴ Ofwat, 2019, 'Technical Appendix 2: Securing cost efficiency', p.41.

¹⁵ There are a number of studies that would support this view that productivity improvement in regulated utilities. Indeed this experience is observed in the water sector in a number of detailed academic studies including: Saal and Parker (2001): Productivity and Price Performance in the Privatised Water and Sewerage Companies of England and Wales, Botasso & Conti (2009): Price-cap regulation and the ratchet effect: a generalized index approach, Maziotis, Molinos-Senante & Sala



comments appear to ignore this evidence and instead argue that the sector productivity rates have slowed and now need to catch-up with previous levels. This appears to be incorrect.

- 2.26 While productivity improvement in the water sector has slowed this is only to be accepted following the significant structural changes post-privatisation. This point does not appear to be recognised by Ofwat but is apparent in a wide range of other literature and analyses. Indeed, the same Frontier Economics report comments that:

"This [analysis] appears to suggest that productivity growth was driven both by investment to increase drinking water quality standards and to meet more stringent environmental regulations to reduce the impact of wastewater discharges on the aquatic environment. Also, the 'privatisation' effect (and/or the impact of adopting a high powered incentive regulation system) prompted companies to become more efficient reducing their inputs, particularly opex. However from 2006 on, the growth in outputs shrunk significantly (so that productivity growth remained positive but slowed). From 2012 onwards input usage increases significantly outweighed modest increases in output, to deliver a falling productivity growth trend overall."¹⁶

- 2.27 This trend of decreasing gains following a structural or ownership change is also referenced in the reports of Ofwat's own advisors. For example in the KPMG and aqua consultants' report, they examine a range of '*examples of reported performance improvements associated with structural or regulatory changes*'¹⁷. In summarising the findings from that analysis the authors note:

"The evidence is also mixed on the longevity of the impact of the documented performance, and, potentially, associated efficiency gains, over time. Some examples exhibit diminishing gains over the next five year period (e.g. Scottish Water, Openreach separation) while others show increasing gains (e.g. privatisation of electricity distribution and new gas distribution networks). Overall, however, diminishing efficiency benefits appear to be common in subsequent periods."¹⁸

- 2.28 The same study also concludes that diminishing returns would also be prevalent from the outcomes and totex mechanisms, largely based on the experience of the energy distribution network price controls, between the second control period and the first which is the focus of the report.
- 2.29 If the water sector can be shown to be materially underperforming relative to the levels of productivity improvement in other, comparable sectors across the UK economy then we would accept that there should be scope for productivity improvement in the sector and there could be justification for Ofwat's 'step change' approach. If that were to be the case then the sector would, reasonably have a case to answer. In fact this comparison is one of the core objectives of the Frontier economics study. However, that study actually fundamentally finds the opposite to be

Garrido (2017): Assessing the Impact of Quality of Service on the Productivity of the Water Industry: A Malmquist-Luenberger Approach for England and Wales and Saal, Parker, & Weyman-Jones (2007): Determining the Contribution of Technical Change, Efficiency Change, and Scale Change to Productivity Growth in the Privatised English and Welsh Water and Sewerage Industry: 1985-2000.

¹⁶ Frontier Economics, 2017, 'Productivity improvement in the water and sewerage industry in England since privatisation', p.23.

¹⁷ KPMG and aqua consultants, 2018, Innovation and efficiency gains from the totex and outcomes framework, p.17.

¹⁸ Ibid, p.18.

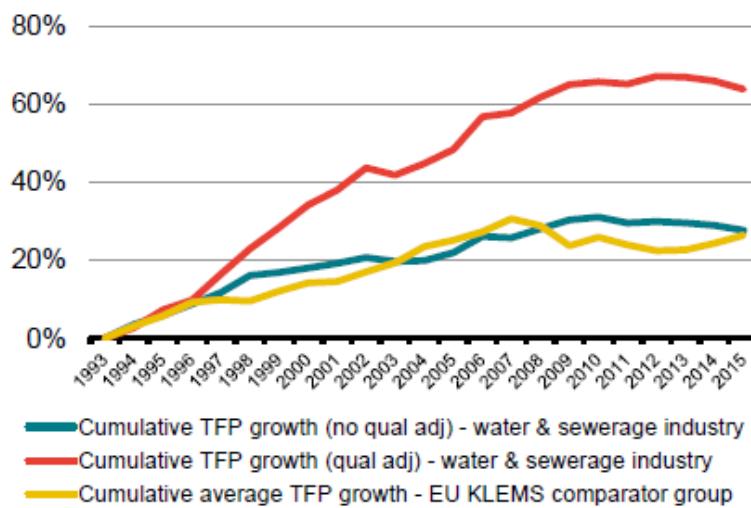


true levels of productivity in the water sector are comparable or higher (once they have been adjusted for quality) than other comparator sectors.

"Quality adjusted cumulative TFP growth in the water and sewerage sector is materially larger than amongst the comparator group, while a highly conservative comparison on a quality unadjusted basis illustrates similar cumulative TFP growth in water and sewerage compared to the comparator group."¹⁹

- 2.30 Figure 2 below compared Total Factor Productivity (TFP) growth in the water and sewerage industry with cumulative average growth in the comparator sectors from the EU KLEMS database and is drawn from the Frontier Economics report.

Figure 2: Cumulative TFP growth in the Water and Sewerage Industry and the EU KLEMS comparator group



Source: Copied from Frontier Economics, 2017, 'Productivity improvement in the water and sewerage industry in England since privatisation' p.33, figure 21. Analysis undertaken by Frontier Economics using EU KLEMS data.

- 2.31 Ofwat's justification that there remains scope for productivity improvement in the sector or that the sector has fallen behind the rest of the economy is inconsistent with the Frontier economics report and does not appear to be supported by strong evidence.

E Ofwat's arguments that Thames should meet UQ service performance targets through base expenditure do not appear to adequately recognise previous regulatory settlements

- 2.32 Thames Water's current position has been determined by allowances in past regulatory determinations. Our current bill levels, below the average for the sector on a combined basis, and service levels reflect this historical position. These cannot be reasonably assumed to imply that

¹⁹

Frontier Economics, 2017, 'Productivity improvement in the water and sewerage industry in England since privatisation', p.33.

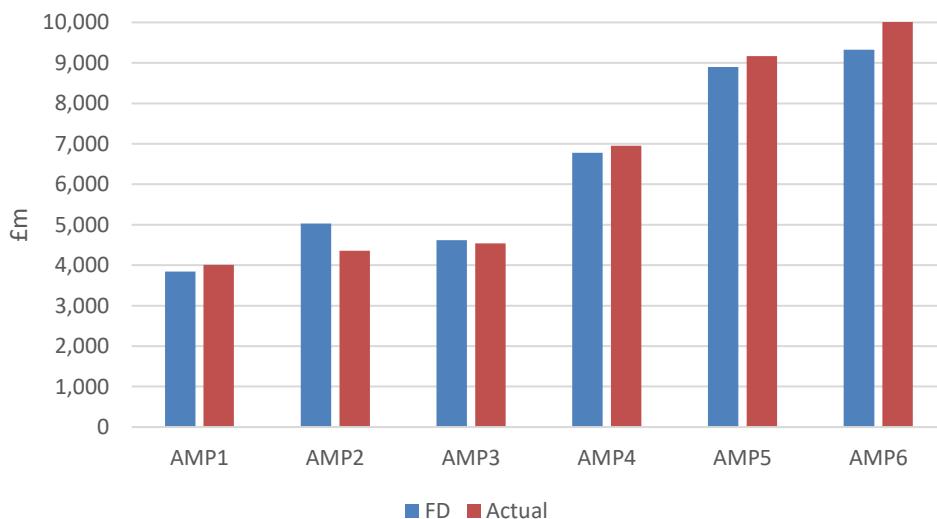


we would be in a position now to meet UQ performance on the range of measures Ofwat has set out.

Historical performance

- 2.33 Looking back over the period since privatisation, we have spent over and above the final determination ("FD") allowances for Totex. Overall, we have spent the total of £39.1bn compared to our cumulative FD allowances of £38.5bn, which is 1.60% more than what customers have funded. The chart below compares actual Totex to the FD by AMP over this period.

Figure 3: Thames Water FD vs Spend Across AMPs



Source: Thames Water analysis. Numbers expressed in outturn prices.

Note: Final Determination allowances for each AMP shown reflect relevant changes to assumed inflation, logging up/down adjustments and impact of other incentive mechanisms which are taken into account by Ofwat at the following price review. The charts show comparative spend across the period, including Retail, and the Thames Tideway Tunnel ("TTT").

Actual expenditure includes monies incurred at shareholder expense as agreed within Section 19 undertakings for leakage (being £150m in AMP4 and £92m in AMP6).

- 2.34 During the periods from AMP1 to AMP5, Ofwat's Final Determinations (FDs) were set at a relatively granular level, with separate allowances for opex and capex within water and wastewater (while retail costs were allocated across the two services).
- 2.35 Customers were protected through detailed reporting within annual returns in which expenditure and outputs were compared to that funded by customers through the FD. A regulatory process required 'logging up' additional expenditure in the RCV for new outputs and 'logging down', or deducting allowed expenditure, where outputs were no longer required or not delivered by companies. This provided appropriate protection for customers.
- 2.36 This logging down process helped to ensure that customers did not pay twice for activities. For example, if something was allowed in a previous AMP period, but not delivered and hence logged down, then customers would not have incurred that cost. If the same or similar activity subsequently is required in subsequent AMPs then it can be funded by customers in the later periods, without the risk of paying twice for the work.



- 2.37 Key elements of the regulatory process during this period included the change protocol and shortfalling assessments, the latter broadly falling into two categories — those relating to serviceability and those relating to other factors.
- 2.38 Shortfalling operates to return funded allowances to customers through an RCV reduction (including associated financing costs in AMPs 1-4), informed by the Change Protocol in AMP5 and equivalent processes in prior AMPs for material reductions in outputs required or delivered.
- 2.39 The change protocol operated for the AMP5 period, provided a framework to deal with material changes in the investment programme²⁰. This allowed Ofwat to update the CIS baseline that it set at PR09. This process helped ensure that the impact of any material reduction in output requirements, or delivery on these by companies, could be removed from the RCV through logging down or shortfalling to ensure that customers were protected.
- 2.40 For AMP5, we were shortfalls £11m for non-delivery of certain SEMD schemes (water service) and billing system improvements (water and waste services). Similarly, we were logged down by £235m for agreed changes to the scope of the capital programme funded at PR09 relating to sewer flooding, the Lee Tunnel, Hendon Way and Deephams. These reductions to the RCV ensured that customers did not incur the cost of this work. Therefore, if investment is subsequently required in future periods then customers will not have paid twice for it.
- 2.41 A second key component of the shortfalling process was the serviceability assessment²¹. Serviceability was the historical method used by Ofwat for assessing whether companies were properly managing and maintaining their asset systems so that they remained fit for purpose to maintain the flow of service to customers.
- 2.42 Serviceability was classified into one of four performance categories, which were graded by the order of severity, where “Improving” was the best assessment, followed by “Stable”, then “Marginal”, and “Deteriorating” being the worst. At PR09, companies were funded to achieve stable serviceability by 2012 and to maintain this for the remainder of the 2010-15 period.²² In other words, companies received funds specifically to ensure that they were able to maintain a stable serviceability performance at an efficient cost.
- 2.43 Companies were at risk of Ofwat clawing back a proportion of the expenditure that it had allowed when setting price limits at PR09 to deliver stable serviceability to their customers, if they failed to do so. Ofwat clawed back allowed expenditure by reducing the regulatory capital value (RCV) as explained above.

²⁰ Ofwat considered material changes to be “when the net present value of the costs or savings associated with the change up to the next pricing period exceeds 2% of the relevant service turnover” Ofwat, 2009, Change protocol for 2010-15, “Principles and outline procedures for companies to seek financial adjustments relating to changes to outcomes in the 2010-15 period”.

²¹ See Ofwat, 2017, Updated 2010-15 reconciliation, section 2.

²² Ibid, p.5 para 2.5.



- 2.44 For the AMP5 period, Ofwat finalised its assessment of our serviceability within its 2010-15 blind year true-up assessment²³ following its initial assessment in the PR14 FD:
- For the water service, Ofwat assessed our serviceability for infrastructure and non-infrastructure to be stable across all years of AMP5 – giving rise to no serviceability shortfall adjustments;
 - For the wastewater non-infrastructure service, Ofwat also assessed that our serviceability was stable across all years of AMP5, leading to no serviceability shortfall adjustments; and
 - For the wastewater infrastructure service, Ofwat assessed our service to be stable for the first two years of AMP5 but deteriorating for the final three years. This led to serviceability shortfalls for pollution incidents, sewer flooding other causes and sewer blockages totalling £33.8m²⁴.
- 2.45 This serviceability assessment confirmed for the AMP5 period that the company achieved stable serviceability in line with its funding at PR09 for three out of four of its service categories, with funding returned to customers via a shortfalling adjustment where it fell short on wastewater infrastructure.
- 2.46 Looking back at the 2005-10 period, there were no shortfalling adjustments applied at PR09 for the AMP4 period, which indicates that key outputs and service were at satisfactory levels (subject to an OPA penalty of -0.2%).
- 2.47 TW's serviceability level at the end of the AMP4 was 'Improving' for sewerage infrastructure and 'Stable' for the other three service areas. This was achieved following a successful programme to improve serviceability through this AMP period. Logging down comprised two main items, £15m for fewer connections delivered than expected at PR04 and £141m relating to delays in delivery of improvements at Tideway treatment works.²⁵
- 2.48 For the AMP6 period the regulatory processes and control mechanisms have changed significantly from the previous periods with the introduction of Totex allowances, supported by broader performance commitments to key outcomes, and associated outcome delivery incentives (ODIs) to deal with over- and under-delivery.
- 2.49 Performance commitments and associated ODIs provide customers with protection with regard to key levels of performance and, in some cases, delivery of specific schemes or narrower output requirements. ODIs may be financial or non-financial (reputational) and, for the former, where performance falls below committed levels financial, penalties apply, subject to performance deadbands, caps and collars. For scheme-related ODIs, the monies are returned to customers in the event that the scheme is not delivered or no longer required.
- 2.50 We are materially overspending against our PR14 FD allowance (by over £770m) to deliver and improve the services we provide. This is a significant commitment from our investors. We invested additional funds to meet challenges and address situations, which were not envisaged at the time of the 2014 Price Review, including for example the rapid Freeze-Thaw event in 2018 and the long, hot summer period which followed.

²³ Ibid, See section 2.

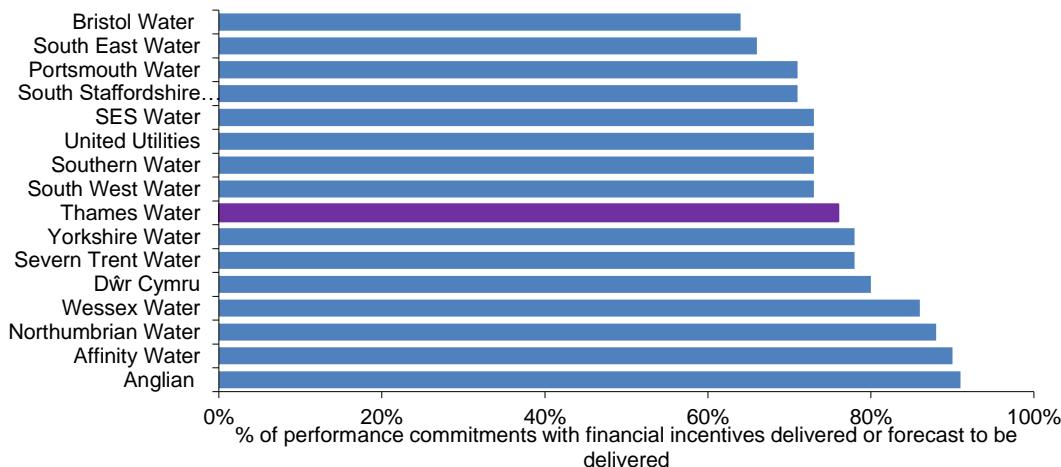
²⁴ Ibid, See section 2, p.21 table 2.1.

²⁵ Source: June Returns 2005-2010 and Annex 3 Supplementary Report to TMS PR09 FD (Ofwat, December 2010).



- 2.51 We acknowledge that £92m of this cost was not efficiently incurred on leakage where some of our innovative solutions adopted to meet our stretching performance commitment proved to be unsuccessful.
- 2.52 Neither our plan, nor Ofwat's view of a notional company at the time of the FD in 2014 was sufficient, in hindsight, to deliver stretching performance improvements in the particular circumstances of the AMP6 period. As set out in our April Submission, we have applied the learning from AMP6 into how we have developed our plan for AMP7.
- 2.53 For the AMP6 period, ODIs and other regulatory mechanisms have been applied to ensure that monies are returned to customers where performance standards have not been reached, or where schemes have not been delivered as envisaged at the time of PR14.
- 2.54 Our April 2019 business plan, May 2019 submission and July 2019 PR14 Reconciliation submission set out the details of our overall performance for AMP6, both with regard to financial and non-financial delivery.
- 2.55 While we accept that our delivery in AMP6 had some shortcomings and we have spent considerably more than the PR14 FD allowance, we remain well within the range of performance across other companies, with performance on PCs with financial incentives well within the pack (8th from 16 companies).

Figure 4: Thames Water PC performance AMP 6 relative to other companies



Source: Ofwat, Initial Assessment of Plans: taken from companies 'test area assessments', % of PCs that companies with financial incentives that companies have or are forecast to achieve in AMP7.

- 2.56 Where we fell short of our performance targets, we have returned the funding to customers. The aspects of our performance in AMP6 are discussed below:
- For the wastewater infrastructure and non-infrastructure service, we assess our asset health as 'Stable' across all years of AMP6 — we have maintained our wastewater assets in line with our performance commitment at PR14;
 - For the water non-infrastructure service, we also assess our asset health as 'Stable' across all years of AMP6 thus maintaining these assets in line with our PR14 performance commitment;



- For the water infrastructure service, we assess our asset health as 'Marginal' across all years of AMP6. We fell just short of our PR14 performance commitment, returning £23m to customers as a consequence;
- We maintained water quality at 99.6% (mean zonal compliance) throughout AMP6, marginally below our 100% PC target, but within the deadband for acceptable performance;
- On supply interruptions (over 4 hours), we expect to achieve our performance commitment of 0.13 hours in the final year of AMP6, but we acknowledge that we missed this target in two years, and, therefore, are returning £15m to our customers under the ODI;
- We acknowledge that we fell short of expectations on leakage, agreeing to undertakings under Section 19 to provide a full compensation package to customers, including returning all of the £92m expenditure incurred inefficiently and making an ex-gratia payment of £7m. This also impacted on SOSI, for which we fell below 100 for three years, and are returning a further £13m to customers;
- We did not meet SEMD targets (£1m); we missed the target to make sites more resilient to extreme rainfall, flooded more customers' properties (internally) (£5m), our STWs failed discharge consent targets (£2m), and we incurred nearly the maximum possible SIM penalty returning £103m to our customers; and
- We delivered a different (better and cheaper) solution to improve resilience to flooding in the Counters Creek catchment, and proposed to return £86m to customers in our April plan via an RCV reduction. Ofwat contend in its DD that we cancelled the project. It included an underperformance penalty of £130m (in 2012/13 prices) for our performance on SB3, and removed the proposed return of the £86m. We disagree with this assessment for the reasons set out in Appendix 15²⁶.

- 2.57 In summary, the evidence from prior regulatory periods shows that we have spent more money than customers have funded us for. We have also shown that we have delivered on the commitments and outputs set out for each price review or returned monies to customers where we have fallen short or where funded outputs (or outcomes) were no longer required through operation of the relevant regulatory mechanisms at the time. Each price determination provided a package of service levels and investment leading us to our overall position at the start of AMP 7 with a below average combined bill at a sector level but with some significant challenges on service.
- 2.58 Thames Water's current position has been determined by allowances and service delivery targets set in previous period reviews and their determinations. These were set by Ofwat and have largely been met or remedies returned to customers where this is not the case through various mechanisms that were again set by Ofwat. Customers have not and would not pay twice. Where Ofwat has chosen to adopt a stronger relative benchmarking approach at PR19, for example on aspects of service performance between Thames and other companies, we don't believe that it should be reasonably assumed to imply that we would or should be in a position now to immediately meet UQ performance on the range of measures Ofwat has set out to 'catch-up' with others. Where Thames Water and other companies have a significant challenge to meet the new targets it is important to reasonably consider the deliverability of those targets given the starting

²⁶

TW-DD-A15: Counters Creek.



position of each company at the end of AMP 6 and also to take reasonable account of any investment that is required to meet those targets.

F Conclusion

2.59 Overall the evidence we present suggests that:

- Ofwat's upper quartile approach may not be reasonable;
- Its justifications for its 'step change' approach appear to be incorrect; and
- The approach does not adequately reflect the fact that the current position of Thames Water is largely a product of previous regulatory settlements; we believe that this starting point needs to be properly reflected.

2.60 As we move towards the Final Determination (FD), in light of this evidence, we ask Ofwat to:

- Recognise the justifications for its 'step change' approach can be challenged and conduct reasonable analysis into the deliverability of its package of measures in the round by the sector and individual companies including in particular the ability of companies to meet such a wide range of stretching upper quartile efficiency and service improvement targets and at such a rapid pace; and
- Adopt a more proportionate level of regulatory challenge that reflects the position of a notional company, at the very least it should ensure that the FD is financeable in line with its statutory duty.

2.61 Further, we ask Ofwat to:

- Soften its overall step change approach to a level of productivity improvement that is challenging but achievable including:
 - Increasing the allowed totex from the DD in line with our concerns in relation to its cost assessment approach at the FD (see Chapter 5 on costs);
 - Accepting the changes to the package of PCs and ODIs that we have set out (see Chapter 8 on outcomes); and
 - Ensuring that the FD is financeable (see Chapter 4 on financeability).



Chapter 3

Ofwat's productivity shift appears unreasonable

A Introduction

- 3.1 In this chapter, we attempt to compile the total implied productivity shift from our actual position in 2019/20 to the position implied in the DD based on a calculation of the implied efficiency derived from the allowed totex in the DD and the costs associated with meeting the PC targets.
- 3.2 Finally we compare the rates of productivity improvement implied by the DD to those observed in other regulated and competitive asset intensive industries. In making this comparison we use the examples cited in Ofwat's own advisor reports.
- 3.3 The evidence demonstrates that the overall level of productivity shift implied by the DD is greater than that observed in competitive environments following major structural changes or shocks. This raises questions around whether the approach is reasonable and achievable.
- 3.4 We discuss each of these areas in the following sections:
 - **Section B:** Understanding the level of stretch in the DD;
 - **Section C:** Calculating the level of productivity improvement required to deliver the DD;
 - **Section D:** Benchmarking that rate of improvement; and
 - **Section E:** The absence of transition arrangements.
- 3.5 While **Section F** concludes.

B Understanding the level of stretch in the DD

- 3.6 Ofwat has chosen to significantly amend the package of measures for Thames Water, compared to the IAP. The table below set out the key elements of the price control, comparing the DD with the already tough IAP.

**Table 2: Comparison of DD and IAP for key elements of Thames Water's PR19 price control**

Item	Unit	IAP (2024/25)	DD (2024/25)	Delta
Totex (AMP total)	£m (2017/18 prices)	9,421	9,263	-158
Leakage*	ML/day	509	477	-32
PCC	L/prop/day	136	133	-3
Supply interruptions	HH:MM:SS	00:03:00	00:03:00	00:00:00
Intern. sewer flooding	N/10k prop	1.3	1.3	0.0
Mains repairs	N/1k km mains	281	231	-50
Pollutions	N/10 km mains	19.5	19.5	0.0
Sewer collapses	N/10 km mains	4.0	4.0	0.0
Unplanned outage	% peak week capacity	0.17	0.02	-0.15
Blockages	N	65,000	62,500	-2,500
Voids	% of HH prop	3.6	3.0	-0.6

Source: Ofwat's IAP and DD documents; * MI/d AMP6 annual average methodology.

- 3.7 In September 2018, we produced a business plan that addressed the necessary investment in our operation for AMP7 and featured a stretching 13.6% reduction in average unit base opex per customer. The same business plan also contained some significant service improvement rates across a wide range of performance metrics, many of which were more stretching than historical improvement rates.
- 3.8 On 1 April 2019, we submitted 99 documents, including a significantly revised business plan, which featured an extremely stretching opex reduction of £400m, further than the September plan, which amounted to a 22.5% reduction in average unit base opex per customer. Our April plan also featured a £370m reduction in headline totex from enhancement efficiency, deferring and descoping and through the use of uncertainty mechanisms. We also increased some of our performance commitments including for example on pollutions, supply interruptions and internal sewer flooding.
- 3.9 In developing these productivity improvements we sought to engage positively with Ofwat's PR19 process and we explicitly considered the achievability and the deliverability of them and the overall plans. We would not have put forward estimates which we considered were undeliverable. It is unclear how this evidence has been taken into account and also how Ofwat has convinced itself that the DD is reasonable and achievable.
- 3.10 The DD represents a significant shift in expectations from our current performance. The following table sets out some of the key expectations for elements on the price control, comparing 2019/20 actual performance with 2024/25 expected PR19 performance, the rate of improvement required and the comparative average improvement rates for other large water and sewerage companies during the 2015-20 period to date. The service measures presented are a very minor subset of the overall PCs (just four PCs are presented from our total package).



Table 3: Comparison of selected DD expected performance (2024/25) and current performance (2019/20) and required rates of improvement

Item	Unit	Current performance (2019/20 forecast)	DD expected performance (2024/25)	% change required	Average historical % PC improvement
Totex (AMP total)	£m (2017/18 prices)	10,063	9,263	8%	N/A
Leakage ¹	ML/day	636	477	25%	- 8% ²
Supply interruptions	HH:MM:SS	00:10:35	00:03:00	72%	-23% ³
Internal sewer flooding	N/10k prop	2.1	1.3	38%	42% ³
Pollutions	N/10 km mains	28.0	19.5	30%	9% ³

Source: Ofwat's DD documents; Thames Water calculations.

¹ ML/d AMP6 annual average methodology.

² 2012-2017 data source: Ofwat Wholesale Water dataset (2018) (data for years 2012 – 2017).

³ Discover Water website (22/08/2019) (data for period 2016 – 2018).

- 3.11 The table shows that the improvement rates for many of the PCs are significantly above the average rate of improvement for the sector in AMP 6 with the exception of internal sewer flooding.
- 3.12 We are concerned that in Ofwat's DD documents, the scale of the gap between our current performance and the DD's expected position is not acknowledged or explained. It is unclear that Ofwat has adequately considered the rate of improvement across all these measures and the extent to which the overall package is deliverable. Ofwat, in line with its statutory duties, may seek to set an overall price control package which is challenging, efficient and in customers' interests but that the package does need to be deliverable.

C Calculating the level of productivity improvement required to deliver the DD

- 3.13 Ofwat's overall PR19 approach to setting cost allowances and required service levels for the 2020-25 period looks at costs and service levels separately. Allowed base totex is set according to an industry upper quartile efficiency benchmark using a series of econometric cost models and Ofwat also applies a 1.5% p.a. rate for frontier shift²⁷. For setting service levels, a range of different service performance or 'outcome' targets are derived based on a variety of forward looking upper quartile cross industry benchmarks.
- 3.14 In estimating the level of productivity improvement required we define productivity as the amount of cost or totex input that is needed to deliver a given level of output or capacity and service quality. Where we are required to deliver either the same base outputs against a significant reduction in our allowed totex input or a significant increase in outputs, for example an increase in capacity through growth or quality through improved service performance, without any corresponding increase in totex inputs this will amount to a degree of productivity improvement.
- 3.15 We are concerned that Ofwat may have looked at these measures in isolation as it has considered the complete package of measures in PR19 – because each of Ofwat's decisions has an impact on our required productivity improvement. Therefore, we have surveyed the DD's

²⁷ In the DD Ofwat has also included an allowance for Real Price Effects for labour but a 'true-up' mechanism is proposed at the end of AMP 7 to account for the difference.



complete package of measures and have identified where the DD requires a degree of productivity improvement.

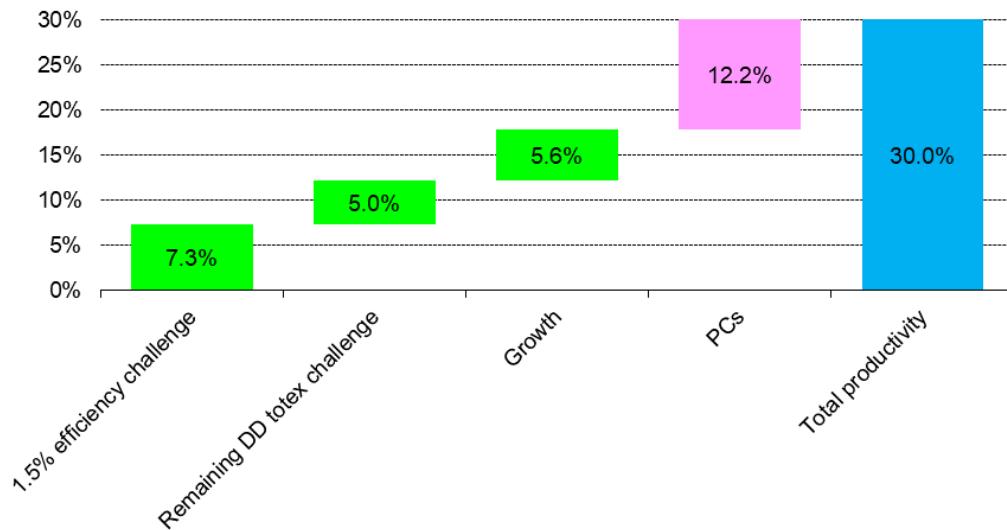
- 3.16 Further, we are concerned that Ofwat may not have taken into account the productivity shift from our current position. Our concern with understanding the total productivity shift, from our current position is to understand whether the shift is achievable and further, in this regard, whether the DD is a plan to succeed or whether it turns out to be a plan for failure – which we do not believe is in customers' interests. We have therefore based our analysis of the degree of productivity improvement on our expected current 2019/20 costs and service levels.
- 3.17 We have considered each of the areas of the price control which would require stretching performance and undertaken some simple analysis to provide an indicative view of the overall level of productivity improvement required. In developing these estimates, we have compared them to our expected starting point at the end of AMP 6 (2019/20 expenditure, network capacity and levels of performance).
- 3.18 The key material aspects of this are likely to include:
- **Direct totex productivity:**
 - **'Frontier shift' productivity improvement of 1.5% p.a.:** We discuss this calculation in Chapter 5, but Ofwat's policy position is to expect increased outputs for less totex, through a combination of frontier shift efficiency and companies making use of the flexibility provided by the outcomes and totex reforms to the regulatory framework. Based on this Ofwat assumes a 1.5% per annum efficiency can be achieved against the base costs from the Ofwat models;
 - **Remaining DD totex challenge:** In the DD Ofwat is proposing to materially reduce our annual allowed totex from current 2019/20 levels. Ofwat's DD would require efficiencies as a result of benchmarking Thames Water using a series of econometric models and comparing our performance to the upper quartile industry benchmark on base costs. It is also challenging enhancement expenditure proposals according to a mixture of simpler unit cost models and 'shallow' and 'deep dives' of company enhancement cases. Where allowed costs are being reduced for the same 'base' level of output or service or enhancement costs are subject to an efficiency challenge, this equates to a productivity improvement. We discuss the detailed assessment of costs in Chapter 5;
 - **Growth:** Our area of appointment contains London and the surrounding areas, as such we expect to continue to experience substantial growth in demand for water and wastewater services with a corresponding impact on the capacity of our network. Growth can take a number of different forms including increasing numbers of connections to our network but also growth in the network itself to handle new capacity, for example increasing the capacity of treatment works. In our business plan we set out the expenditure that we considered was required to meet growth in our area. Ensuring we can meet this growth in our network requires a productivity improvement from our current position; and
 - **Performance Commitments (PCs) or service improvements:** The DD has stretched the expected targets for our package of PCs (both common and company-specific PCs) and, as previously described, Ofwat's stated policy is that the funding for the shift from current performance levels to the expected target should generally come from base



expenditure. Therefore, the improvement required to meet this increased performance also implies a shift in productivity.

- 3.19 The figure below shows the total 5 year shift in productivity, denominated in totex, calculated from our current position in 2019/20 compared to the position by the end of AMP7 in 2024/25.

Figure 5: Total implied productivity shift from 2019/20 to the end of AMP7



Source: Ofwat's DD; Thames Water calculation

- 3.20 We are concerned that over the 5 year period, Ofwat is expecting Thames Water to increase productivity by an order of magnitude in the region of 30%. Direct totex productivity from Ofwat's figures reveal a shift of 18% and the cost to Thames of reaching target PC levels would amount to a 12% shift.
- 3.21 The table below describes how we have calculated each of the areas of productivity improvement for this analysis.

**Table 4: Description of approach to analysis of productivity improvement**

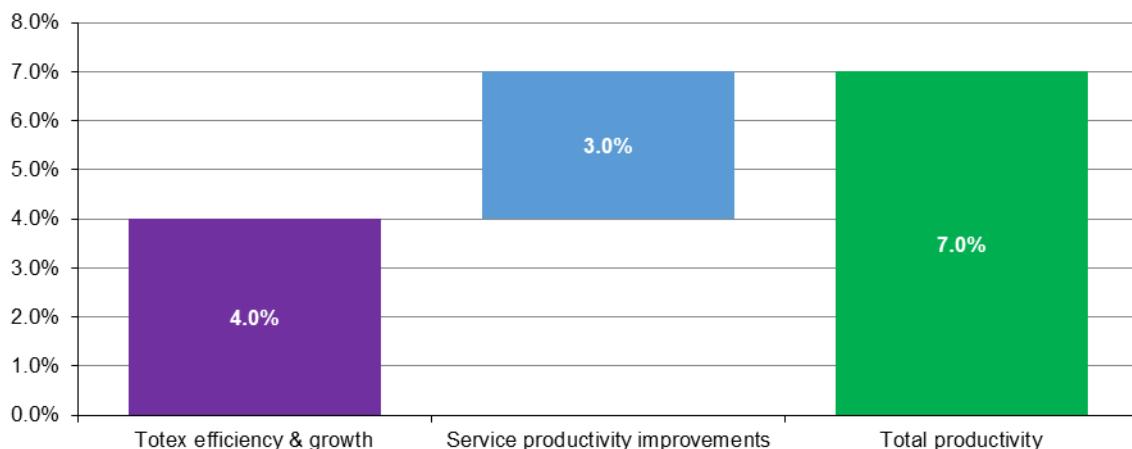
Productivity improvement areas	Description
Frontier shift improvement of 1.5% p.a.	<ul style="list-style-type: none"> Ofwat assumes that companies will achieve a frontier shift efficiency improvement over AMP 7 of 1.5% per annum against their efficient base cost model allowances. This is driven by a combination of a traditional frontier shift productivity improvement element and an additional efficiency opportunity created by the flexibility derived from the outcomes and totex framework. We have taken 1.5% of annual efficiencies from our 2019/20 totex figures.
Remaining DD totex challenge	<ul style="list-style-type: none"> After the frontier shift and growth productivity improvements are accounted for there remains a significant residual efficiency gap between our 2019/20 totex and the allowances proposed in the DD. This is likely to be made up of a number of different factors, but in large part it will be accounted for by the base 'catch-up' efficiency applied by the Ofwat models between Thames and the upper quartile level of totex in these models.
Growth	<ul style="list-style-type: none"> Companies have been required to set out in their business plans the estimated totex required to meet growth in their areas of appointment. This 'growth' expenditure can take the form of certain 'one-off' costs, for example associated with connecting new properties to the network, or ongoing costs associated with managing a larger network, for example increasing the capacity of treatment works, etc. In calculating the scale of productivity improvement we have taken the total expenditure for growth from our business plan scenario, but excluded the 'one-off' cost elements associated with new connections, as there will be some cost for new connections in the 2019/20 starting figures. However, the costs associated with operating and maintaining a larger network would represent the required productivity improvement.
PC or service improvements	<ul style="list-style-type: none"> At PR14 Ofwat has set 14 common performance commitments for different aspects of service that companies have been required to deliver in AMP 7. For many of these PCs Ofwat has required companies to meet the UQ performance level in 2024-5 based on companies' business plan projections. Ofwat's policy position is that improvements in service performance to hit this UQ level should be funded through base costs. Ofwat has generally not allowed any additional costs to meet these service levels. Where we are required to increase service levels across AMP 7 without any additional investment, this implies a productivity improvement. To calculate the productivity improvement we obtain the assumed costs of meeting a required service level and calculate a unit rate of improvement. That unit rate is then applied to the required rate of PC improvement to calculate a level of productivity improvement. We have not calculated the scale of productivity improvement for all PCs, but have instead focussed on a small subset including mains repairs, supply interruptions, leakage, internal sewer flooding, PCC and pollutions.

- 3.22 This analysis has been undertaken rapidly in the very short timeframes that Ofwat has allowed to respond to the DD and we may do further work in this area ahead of the FD. We recognise that there are a number of limitations with this analysis.
- The current 2019-20 totex figure includes both base expenditure and less predictable enhancement expenditure, this could inflate the starting point for our productivity analysis somewhat, however, examining the allowed enhancement in the DD the profile looks comparable, we consider that this effect is likely to be minimal; and
 - While there is a relationship between investment and service improvement we recognise that it may be more complex than is currently captured by our relatively simple unit rate analysis.
- 3.23 However, there are also a number of factors that suggest that the analysis could significantly underestimate the level of productivity improvement required:
- The assumed productivity improvement required to meet the stretching UQ performance levels is only calculated for a very small sub-set of the PCs, there are many other PCs where we have not calculated the performance improvement rates; and



- Our analysis does not include the impacts of incentive mechanisms like C-MeX or the GSM, which we calculate would add a further 3% of productivity improvement.
- 3.24 While we recognise that there are some limitations with this analysis we believe it represents a reasonable basis for describing the level of challenge arising from the DD.
- 3.25 On average across the 5 years of AMP7, the DD expects Thames to achieve an 7% annual productivity gain per year. Further, the impact of this expectation starts straight away. The individual productivity shift between 2019/20 and 2020/21 could be materially higher, given the step changes in performance commitments, compared to the 2019/20 level.

Figure 6: Total implied annual productivity shift from 2019/20 to the end of AMP7



Source: Thames Water analysis of Ofwat's PR19 Draft Determination versus our 2019/20 position.

D The DD's productivity shift is not achievable in comparison to other benchmarks

- 3.26 The 30% total productivity shift over 5 years from our current position is a significant challenge. We are concerned that this challenge is not achievable. We do not want the FD to be a plan for failure, rather than a realistic (if challenging) package of measures.

Comparing the levels of productivity improvement implied by the DD with other sector benchmarks

- 3.27 In seeking to ascertain whether the DD represents an achievable level of productivity shift we have compared our productivity shift estimates with some benchmarks from other sectors.



- 3.28 In 2017 Frontier Economics completed a study for Water UK²⁸ examining productivity improvement in the water and sewerage industry in England since privatisation. That study also examined a range of comparator sectors using the EU KLEMS dataset²⁹. Those comparator sectors were chosen for a range of reasons, including the extent to which those sectors:
- Carry out comparable activities to water companies;
 - Have a similar mix of opex and capex in the production process;
 - Have experienced similar economic and/or regulatory conditions; and
 - Have been considered as relevant comparators for large regulated infrastructure utilities in previous studies commissioned by regulators or Water UK.
- 3.29 In 2017, Ofwat asked KPMG and aqua consultants³⁰ to review the potential scope for productivity shift in AMP 7 including any impacts from the regulatory changes associated with the impact of the totex and outcomes frameworks. As part of this study a range of examples of the impact of structural and regulatory changes on efficiency were examined as a 'cross check' on the results. Specifically these examples looked at changes in Real Unit Operating Expenditure (RUOE) in a range of other capital intensive infrastructure sectors following specific structural changes (for example structural separations, changes in ownership, moving from monopoly to competitive markets, etc).
- 3.30 Precedents from these two studies can be compared to the level of productivity improvement that Ofwat is proposing to provide a cross-check as to whether the overall level of productivity improvement implied by the DD is achievable. To undertake this comparison we first consider the totex and growth productivity improvement and then separately consider the inclusion of service.

Totex and growth productivity improvements

- 3.31 In the chart below we compare the totex and growth productivity improvements against selected benchmarks from these other studies. In particular we compare totex and growth productivity improvements taken from our own analysis of the DD only (excluding service or quality enhancements) with the average benchmarks from the Frontier study³¹ for the three business cycle periods considered and the maximum annual improvement from all sectors examined and all business cycles (Telecommunications during the 1994-2008 period). We also compare with the average and maximum annual productivity improvement rates for the selected structural and regulatory changes from the KPMG and aqua consultants' report³².

²⁸ Frontier Economics, 2017, 'Productivity improvement in the water and sewerage industry in England since privatisation', p.33.

²⁹ See: <http://www.euklems.net/>

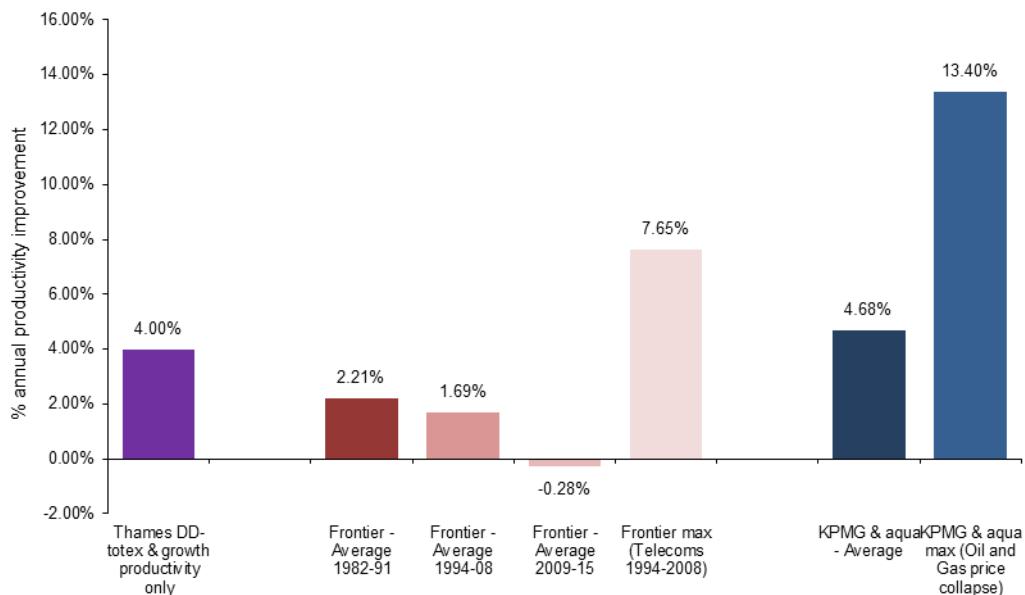
³⁰ KPMG and aqua consultants, 2018, Innovation and efficiency gains from the totex and outcomes framework.

³¹ Frontier Economics, 2017, 'Productivity improvement in the water and sewerage industry in England since privatisation', p.31.

³² KPMG and aqua consultants, 2018, Innovation and efficiency gains from the totex and outcomes framework, p.17.



Figure 7: Benchmarking totex and growth productivity improvements from the DD against other sectors



Source: Thames analysis of Ofwat DD, other figures taken from Frontier Economics (figure 20) and KPMG and aqua consultants (Table 5) reports.

3.32 From the comparison we make the following observations:

- The level of productivity improvement that Ofwat is seeking from Thames in its DD on the totex and growth elements of our productivity calculation alone is materially higher than the average across all the comparator sectors observed in the Frontier economics report and across all three of the observed business cycles;
- When the most recent (post GFC) business cycles are used (i.e. 2009-15), the difference in the levels of productivity improvement is most significant, with the Ofwat DD seeking a 4% productivity improvement compared to -0.28% from comparator sectors. This supports the broader experience that productivity in the wider economy has collapsed since the GFC;
- The level of productivity improvement that Ofwat is seeking from totex and growth is substantially lower than the maximum observed in the Frontier report, 7.65% per annum for the Telecommunications sector in 1994-2008;
- The level of productivity improvement that Ofwat is seeking from Thames in its DD on the totex and growth elements of our productivity calculation alone (4%) is slightly below the average of 4.68% observed in the KPMG and aqua consultants' report and across all the structural and regulatory changes; and
- The level of productivity improvement is substantially below the maximum observed in the precedents from that study, which was the oil and gas sector following the collapse of the oil price (13.4%).



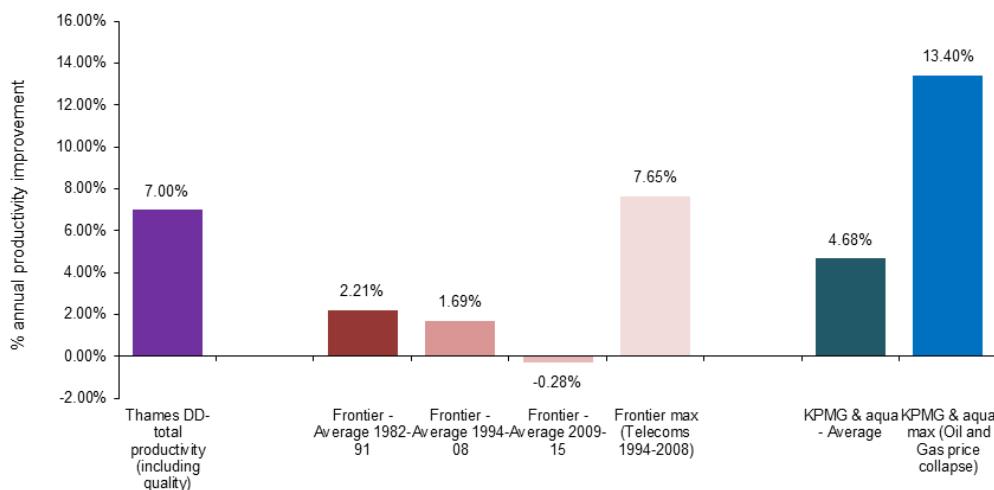
Total productivity improvements including totex, growth and service or PC enhancements

- 3.33 The chart below provides the same comparisons but the service improvement elements of our productivity improvement calculation are also included. We note earlier in this chapter that the service improvement elements of our productivity shift calculation are more difficult to quantify.
- 3.34 In making comparisons with the benchmarks from these other reports we note that in their report, Frontier economics consider that their benchmarks should be compared to productivity improvement elements that take account of quality.

"We present the results of the productivity estimates from EU KLEMS compared to both the quality adjusted and quality unadjusted results from our study. However, in our view it is more appropriate to compare the EU KLEMS series to the quality adjusted measures from our study. This is because the real output measures to which the EU KLEMS methodology is applied are derived in a manner that takes account of the effect of quality changes on prices."³³

- 3.35 We also note that the KPMG and aqua consultants' report is only a comparison of productivity improvements arising from cost efficiencies or reductions in Real Unit Operating Expenditure and hence generally do not include service improvements.

Figure 8: Benchmarking the overall productivity improvements from the DD against other sectors



Source: Thames analysis of Ofwat DD, other figures taken from Frontier Economics (figure 20) and KPMG and aqua consultants (Table 5) reports.

- 3.36 From the comparison we make the following observations:
- The level of productivity improvement that Ofwat is seeking from Thames Water in its DD once service quality improvement is included is materially higher than all of the benchmarks from the Frontier economics report and across all three of the observed business cycles and all sectors except Telecommunications in the 1994-2008 period which is just above the level sought (7.65%); and
 - The level of productivity improvement that Ofwat is seeking from Thames Water in its DD overall including service quality enhancements (7% per annum) is materially higher than to

³³ Frontier Economics, 2017, 'Productivity improvement in the water and sewerage industry in England since privatisation', p.28.



the average of 4.68% observed in the KPMG and aqua consultants' report and across most of the structural and regulatory changes but below the maximum of that report for the Oil and Gas sector following the collapse of the oil price.

Conclusions from comparative benchmarking

- 3.37 The comparative benchmarking demonstrates how demanding a position Ofwat has taken in its DD assessment for Thames Water and how difficult it is to consider that this is achievable.
- 3.38 Even without an assessment of service quality, the level of productivity improvement required by Ofwat is materially beyond that observed in comparative benchmark sectors in the economy from the Frontier economics report. Many of the benchmark sectors used in this comparison are competitive industries, which Ofwat reports that it is seeking to 'mimic' through its price setting approach in line with its statutory duty to protect customers including by promoting competition.
- 3.39 This comparison is even more pronounced when the most recent post-GFC business cycles are examined, this cycle is the most relevant to this comparison and shows how productivity in the wider economy has collapsed post-GFC. The water sector is not immune from this wider trend.
- 3.40 Once service quality is included, even if the assessment of service quality was overstated in our analysis, Ofwat is seeking a level of ongoing productivity improvement from Thames in the DD that is comparable to that observed in the Telecommunications sector in 1994-2008 period. Clearly the telecoms sector is one that exhibits substantially more technological change and dynamic efficiency than the water sector and is subject to a much larger level of competitive pressure. This does not seem to us to be a credible position.
- 3.41 The overall level of productivity improvement is also higher than the examples of significant structural and regulatory change cited in the KPMG and aqua consultants' report, albeit that these exclude service or quality enhancements. These examples have actually been selected by those consultants as examples of more significant structural changes that would drive material productivity improvements. It is not clear that the PR19 framework provides a suitable comparative benchmark to the level of change observed in these benchmarks. Indeed in their report KPMG and aqua consultants note that:

"it is difficult to infer strong conclusions from this comparative analysis, given the different nature of the cases (events) considered"³⁴.

- 3.42 Only the example of the oil price collapse on the oil and gas sector provides a comparative benchmark materially higher than our own assessment of the level of annual productivity improvement provided by the DD. In that example oil and gas companies, which operate in a competitive environment, were able to substantially reduce production and output to respond to the oil price collapse. As a provider of essential water and wastewater services Thames Water is not able to reduce its output and must maintain services to customers. In fact, we should reasonably expect the oil and gas example to show a materially higher level of productivity improvement than the DD. This again illustrates that the position is not credible.

³⁴

KPMG and aqua consultants, 2018, Innovation and efficiency gains from the totex and outcomes framework, p.18.



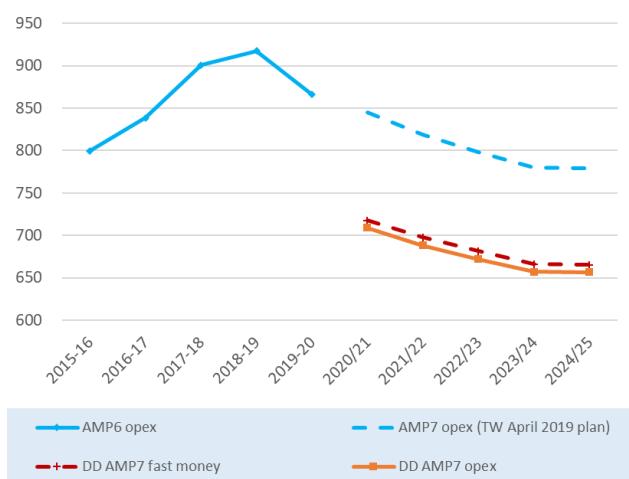
E The absence of transition arrangements

- 3.43 We trust that the productivity improvement analysis provides a helpful indication of the overall level of improvement driven by the DD. A further important feature of Ofwat's DD and approach to PR19 is the absence of appropriate glide-paths and arrangements to enable the package to be reasonably delivered. The change to a new level of totex is assumed to apply from the start of AMP 7, in just seven months' time. Similarly, Ofwat has set service performance targets based on an UQ benchmark across companies, based on their PC target forecasts and, with some minor exceptions such as supply interruptions, without any glide-paths.
- 3.44 In order to further illustrate the scale of the change required, below we examine the change in operating expenditure that would be required by the DD.

Changes in operating expenditure

- 3.45 When considering the deliverability of the DD it is particularly instructive to look at the change in operating expenditure. Delivering rapid reductions in operating expenditure can be considered particularly challenging as adjusting this expenditure will typically involve material reductions in staffing and other operating costs. Indeed, in assessing operating efficiency in less capital intensive businesses regulators often look specifically at labour costs.
- 3.46 In order to compare changes in operating expenditure, we have taken the allowed opex from the DD and the profile as stated in the financial model. We have then compared this figure with our current expected level of operating expenditure for 2019/20. The chart below shows the rate of change required compared to our actual AMP6 opex.

Figure 9: Comparison of operating expenditure (£m) from 'fast money' in the DD versus current AMP 6 spend and TW April business plan (2017/18 CPIH prices)



Source: Thames analysis of Ofwat DD.

- 3.47 We set out our concerns of Ofwat's cost assessment approach in Chapter 5 including why we consider that the cost allowances need to be revisited. However, the chart shows that to meet the DD Thames Water would need to find a 17% reduction in opex in a seven month period and compared to the current level of spend the required rate of change is very stark. Again, in comparison to the benchmarks, we do not believe that this represents a credible position and it



is not clear that Ofwat has considered the deliverability of its top-down assessment of cost. We note that the KPMG and aqua consultants' benchmarks are examples of Real Unit Operating Expenditure reductions and so represent similar examples of operating cost reductions. Examining these benchmarks Ofwat is seeking a level of operating cost efficiency which would be materially higher than can be observed in any of these benchmarks.

- 3.48 The absence of any real assessment of the required rate of improvement to meet the DD that is being imposed by Ofwat we consider represents an error and further analysis of the deliverability of these plans by Ofwat ahead of the FD would be particularly helpful.

The absence of any transitional arrangements

- 3.49 The challenge of the DD is particularly influenced by the absence of any transition plan for meeting the new levels of totex and service that are required by the DD. Even if we considered the DD settlement to be reasonable, there would need to be time given to adjust to the new settlement and there has been no real warning given. For this reason there is a long history of regulators applying glide-paths or transitional arrangements to allow capital intensive infrastructure businesses to adjust, for example Ofwat applied glide-paths to the retail price controls at PR14 and also applied glide paths to operating expenditure at PR09. In PR19 Ofwat has applied a glide path to the Supply Interruptions PC targets.
- 3.50 Ofwat has provided very little warning of the level of cost challenge provided in the DD and has not allowed any transition to the new level of the plan. We would encourage Ofwat to reconsider this position in the final determination.

F Conclusion

- 3.51 The evidence presented shows that:
- The overall level of productivity shift implied by the draft determination is greater than that observed in comparable environments or even examples following major structural changes or shocks. We therefore consider the approach to be unreasonable and unachievable setting Thames (and the wider sector) up for failure which we don't believe would be in customers' interests; and
 - The rate of improvement in particular the transition into the first year of the price control period also appears to be unachievable.
- 3.52 In response to this evidence we hope that Ofwat will:
- Reconsider the overall package of the DD in light of our specific challenges around totex - see Chapter 5 and service outcomes - see Chapter 8; and
 - Undertake further analysis of the deliverability of its interventions in the business plan. In particular Ofwat should consider whether the overall challenge to costs and service improvement is deliverable against the profile of change implied by its determinations.



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Chapter 4

The DD is not financeable

A Introduction

- 4.1 In this Chapter, we demonstrate that the DD is not financeable, and is unlikely to attract new equity. We discuss:
- **Section B:** Ofwat has a duty to ensure financeability;
 - **Section C:** The DD does not balance risk and reward;
 - **Section D:** The implications of the DD not being financeable; and
 - **Section E:** New equity is unlikely.
- 4.2 In the DD document, Ofwat requested that we provide:
- "additional Board assurance that it will remain financeable in 2020-25 on both the actual and notional company structure in the context of interventions in our draft determination and reasonably foreseeable range of plausible outcomes of its final determination."³⁵*
- 4.3 We have conducted a financeability assessment of the DD, and this assessment is described in this Chapter. We have assessed financeability on both actual and notional bases.

B Ofwat has a duty to ensure financeability

- 4.4 Ofwat has a statutory duty to carry out its functions to:
- "secure that water companies can (in particular through securing reasonable returns on their capital) finance the proper carrying out of their statutory functions"³⁶*
- 4.5 We believe that this duty requires Ofwat to assess and to secure a PR19 price control package of measures that allows Thames Water to finance its statutory functions – both on a notional basis, but also on an actual, real-world basis, that takes into account impact of the DD and likely availability of equity in the context of both the DD and exogenous factors.

C The DD does not balance risk and reward

- 4.6 The DD needs to be viewed as a package of measures. Ofwat has set multiple incentives on the company to achieve totex allowances, PC outcomes and Ofwat's choice of gearing. Such incentives need to give Thames Water, and Ofwat's notionally efficient company, a realistic chance of both achieving the desired outcome, as well as securing a reasonable return for

³⁵ PR19 draft determinations. Thames Water – Aligning risk and return actions and interventions, Ofwat (July 2019) – action TMS.RR.A2 (page 2).

³⁶ Section 2, Water Industry Act 1991.



shareholders. The cost of capital calculation should take into account the risk taken by shareholders for both owning UK water assets and the risk inherent in the PR19 incentives.

- 4.7 In order to be financeable, the actual and notional company must be able to deliver the combination of totex and PCs included in the DD on a P50 basis, and have a P50 likelihood of neutrality on the other DD incentives (i.e. no penalty or reward). As set out in Chapter 3 we conclude that the productivity shift implied by the DD of c.30% is neither achievable nor realistic compared to external benchmarks. We consider the impact on financeability of each of the key elements of the price control in turn:

- **Totex allowances:** The DD's allowances at £9.26bn represent a significant reduction in actual totex spending from the current AMP at £10.1bn. In the previous Chapter, we outlined the direct totex productivity shift of 18% for AMP7. Given the size of the totex reduction, and lack of appropriate transition, it is unrealistic to expect that we would be able to reduce our totex spend sufficiently to meet these expectations. On such an overspend, given the totex sharing rates, our key credit metrics would be significantly impacted. In such a scenario, we cannot expect to benefit from the potential of underspending against our DD totex allowances, which would have a positive impact on metrics;
- **PCs:** The DD expected PC values and ODI penalty rates for some PCs represent a significant increase in outputs, together with a higher financial risk impact if the PC par value is not achieved. Given the stretch to reach par from our current position, we do not expect to reach reward status on any of the common PCs. In the previous Chapter, we showed that the productivity shift related to the DD's PC targets represented a 12% shift, where we would need to increase totex spend to reach the targets. Such an increase is not included in the DD's totex allowances and hence would have a material impact on credit ratios;
- **Assumed penalties:** In the last Chapter, we highlighted that our assessment of the productivity challenge excluded the impacts of incentive mechanisms such as C-MeX and the GSM – these will also adversely impact on returns in practice, given the relative scoring structure of C-MeX and that actual gearing will remain above Ofwat's chosen threshold; and
- **Downside skew risk:** Further, the significant downside risk we see for Thames Water is also apparent across Ofwat's DDs for each of the companies in significant scrutiny and slow track categories. Ofwat's DD analysis states³⁷ that the average ODI range in the DD is -2.6% to +0.6%, and the overall RORE range for companies in the DD is -5.1% to +2.7%³⁸. Given this downside skew, we can only conclude that the risk of a negative impact on our credit profile is greater than the opportunity for outperformance and reward. Further assessment of downside skew is set out in Chapter 6.

- 4.8 Given this negative outlook, our central expectation for the DD's package of measures would not generate sufficient returns to enable us to recover the cost of capital. Therefore, the DD represents a higher risk outcome that is not in customers interests, as much needed investment and improvement in resilience and service could not be funded.

³⁷ PR19 draft determinations: Aligning risk and return technical appendix, Ofwat (July 2019) – pages 17-21.

³⁸ This RORE range figure differs slightly from the industry averages presented in Ofwat summary documents, being based on the individual company ranges set out in the Ofwat company specific determinations, weighted by current RCV values.



- 4.9 Given the negative outlook of the central expectation of the DD, and the significant downside risk and downside skew noted above, then we must also conclude that the DD would not be resilient to a range of further severe, reasonable and plausible scenarios, such as those common scenarios relating to inflation, bad debt, refinancing, and penalties – in addition to downside totex and ODI outcomes – which Ofwat sets out in its position statement on PR19 business plans³⁹.
- 4.10 A higher risk outcome could be balanced by a corresponding WACC return. The only way that too low a level of totex and too stretching a level of service could be addressed is by setting the WACC so high as to allow excess profits. Ofwat's DD included the first analysis since Ofwat's 'early view', which had set the industry cost of capital at 2.4% (RPI-stripped) for the appointed business. This was a reduction of 134 basis points from the PR14 cost of capital at 3.74% (appointed, RPI-stripped). The DD set the industry cost of capital 21 basis points lower than the early view at 2.19% (appointed, RPI-stripped). At this rate of return, it is not clear how Ofwat has balanced the increased risk inherent in the DD. Ofwat's bottom-up estimate of the WACC provides a backward-looking view of the risk of the sector. To the extent that the risk profile looking ahead is different to the past, the estimate of the WACC will be inappropriate. We explore this issue further within Chapter 6.
- 4.11 Therefore, on an actual basis, we are forced to conclude that the DD's package of measures does not allow Thames Water to finance our statutory functions and hence is not financeable. The driver for this conclusion is the unrealistic package of totex, ODIs and incentives within Ofwat's DD – which we have demonstrated to be unsupported by external benchmarks – not our choice of capital structure.
- 4.12 On a notional basis, assuming Ofwat's 60% gearing level, we draw similar conclusions. Ofwat's interpretation of its financing duty is that an "efficient company" can finance the proper carrying out of its functions, in particular by securing reasonable returns on its capital. It is of fundamental importance that the assumptions Ofwat makes for the "efficient" company are reasonable – otherwise it will not be able to meet its duty.
- 4.13 For the reasons noted above regarding the unrealistic extent of the implied productivity shift in the DD (of c.30%), we do not consider that the assumptions which Ofwat makes in its DD for Thames Water present a reasonable combination of totex allowances, PC levels, ODI rates and other incentives. It would therefore be unreasonable to expect that a notionally efficient company could deliver the unrealistically stretching PCs for the totex it is allowed in the DD. It would inevitably overspend its totex allowances to meet its PCs and/or incur significant ODI penalties if it sought to constrain its totex to the DD level.
- 4.14 The impact of incurring this additional totex and/or penalties would mean that the notional company would not be able to earn its cost of capital and it would therefore not be financeable.
- 4.15 To illustrate this further, we have taken a hypothetical, but realistic scenario, and demonstrate that, even if the notional company was to incur totex 5% above the DD allowance and if its ODI penalties were only £300m, then this would generate a return on capital of 1.5% which is materially below that assumed in the DD WACC of 2.19% on an equivalent RPI-stripped basis.

³⁹ Putting the sector in balance: position statement on PR19 business plans, Ofwat July 2018 – Section 8 Financial Resilience.



- 4.16 Further, if you back out the allowed cost of debt (and we'd expect to underperform this in reality for the reasons noted above) then the implied return on equity in this case would be just 1.7%, which is significantly below the allowed cost of equity in the DD WACC of 3.46%.
- 4.17 The impact of incurring this additional totex and/or penalties would mean that the notional company would not be able to earn its cost of capital, and it would therefore not be financeable. Hence, Ofwat would not fulfil its financeability duties: "*To secure that companies ... are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of those functions.*"
- 4.18 The implied return on equity would also mean that the notional company would be unable to attract new equity, hence reducing the number of available options to resolve its financeability.
- 4.19 Our financial advisor Evercore has independently confirmed that this scenario would not be consistent with Ofwat's primary duty to ensure companies can finance the proper carrying out of their functions, in particular, by securing reasonable returns on their capital⁴⁰.

Implications for financeability assessment

- 4.20 It is standard practice for regulators to undertake a financeability assessment of a proposed determination. For Ofwat, this assessment is relevant for achieving both its financing duty and the new duty to secure long-term resilience.
- 4.21 Ofwat has not applied sufficient 'stress tests' on financeability. The CMA Bristol Water (2015) decision stated that:

"We consider it good regulatory practice to consider the impact of downside shock on financial ratios."
- 4.22 Ofwat appears not to have undertaken any analysis of downside scenarios or 'stress testing' for the assessment of financeability or financial resilience at the Draft Determination. We think this is an important omission, particularly in view of the requirement for companies to consider financial resilience to a range of severe, reasonable and plausible scenarios, such as those common scenarios relating to inflation, bad debt, refinancing, and penalties – in addition to downside totex and ODI outcomes – which Ofwat sets out in its position statement on PR19 business plans⁴¹.
- 4.23 Not only is this inconsistent with good regulatory practice outlined by the CMA but it is also a particular concern given the additional risk factors facing the industry at PR19.
 - The notional assessment (which assumes targets are met) is tighter than at previous controls, with less headroom within the band of investment grade ratings. Ofwat's assessment is more consistent with Baa2⁴² than Baa1 or above;
 - The targets for service performance and cost efficiency are more ambitious than in previous controls. Ofwat considers that they can be met by an efficient company, but the methods used to set the targets are more aggressive. At PR14 the cost allowance was based on upper-quartile assessment, but with no ongoing frontier shift efficiency. At PR19,

⁴⁰ TW-DD-A19 – Financeability opinion of DD.

⁴¹ Putting the sector in balance: position statement on PR19 business plans, Ofwat July 2018 – Section 8 Financial Resilience.

⁴² For example, adjusted interest cover ratio in range 1.3 to 1.5, which is consistent with Baa2.



Ofwat has combined upper-quartile assessment with a frontier shift of 1.5% per annum⁴³ for wholesale and a forward-looking efficiency challenge for retail. For service performance Ofwat has introduced forward looking upper quartile assessment for some common measures, and more generally, has a greater focus on comparative benchmarking and stretching performance targets;

- Penalties for poor performance are more material. The RoRE analysis highlights that there is more downside risk and more downside skew on ODIs; and
 - The regulatory protections for underperformance have been weakened. For example, companies will, on average, have to absorb around 60% of any cost overspend, compared to around 50% at PR14.
- 4.24 Therefore, reasonable scenarios for underperformance on costs and service performance will place material risk on the financial resilience and ability to raise finance on reasonable terms. Ofwat's cost models and methods for setting performance targets are not perfect. This is to be expected, as no regulatory benchmarking method will give perfect results. Ofwat can point to the fact that since privatisation, companies have generally (though not always) met or exceeded the targets set of them. However, at a point where Ofwat will be applying more stringent methods for setting targets than previously, there is clearly a greater risk that the targets turn out to be unrealistic. Given this risk, it is vital to understand the impact of this scenario on the financial position of the companies.
- 4.25 For Bristol Water the CMA considered downside scenarios relating to overspend of totex. This resulted in worsening credit metrics, but the CMA identified three factors as protecting the company finances in the event of the downside scenario:
- **The headroom in credit rating above the floor of investment grade:** This factor is weakened at PR19 with the metrics consistent with a lower rating than previously;
 - **The 50% cost sharing rate for totex overspends:** This is also weakened with companies taking 60% of the risk on overspend; and
 - **The option to raise new equity:** This factor is untested, but there are reasons to consider that the sector is less attractive to equity investors than at PR14.
- 4.26 The fact that Ofwat has not undertaken stress-testing of the financeability position and in particular attempted to assess the impact of the higher risk profile that companies are exposed to at PR19 is an important omission. In our view it would be relevant to an assessment of whether Ofwat has satisfied both its financing duty and its resilience duty.

D The implications of the DD not being financeable

- 4.27 A company which is not financeable is one which:
- Cannot earn a return at least equal to the reasonable cost of capital; and
 - Cannot raise finance on reasonable terms⁴⁴.

⁴³ PR19 draft determinations: Securing cost efficiency technical appendix, Ofwat (July 2019) – Table 6.

⁴⁴ Based on Ofwat's interpretation of its financing duty set out in 'Delivering Water 2020: Our final methodology for the 2019 price review', Ofwat (December 2014).



- 4.28 The main implications of a company not being able to finance its functions are that investment will not be available for the company to deliver its statutory obligations to provide water and wastewater services to customers now, nor to protect the interest of future customers by maintaining long-term resilience.
- 4.29 Clearly given the conclusion of our analysis, we request Ofwat to undertake its own analysis of both the notional and actual financeability of the DD ahead of the final determination, including consideration of downside scenarios or 'stress testing' when forming its assessment of financeability and financial resilience. Given the implications of non-financeability, we urge Ofwat to take action to alter the risk profile of the final determination, such that we would have the ability to finance our operation with an expectation to provide a fair return and to enable us to finance our debt interest.

E New equity is unlikely

- 4.30 One further important implication of the non-financeability conclusion is that under this risk/return basis of the DD, we do not see a compelling investment case for shareholders to inject further equity into the business especially when such an equity injection would still not lead to a financeable company.
- 4.31 Our current long-term shareholders have injected significant additional equity into the business, supporting the degearing of TWUL by £250m in April 2019. Further, we have decided to retain all equity returns within TWUL by not paying external dividends for the three years 2017/18 to 2019/20 and our April plan commits to further dividend restraint and limited external dividends over the five years to March 2025. The combined effect being to re-invest equity returns back into building operational and financial resilience into the business.
- 4.32 We note that if a company does not receive sufficient allowance to reach upper quartile levels in cost and performance this would imply a need to inject further equity. We can only conclude that this outcome would not be fulfilled under a scenario in which the final determination was not financeable on an actual or a notional basis.
- 4.33 This scenario would also not be consistent with wider government policy to ensure the UK remains a leading destination for international investment⁴⁵.
- 4.34 Equally our analysis calls into question Ofwat's assumption in its test of notional financeability that equity is a credible solution to resolve issues, on the grounds that:
- Net returns in its DD are insufficient for the notional company to attract equity; and
 - There must be significant doubt over the availability of equity funding for water companies in the light of proposals by the Labour Party to renationalise the sector.

⁴⁵

Taken from Objective 2 of the Department for International Trade, Annual Report and Accounts 2018-19.



Chapter 5

Costs

A Introduction

- 5.1 In this Chapter, we explain the gap between the DD and our plans, as we understand it, in order to show the need for a plan for totex that can be achieved realistically. We discuss:
- **Section B:** Ofwat's approach to totex;
 - **Section C:** Choices in Ofwat's modelling;
 - **Section D:** Enhancement cases;
 - **Section E:** Other cost items; and
 - **Section F:** Conclusion.
- 5.2 The overall impact of the points set out in this document are summarised in the table below.

Table 5: Summary of our explanation of the gap between our plan and the DD

Issue	Value (2017/18 prices)
Ofwat's approach to totex	
Choice of benchmark years	£232-£382m
Upper quartile expectations for both totex and outcomes	£255m
Choices in Ofwat's modelling	
Impact of difference between companies on benchmarking	£53m
Allowance for growth	£94m
Real price effects	£14m
Frontier shift	£180m
Retail modelling	£89m
Enhancement and CAC cases	
Other cost items	
Business Rates	£75m
Grants and contributions	£56m
Total	c. £2bn

Note: Enhancement costs only include those required to deliver a 20% reduction in leakage from 636 Mld in 2019/20 to 509 Ml/d by 2024/25.

Source: Thames Water calculation.



B Ofwat's approach to totex

- 5.3 We have a number of concerns about Ofwat's overall approach to totex which explain some of the gap between our plan and the DD. In this section, we discuss:
- Choice of benchmark years; and
 - Upper quartile expectations for both totex and outcomes.

Choice of benchmark years

- 5.4 Ofwat's PR19 econometric models choose to benchmark costs based on 7 years of historic company information from 2011/12 to 2017/18. This approach is different to its choice at PR14, when Ofwat used 5 years of data. This choice was the result of the introduction of a five year smoothing approach adopted for capex which limited the sample period that could be used. The CMA was critical of this approach in its Bristol Water review and used a mixture of 5 and 7 year models in its own cost estimation⁴⁶, in order to demonstrate the stability of parameter estimates.
- 5.5 When we performed similar tests to the models put forward by Ofwat in the DD, some concerns arose.
- 5.6 First, we are concerned that only using a 7 year window, between 2011/12 and 2017/18 will not produce stable results and does not follow the more robust approach adopted by the CMA.
- 5.7 Second, we are concerned that using cost data up to 2017/18, when 2018/19 actual and 2019/20 forecast data is available, could exclude important cost trends from the industry, which need to be taken into account when setting allowances from 2020/21 onward.
- 5.8 We have modelled the base totex allowances for Thames Water using alternative modelling year periods, based on Ofwat's modelling and data table information about the different companies, but including updated figures for 2018/19 and 2019/20, as shown in the table below.

Table 6: Alternative choices of modelling year periods (2017/18 prices)

Input data period	DD (2011-12 to 2017-18)	2012-13 to 2018-19	2013-14 to 2019-20	2013-14 to 2017-18	2014-15 to 2018-19	2015-16 to 2019-20
Years of input data used	7	7	7	5	5	5
Wholesale Water	3,045	3,229	3,464	3,096	3,478	3,726
Delta vs DD	–	184	419	51	433	681
Wholesale Wastewater	3,151	2,965	2,964	2,987	2,908	2,852
Delta vs DD	–	(185)	(187)	(164)	(243)	(299)
Wholesale Water + Wastewater	6,196	6,194	6,428	6,083	6,386	6,578
Delta vs DD	–	(2)	232	(113)	190	382

Source: Ofwat data tables. Thames Water analysis.

⁴⁶

Competition and Market Authority, 2015, "Bristol Water plc – a reference under section 12(3)(a) of the Water Industry Act 1991".



- 5.9 We are concerned that the choice of benchmarking period, from 5 to 7 years, results in such differing results for our water and wastewater base cost modelling results – this should not be the case in a stable system.
- 5.10 Further, we are concerned that excluding the last 2 years (2018/19 and 2019/20) from the benchmark omits important trends. In both the 5 and 7 year periods, when later years are added sequentially: i) wholesale water botex increases; while ii) wholesale wastewater botex decreases. This means that across the industry, the water botex trend is increasing in later years, while the waste botex trend is decreasing. If these trends are omitted from the totex allowances, then not only is Ofwat working with out of date information, but allowances will under/over fund important work for our customers.
- 5.11 Given this lack of stability and omission of up to date totex trends, we ask Ofwat to re-consider its calculations. This could be done easily using information in Ofwat's own data tables. When we re-calculate the average base totex allowance for Thames Water with the most recent information, we conclude a range of **additional allowance between £232m** (based on 5 years models) **and £382m** (based on the 7 years models).

Upper quartile expectations for both totex and outcomes

- 5.12 Ofwat cost allowances are based on a notional company which is at the industry upper quartile cost frontier, at the same time as being at upper quartile performance levels. Such a notional company is an exception instead of the rule among the companies with the complexity and reach of Thames Water and so this benchmark is unrealistic. The draft determination has set our cost allowances against upper quartile cost performing companies; while it also sets our outcome expectations against a stretching level of PC which include the delivery of upper quartile performance for some of the PCs – which we do not think is a fair approach.
- 5.13 Most of the upper quartile cost companies that could be classified as similar to Thames Water by size and complexity, do not demonstrate upper quartile performance. Therefore, Ofwat's approach is not correct for most companies comparable with Thames Water as it imposes a double challenge (i) companies are required to improve their efficiency in costs to achieve UQ in their cost delivery and (ii) they are being asked to deliver additional quality without the necessary linked costs. Ofwat's approach would only be correct if one were to assume that increasing quality can be created without incurring additional costs.
- 5.14 In addition, when setting the target for PCs (and their associated costs) based on upper quartile delivery, Ofwat does not consider the starting point of the different companies. This assumes that if companies are not currently delivering at upper quartile levels it is due to the company's own decisions in previous years. We disagree with this assumption as our decisions about level of outcomes have been guided by our customers' requests and the business plans approved by Ofwat in previous price controls. Those plans included targets for the different outcomes and the associated levels of costs that Ofwat considered to be efficient.
- 5.15 Therefore, by assuming that those plans were never efficient (i.e. that all companies should have the same levels of assets and services), Ofwat would be penalising companies for decisions Ofwat considered efficient when they were made. More concretely, it will be asking companies to deliver more stretching improvements in performance without allowing for the additional costs



that other companies incurred in previous price controls. To illustrate how Ofwat approached performance in previous controls, see the box below.

Box 1: Ofwat approach to evaluating costs from improvements in quality in PR09

This box illustrates the approach used by Ofwat in PR09, to show that Ofwat did not assume that companies would converge in performance and, further that Ofwat's decision process did not encourage this convergence.

To illustrate this, the list below shows the challenges Ofwat set for sewer flooding investments in PR09:

- "Cost-benefit analysis – we have not applied a rigid cost-benefit test at scheme level, but we have taken account of wider evidence on customer priorities and willingness to pay alongside CBA evidence. We have excluded programmes aimed at 1-in-20 year, or external flooding risks, if they have poor CBA or willingness to pay evidence."
- Forecast new sewer flooding problems – we have challenged companies' forecasts of newly emerging sewer flooding if they were not well justified, especially if higher than the five-year average for net additions. Future water and sewerage charges 2010-15: final determinations
- Major scheme challenges – we have removed or reduced the scope of schemes where there was no or limited information about costs, benefits or where we felt the level of risk reduction proposed did not appropriately balance the risk between company and customer.
- Reduction in high risk of flooding – we asked two companies to develop their proposals so that there was a larger reduction in the numbers of properties on the high-risk registers."

These challenges show that Ofwat did not consider the level of current performance when determining whether to allow additional investment. In addition, some of the schemes were disallowed which limited the capacity of the companies to converge.

Source: Pages 94 and 95 in Ofwat PR09 final determination document.

- 5.16 Using the information provided by the companies that deliver upper quartile in costs, we have calculated the additional costs these companies require to deliver upper quartile performance as required by Ofwat. We calculated the gap in performance upper quartile companies are being required to close and, using the marginal costs they have provided⁴⁷, we calculated the cost per household each upper quartile company would need to close these gaps. This results in an average cost per household of £30 per household for water and £22 per household in wastewater.
- 5.17 This would result that an efficient company the size of Thames Water would require an **additional minimum allowance to deliver upper quartile quality of £255m in its base expenditure (£120m in water and £135m in wastewater) to deliver upper quartile in performance.**

C Choices in Ofwat's modelling

- 5.18 We have a number of concerns about the choices made in forming the models that assess and set the totex for a number of items. These concerns explain part of the gap between our plan and the DD. In this section, we discuss:
- Impact of difference between companies on benchmarking;
 - Allowances for growth;
 - Real price effects;
 - Frontier shift; and
 - Retail cost modelling.

⁴⁷

When no marginal cost was provided, we have assumed the average marginal cost in the industry.



Impact of difference between companies on benchmarking

- 5.19 Ofwat assumed that any cost not explained by its econometric models is attributable to inefficiency. This assumption is unrealistic as the models are unlikely to capture all the characteristics of the companies. Part of the error term is likely to be coming from some of these unique characteristics.
- 5.20 In some cases, companies will have a cost advantage that will not be replicable by rivals. As a result, if some companies are different and have characteristics that cannot be replicated by the other companies, then these differences would be deemed to be inefficient.
- 5.21 By not considering whether such effects exist, Ofwat's models could be over-diagnosing inefficiency in the industry, and setting efficiency challenges that go beyond the efficiency frontier.
- 5.22 One obvious difference between water companies is the size and complexity of the larger companies, in comparison to the smaller companies. In previous price controls, Ofwat used to exclude smaller companies (less than 3% of the industry) from benchmarking⁴⁸. This has not happened in PR19.
- 5.23 In water benchmarking, 3 out of the 5 companies would not reach that minimum threshold: Portsmouth Water, Dee Valley and South Staffordshire Cambridge Water⁴⁹. When we recalculated the water base totex benchmarking, excluding these smaller companies, **the Thames Water allowance increases by £53m in water.**

Allowances for growth

- 5.24 Growth in demand has two effects on the cost of a company. On the one hand, it increases the base costs (opex and maintenance) as the same assets are used to deliver services to a growing number of consumers. On the other hand, the creation of new connection comes as an additional cost (enhancement costs).
- 5.25 To reflect these two effects, growth is considered in two different ways in Ofwat's DD modelling suite. First, the growth in the number of connections is one of the core inputs in the econometric models that explain base costs. Second, the cost of these new connections is included into the explanatory variable in those models.
- 5.26 We note the use of ONS data to develop an estimate of the growth variables rather than historic company data. However, as proposed in previous submission, we still consider that this estimate needs to be improved by using companies' forecasts for the number of new connections. We commissioned a study to forecast a P50 growth assumption. This study used historic data to calculate the probability of each Local Authority (LA) delivering their housing plans. These probabilities were then used to weight the forward-looking plan for each of these LAs. This is a refinement of the WRMP volumes for new connections and acknowledges that LA forecasts have a varied probability of being delivered.
- 5.27 We consider that by combining historic performance with forward looking plans provides a more realistic estimate of our growth estimates. **This adjustment would result in a further increase in Thames Water in £94m.**

⁴⁸ Page 14 in Ofwat (2008), Relative efficiency assessments 2006-07 – supporting information.

⁴⁹ Table showing the percentage of the overall totex of the industry attached in Appendix 2 (TW-DD-A02).



Real price effects

- 5.28 We welcome Ofwat's decision to review the case for an RPE adjustment to reflect the expected evolution of labour costs.
- 5.29 However, we ask Ofwat to introduce a similar adjustment for energy costs. In their report, Europe Economics shows that most companies expect that energy prices grow faster than inflation (1.7% on average). As a result, companies expect that their costs will increase due to the prices of energy that, as it will be discussed below, are outside of the company's control. Therefore, by not including an allowance for this expected growth in costs, Ofwat is passing additional risks to companies without recognising the effects this can have on the risks faced by investors. This would cause an increase in the expected costs of the company that will not be recoverable.
- 5.30 To arrive at its decision not to include adjustments for energy costs, Ofwat used the new framework developed by Europe Economics for the evaluation of RPEs. Below we present our concerns with both the overall framework and how it has been applied with respect to an RPE for energy prices.
- 5.31 When considering the overall framework, we have two main concerns:
- **Ofwat sets unnecessary requirements to show that the prices of the inputs are expected to evolve differently than inflation:** To ensure an RPE allowance companies need to show that the wedge between input prices and inflation existed in the past and it will exist going forward. The objective of an RPE adjustment is to ensure that the risk associated with the evolution of the prices of the inputs are passed to consumers as they are in a better position to manage these cost variations. As a result, Ofwat's concerns should be with forward looking costs. Requiring evidence about the past evolution of costs introduces an unnecessary burden on companies and disregards the costs faced by the companies; and
 - **Companies have a limited control over inputs costs and increasing this control is costly:** Companies face two major limitations when managing the prices of their inputs: they cannot modify the price of their inputs and they compete for resources with other sectors (e.g. companies risk losing skilled workers if they were to reduce wages). As a result, water companies have a limited capacity to manage their input prices. As Ofwat indicated, for some of these risks, companies can acquire financial assets that allow them to manage this risk. However, these assets come at a cost that is currently not included in Ofwat determinations.
- 5.32 Based on the discussion above, we consider that Ofwat should introduce an RPE adjustment for energy prices as the company has a limited control over the prices of this input and the prices are expected to grow faster than inflation.
- 5.33 If this is not sufficient, we also have concerns on how Ofwat has implemented the framework when considering the introduction of an RPE allowance for energy. Ofwat decided not to allow this RPE as the existence of a wedge depends on the period that is taken as a base for the analysis. This decision is based on an inconsistent use of evidence. If Ofwat were to use a consistent approach and exclude the period after the financial crisis (as done in the choice of the frontier shift), the evidence would support the introduction of this allowance.



- 5.34 This consistent application of the time frame for the analysis would result in a change in the analysis for this RPE as energy would pass all the tests put forward by Ofwat. As a result, Ofwat should introduce an RPE allowance for energy. Otherwise, Ofwat is passing the full risk on energy price variations to companies which increases our risk even further with the linked challenges on financeability.
- 5.35 In the case of Thames Water the introduction of an RPE on energy would result in an **increase in our allowance in £14.1m** as energy represents, on average, 10.8% of the industry cost⁵⁰.

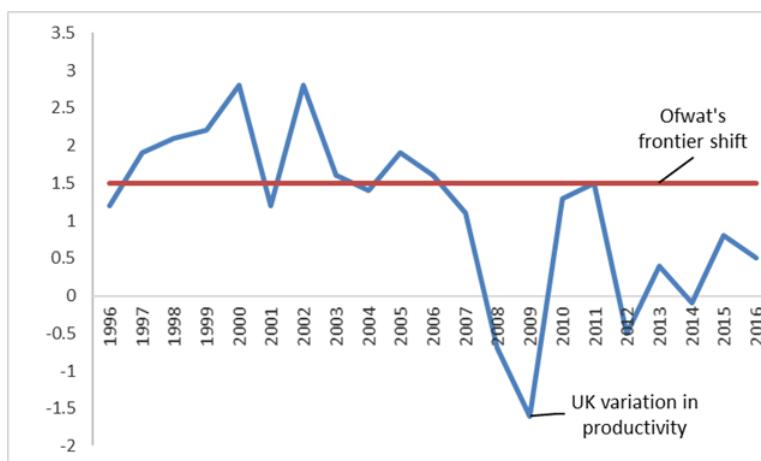
Frontier shift

- 5.36 After considering the arguments put forward by the companies, Ofwat's DD continued the 1.5% efficiency challenge from the IAP. According to Ofwat, companies should be able to obtain this increase in efficiency as a result of improvements in efficiency in the economy (total factor productivity), as well as from the introduction of totex regulation in PR14. We consider:
- Total factor productivity;
 - Productivity caused by changes in Ofwat's totex regulatory framework; and
 - Our conclusion from the evidence.

Total factor productivity

- 5.37 We are still concerned that Ofwat's estimate of efficiency improvements appears to be inconsistent with the actual variations in productivity in the economy in recent years. The figure below shows the evolution of the productivity in the recent years.

Figure 10: UK economy productivity: Annual percentage change in GDP per hour worked (constant prices)



Source: ONS⁵¹.

- 5.38 This figure shows that labour productivity in the UK economy since the financial crisis has grown slower than the rate assumed by Ofwat to set the PR19 productivity challenge.

⁵⁰ We have excluded bioresources from this analysis. The energy generated by bioresources costs should be included at market prices in the others part of the value chain. However, these are considered as negative costs for bioresources. As a result, companies only face market prices for energy in the parts that of the value chain that do not include bioresources.

⁵¹ ONS, International Comparisons of Productivity - Final Estimates, 2016 as published the 6 April 2018.



- 5.39 In addition, this slow increase in productivity is not expected to change in the near future. The table below shows the evolution of total factor productivity and provides the forecast for this variable developed by the Bank of England.

Table 7: Percentage of change in TFP (quarterly average)

1998-2007	2008-10	2011-14	2015-18 (Q3)	2018 (Q4) – 22 (Q1)
1.0%	-0.6%	-0.1%	0.2%	0.3%

Source: Bank of England⁵².

- 5.40 Total factor productivity only started to recover from the effects of the financial crisis in the period 2015-18. Even during that period, the improvements in TFP were much smaller than the 1% average obtained before the financial crisis. UK productivity is forecast to continue being less than half of 1% in the future.
- 5.41 Ofwat asked Europe Economics to review its previous findings in light of the comments provided by the companies in response to the 1.5% efficiency frontier challenge. The report concludes that its previous findings still stood and that productivity could be expected to increase in a range of 0.6% to 1.2%. Even though the Bank of England evidence disagrees with Europe Economics' assertion, we would point out that even this optimistic range is smaller than Ofwat's choice of 1.5% improvement in efficiency.
- 5.42 In addition, we would like to re-state our challenge in the IAP. When Europe Economics evaluates the potential for frontier shift, it assumes that the water industry can achieve the same productivity growth as other sectors, but without considering their differences in cost structure. This generates a 'pick-and-mix' approach that does not account for differences in maturity, disruption and innovation.
- 5.43 We find this approach to be somewhat arbitrary. When we take the data presented in the Europe Economics report for Ofwat and use simple averages for the most recent years shown (2010 to 2014), for the industries shown in the report, then the productivity improvement equals only 0.6% as we proposed in our IAP.
- 5.44 Contrary to our request for Ofwat adopt the low end of the range to reflect the average level of frontier shift across sectors, Ofwat has decided to select a figure above the 0.6%-1.2% range recommended by Europe Economics (1.5%). To reach this conclusion, Ofwat points out that in its report, Europe Economics indicated that Ofwat could consider values in the upper part of their range:
- **To take into account of alternative measures of productivity:** Europe Economics used the standard methodology for this kind of study and developed measures of TFP based on Gross Output (GO). The report also considered another potential measure of productivity: Value Added (VA). This measure provides higher estimates but Europe Economics decided to disregard the results due to the strong assumptions required to calculate the VA estimates. However, Europe Economics then indicated that Ofwat could take a high point in their proposed range of GO estimated productivities to reflect the higher values obtained with VA estimates. This appears to be a selective use of the evidence as if these values are not robust, they should not be included in any part of the analysis; and

⁵² Bank of England, Inflation report August 2019.



- **To reflect the increase in efficiency that could be obtained as increases in the quality:** Europe Economics indicated that their productivity estimates were conservative as they did not account for changes in quality. If these changes were to be included, the improvements in efficiency would be more significant. This is a standard assumption but in this case Ofwat is, in parallel, imposing stretching improvements in quality. Therefore, by choosing a high point in the range identified by Europe Economics, Ofwat would be imposing this efficiency challenge twice. In fact, the introduction of a set of stretching targets would then seem to indicate that Ofwat should go towards the lower end of the range developed by Europe Economics.
- 5.45 Based on these concerns, we consider that a frontier shift of 0.6% reflects better the reality supported by the data. This value is the average efficiency achieved among the sectors Europe Economics has identified as being comparable. Further, it will reflect the stretching efficiency challenge being put forward as part of the improvements in quality.

Productivity caused by changes in Ofwat's regulatory framework

- 5.46 To estimate this adjustment the DD, relies on the results from a report by KPMG, interpreted by Ofwat. As indicated in our April response, we have concerns about the assumptions underpinning the analysis in that report. Our concerns are:

- **The efficiency estimate is based on experience in the electricity distribution networks and an assertion that this experience will repeat in the water sector:** Ofwat's position is based on the experience of totex in the electricity distribution sector. It is not clear that experience in the electricity distribution sector will be replicated in the water sector – and this assertion has not been justified by Ofwat. For example, electricity distribution has been facing significant technological changes as a result of decarbonisation policies – which could have led to efficiencies. None of these changes could be ascribed to the introduction of totex. Therefore, it is difficult to assume that such efficiencies could be replicated in the water sector;
- **The efficiency estimate relies on company forecasts and judgements rather than actual data:** The electricity distribution benchmark used in this analysis relies on one single observation and even this is an estimate, given that the second electricity distribution regulatory period since the introduction of a totex regime has not yet finished; and
- **The efficiency estimate assumes that there are no other external factors affecting outperformance:** The report assumes that the difference between the regulators' allowances and the actual costs of the company are pure improvements in efficiency. This assumes the regulator has perfect foresight during the price control, and that differences cannot be attributed to uncertainty around costs when the price control was set or to external shocks. This appears to us as too strong an assumption.

- 5.47 Consequently, the results of this analysis would not support an additional efficiency challenge.

Our conclusion from the evidence

- 5.48 As in the IAP, when Ofwat evaluates the potential for frontier shift, it assumes that the water industry can achieve the same productivity growth as other sectors, but without considering their differences in cost structure. This generates a 'pick-and-mix' approach that does not account for differences in maturity, disruption and innovation.



- 5.49 We find this approach to be somewhat arbitrary. When we take the data presented in the Europe Economics report for Ofwat and use simple averages for the most recent years shown (2010 to 2014), for the industries shown in the report, then the productivity improvement equals only 0.6%. This reduction of the frontier shift to values that are supported by the current evidence would **increase Thames Water's wholesale allowance by over £180m in base costs alone.**

Retail cost modelling

- 5.50 After considering the changes Ofwat has introduced into the retail models, we welcome some of the changes but we still have some concerns in the following areas:

- The efficiency challenge should depend primarily on historical cost performance;
- The residential retail control should be modelled in nominal prices;
- Modelling of transience does not capture its full cost impact; and
- The modelled impact of the % metered customers variable remains unreasonably high.

The efficiency challenge should depend primarily on historic cost performance

- 5.51 We recognise that the DD has changed from the IAP's approach of setting benchmarks based on forward-looking projections, to an average of the forward-looking upper quartile and historic performance. However, Ofwat has not explained why the different approach to retail is appropriate, compared with wholesale, where historic performance alone is benchmarked. Further, Ofwat have not provided any evidence whether the stretch inherent in a forward-looking upper quartile is reasonable and can be delivered.
- 5.52 We estimate that determining allowances based on historic performance, consistent with Ofwat's approach in wholesale controls, increases **Thames Water's allowance for this control by £42m⁵³.**

The residential retail cost control should be modelled in nominal prices

- 5.53 In obtaining companies' efficient allowances, it is important to use a consistent inflation basis. This will avoid double counting or missing inflation, and ensure that the price base of the model outputs are consistent, and clearly identified. Given Ofwat's general approach is not to index residential retail costs to any measure of inflation, then the most natural approach appears to be to use input data consistently in nominal prices. This is also consistent with the price base in which companies have submitted their residential retail costs (data table R1). For example, a £70m cost forecast by a company in 2024 is £70m in 2024 and not £62m as Ofwat's adjustment currently produces. In order to be fully consistent, such an approach would also require any inputs from the wholesale price control (e.g. the wholesale bill which affects the retail bad debt), to be in nominal prices.
- 5.54 Ofwat has established efficient allowances in the retail control on an inconsistent price base, including input data in 2017/18 CPIH prices but then comparing the results from these models with companies' business plans retail costs in outturn prices to obtain the forward-looking upper quartile. Given the inconsistency in price base, this does not generate appropriate costs outputs.

⁵³ We undertook this estimation by setting the weights attached to historical performance and forward-looking at 100% and 0%, respectively, and then updating our allowances.



- 5.55 We therefore request that Ofwat use input data on a consistent price base in the Final Determination models. Using input data consistently in nominal prices appears to be most appropriate, given that no indexation is applied in the retail price control. Our analysis indicates that Ofwat's current approach **understates Thames Water's retail allowance by £38m.**

Ofwat's models do not capture the full cost impact of transience

- 5.56 Transient consumers have a higher probability of incurring bad debt which increases the retail costs of the company. In our April plan, we were concerned that the allowance resulting from the models did not fully account for the effect of these consumers. This was the result of only one of the models including a variable that accounted for this effect. Further, in that model the variable reduced the allowances which is a counter-intuitive effect.⁵⁴
- 5.57 For the DDs Ofwat has refined its models on both counts but we still have concerns about the implicit allowance obtained in relation to transient consumers. Transience is only included in two of the five models that Ofwat used to determine allowances for bad debt (stand alone or as part of total retail costs). As a result, the final triangulated retail allowance includes less than 50% of the transient allowance⁵⁵ identified by Ofwat's models. This implies, that companies, like Thames, serving more transient customers will be undercompensated.
- 5.58 Our April plan included a transience cost adjustment claim. In that claim we established that the additional and efficient costs we incur because of serving more transient customers amount to £63m. Ofwat rejected this claim on the ground that their models already provide an allowance for transience.
- 5.59 However, when we estimated the allowance from Ofwat's DD models, we estimate an implicit allowance of about £50m. This falls short of our £63m claim. As such, we find that Ofwat's models do not fully account for the impact of transience on our residential retail costs.
- 5.60 While we think this is an important cost driver for Thames and the short-fall is significant for retail, we are just noting the point as the other aspects of retail modelling provide would provide sufficient allowances.

Ofwat's models significantly overstate the impact of the meter reading variable

- 5.61 In our April plan, we raised a concern about Ofwat's models overstating the impact of the *proportion of metered customers* variable on efficient costs. In our submission we provided evidence that in those models the additional allowance received for having additional metered customers was larger than the additional cost these customers cause.
- 5.62 This is counter intuitive as meter reading costs are the main difference in the costs of serving metered versus unmetered customers. As such, we expect the impact of this variable in Ofwat's allowances to be in line with the actual costs companies incur in reading their customers' meters.
- 5.63 However, a comparison of the results of the models for two companies, one with no metered customers and one with all metered customers, the difference in unit costs is larger than the metering costs. As a result, the company with low metering rates will be undercompensated.

⁵⁴ See page 46, Section 3F of our April 2019 response to Ofwat's IAP.

⁵⁵ The inclusion of transience in one bad debt and one total retail cost model means that Ofwat only allows transience to explain 5/12 of the costs that it impacts on. 5/12 determined as $1/2 * 1/2 + 1/2 * 1/3$.



- 5.64 After evaluating the new models provided by Ofwat, we observe that that effect still persists, the table below compares the company estimates for these allowances with Ofwat's estimated allowances:

Table 8: Incremental allowance versus average metering cost

Company	Incremental allowance (£/metered customer)		Average metering cost per metered customer (£/metered customer)	
	ROC2	RTC8	Historical	AMP7 forecast
ANH	17.75	12.49	2.59	1.87
NES	16.61	14.41	5.08	3.85
NWT	10.31	10.60	4.89	2.30
SRN	22.00	16.47	8.32	3.14
SVH	22.66	15.60	4.76	4.09
SWB	15.65	12.83	2.62	2.60
TMS	15.40	14.34	6.55	4.07
WSH	11.39	10.89	4.40	3.34
WSX	23.14	16.40	5.43	3.87
YKY	11.54	10.21	2.39	1.61
Simple Average	16.65	13.42	4.70	3.07

Source: Thames Water analysis based on data published on Ofwat's website at their Draft Determinations.

- 5.65 This table shows that the implicit allowance in Ofwat's models ROC2 and RTC8⁵⁶ is significantly higher than the average metering cost reported by companies. This illustrates that the effect described above still exists.
- 5.66 Our analysis indicates that this impact could be **about £9m** if we were to calculate the difference between Ofwat's implicit allowance in the DD and the implicit allowance that Thames Water would obtain if it would have an average proportion of metered consumers.

Our conclusion from the evidence

- 5.67 Even though Ofwat has addressed some of the concerns we had in the previous version of the models, we consider that there is still some margin for improvement and the need to consider additional adjustments to reflect the realities faced by the companies.
- 5.68 In light of the large number of changes made by Ofwat and the points raised in this section, we believe companies should be allowed to comment on the models used to set allowances in their FDs, with time enough to take into account these comments before December.

D Enhancements and CACs

- 5.69 We have listened to the feedback on our enhancement and cost adjustment claims in the DD. Based on that feedback we have developed tailored responses for those enhancement categories where we consider that additional allowances are required.
- 5.70 These responses can be classified into two main categories: costs that are misclassified as enhancement costs and enhancement costs where we are providing additional evidence. The table below shows the elements in each category and the amounts associated with them.

⁵⁶ These are selected as representative models for Other Retail costs and Total Costs respectively. Ofwat's other models produce similar results.

**Table 9: Wholesale water enhancement cases**

Enhancement case	Totex (£m 2017/18)			Commentary
	Current position	DD Allowance	Variance	
Currently included in base – to be reclassified as enhancement				
WRMP – leakage	£156.5m	-	£156.5m	Response provided
CRI	£90.4m	-	£90.4m	Allowances for only beyond UQ challenged
Supply interruptions	£55.6m	-	£55.6m	
Currently included in enhancement				
Resilience – NELR	£181.5m	£56.7m	£124.8m	Response provided
WRMP – metering	£326.8m	£178.1m	£148.7m	Response provided
Lead standards	£78.2m	£63.5m	£14.7m	Deep dive required
WRMP – interconnection	£18.9m	-	£18.9m	Deep dive required
SEMD	£122.9m	£14.4m	£108.5m	Response provided
WINEP – Water framework directive	£119.8m	£92.3m	£27.5m	Response provided

Source: Thames Water and Ofwat DD.

Table 10: Wholesale wastewater enhancement cases

Enhancement case	Totex (£m 2017/18)			Commentary
	Current position	DD Allowance	Variance	
Currently included in base – to be reclassified as enhancement				
Pollution reduction	£66.9m	-	£66.9m	Allowances for only beyond UQ challenged
Currently included in enhancement				
First time sewerage	£8.7m	£3.3m	£5.4m	Deep dive required
WINEP - P removal	£158.1m	£120.4m	£37.6m	Response provided
WINEP - Sanitary parameters	£62.8m	£35.5m	£27.3m	Response provided
WINEP- Chemical removal	£10.2m	£6.8m	£3.4m	Deep dive required

Source: Thames Water and Ofwat DD.

Table 11: Cost adjustment claims

CAC case	Totex (£m 2017/18)			Commentary
	Current position	DD Allowance	Variance	
TTT	- £310m	- £328m	£18m	Response provided
CRMB	£43.8m	-	£43.8m	Response provided
London network maintenance	£120m	-	£120m	Response provided

Source: Thames Water and Ofwat DD.

- 5.71 This section will start by presenting our concerns on enhancement costs being misclassified as base costs. We then summarise the evidence we have presented for each of the enhancement costs.

Cost misclassified as base costs

- 5.72 In the DD, Ofwat assumes that base allowances should allow companies to deliver upper quartile performance in some of the Performance Commitments. As a result, Ofwat limited the allowances for four of Thames Water's enhancement cases: leakage, CRI, supply interruptions and pollution incidents.



5.73 We disagree with this approach for 3 reasons:

- Upper quartile in costs do not imply upper quartile in performance;
- Differences in the delivery of the companies are a function, at least partially, of previous decisions by Ofwat; and
- Base costs would not allow for improvements in efficiency.

5.74 The first 2 points were discussed above and, as a result, we do not consider them here. The focus in this section is the third point.

Base costs would not allow for improvements in efficiency

5.75 Ofwat is assuming that base expenditure will allow companies to improve their performance. This assumption, however, is not consistent with the definition of enhancement. To improve quality, companies implement a combination of opex and capex solutions. Opex solutions would need to be maintained over time to ensure that the level of performance remains. Capex solutions, that were qualified as enhancement by Ofwat in previous price controls, would not be included in the base expenditure. These assets would need to be operated and maintained to ensure they keep delivering at the specified levels of quality. These costs would be included into the base expenditure but, under normal circumstances, would not improve the quality any further as implied by Ofwat.

5.76 Therefore, base expenditure should allow companies to maintain the current level of performance (on average) but not allow for additional improvements in efficiency except if new allowances are granted. This was Ofwat's previous policy and it is more consistent with the reality of the sector. This is illustrated by an example in the box below.

Box 2: Assumptions about leakage evolution in PR09

In its final determination for PR09, Ofwat published its assumptions about the expected evolution of leakage. The assumptions for the WASCs are summarised in the table below:

Table 12: PR09 leakage level assumptions (Ml/d)

	2010/11	2011/12	2012/13	2013/14	2014/15
Anglian	212	212	211	211	211
Dŵr Cymru	190	188	186	185	184
Northumbrian	150	150	150	150	150
Essex & Suffolk	66	66	66	66	66
Severn Trent	483	474	468	456	453
South West	84	84	84	84	84
Southern	83	80	79	78	77
Thames	674	673	673	673	673
United Utilities	464	464	464	463	463
Wessex	71	71	71	71	71
Yorkshire	297	297	297	297	297

Source: Ofwat PR09 final determination document.

This table shows that for most companies Ofwat assumed a stable evolution of leakage. Under Ofwat's PR19 assumption, they would have meant that the costs of the company should have been reduced as no improvement in quality was assumed. However, that was not the case. Therefore, the current approach is inconsistent with Ofwat's previous determinations.

5.77 As a result, we believe Ofwat should reconsider its position and allow additional resources to improve quality.



Additional evidence for the different areas of enhancement and CACs

- 5.78 This section presents the basic reasoning behind each one of the business cases we are putting forward for enhancement expenditure.

Leakage enhancement case

- 5.79 Ofwat's position not to allow any enhancement expenditure for leakage reduction unless the company is both achieving beyond upper quartile performance and⁵⁷ more than a 15% reduction in AMP7 has been robustly challenged by the industry in response to the IAP.

- 5.80 The Water network enhancement cases appendix⁵⁸ justifies the funding required to be able to meet the target of a 20% leakage reduction to 509MI/d from 636MI/d⁵⁹ in AMP7, including:

- Evidence that disproves Ofwat's position that historic leakage reductions have been delivered through base expenditure; and
- Arguments that the performance of benchmark companies cited by Ofwat in the support of its approach is not sufficiently valid.

- 5.81 We are **seeking an allowance for £157m** of enhancement activity for leakage reduction to be made in the final determination, which in combination with the Metering Enhancement Case and London Network maintenance cost adjustment claim described below, allows us to achieve the Plan 20% target⁶⁰.

Illustration - additional cost of achieving a 25% leakage reduction

- 5.82 The enhancement and cost adjustment claims described above do not include the additional cost associated with moving from a 20% to 25% leakage reduction. Neither does achieving this target form part of our *lower cost, lower investment* scenario that we describe in Part B below.

- 5.83 Achieving such a reduction would require a more sustainable mix of work – centring on bringing forward mains replacement activity that our WRMP currently envisages will take place in AMP8.

- 5.84 To illustrate the scale of the challenge in AMP7, **our current estimate of the additional cost is £300m to £350m**. This would be contingent upon the water network enhancement cases (leakage reduction, metering and London network maintenance cost adjustment claim described in the previous section) being fully funded in AMP7.

- 5.85 We remain committed to halving leakage from current levels by 2050. However, significant work in planning and targeting areas of our network with high leakage levels is needed before accelerating our mains replacement programme. We also need to explore partnership opportunities with other utilities and stakeholders to ensure that costs are kept to a minimum.

⁵⁷ The position at IAP had only one criterion needing to be met to secure enhancement funding at the DD this has changed to be both criteria are necessary.

⁵⁸ TW-DD-A03 Water network enhancement case.

⁵⁹ Based on MI/d AMP6 annual average methodology.

⁶⁰ Including £21m of customer side leak repairs from within the metering case which has not been allowed at draft determination.



Resilience - North East London water supply resilience

- 5.86 The costs included in this section were initially considered as part of the uncertainty mechanism we proposed in our April plan. However, Ofwat's rejected that mechanism in DD and, as result, we consider it is appropriate to include a minimum component of that project as it is likely to be undertaken during this regulatory period.
- 5.87 Ofwat has challenged the investment need for the construction of a new WTW to provide resilience of water supplies for North East and Central London. Their challenge focuses on the need case citing the lack of a comprehensive hazard assessment for other systems and whether the proposed solution is best value given alternate phasing of elements of the long-term strategy for supply resilience for all customers. Our prioritisation is based on an appropriate understanding of risk. Our framework has focused primarily on the consequence components of risk because we know that any residual resilience hazards will be below the 'de minimis' level for identification in our business as usual comprehensive risk assessment. Therefore, risk scores will be driven mostly by the consequence component. The sequencing of the elements of our long-term strategy is driven by the understanding of the end state solution for supply resilience and is necessary to achieve an efficient delivery of the strategy and unlock maximum benefits during delivery over the next 25 years. The value to customers of our proposed solution is supported by an initial cost-benefit analysis following industry best practice guidance. We are **seeking an allowance of £117m** to begin the construction of a new WTW in accordance with our long-term strategy for supply resilience⁶¹.
- 5.88 A full evaluation of whether the overall project should be delivered through the DPC mechanism will be undertaken as scope and costs become more certain. To facilitate this evaluation, and a result the introduction of the best option for our consumers, we still consider that these overall costs are suitable for an uncertainty mechanism.
- 5.89 Details are provided in Appendix TW-DD-A04 - NEL supply resilience enhancement case.

WRMP – Metering enhancement case

- 5.90 When evaluating the efficiency of our metering programme, Ofwat has aimed to compare it with those presented by other companies. However, we consider that the comparability between these programmes is limited and, as a result, Ofwat should undertake a deep dive where it evaluates the efficiency of our proposals.
- 5.91 Metering programmes can differ significantly between companies for a number of reasons that include different in their objectives (i.e. focused on reducing leakage vs focusing on providing new services to consumers), differences in the costs being included (e.g. the costs of managing the programme could be allocated to metering or to a central asset management activity) or differences in the allocation of costs between programmes. (e.g. metering costs allocated between metering and leakage management).
- 5.92 These differences were discussed in our response to the IAP and they have been extended even further by evaluating potential refinements to the econometric models that are presented in the relevant appendix.

⁶¹ Differences with the values in the table above are caused by the current efficiency challenges imposed by Ofwat in this cost category.



- 5.93 To account for this lack of comparability, Ofwat requested that we reconcile our unit costs with the benchmark from the econometric feeder model. However, this would require that we have full visibility of the metering programmes of the other companies in the sector which, unfortunately, is not the case as we indicated when we provided the reconciliation:
- "in good faith we have attempted to provide such a reconciliation below, but the same challenges of comparability still exist".*
- 5.94 To address this lack of comparability between programmes, we would like to ask Ofwat to undertake a deep dive based on the information we present in Water network enhancement cases appendix.
- 5.95 When undertaking this deep dive, it is important that Ofwat considers the objective we are trying to achieve and those uncontrollable characteristics of our operating area.
- 5.96 This metering programme was developed as part of our WRMP. In this process we had to achieve a balance between conflicting objectives such as reducing the environmental impact of our operations while managing the impact this could have on bills. After a careful consideration of the different options and proactive engagement with our customers, we developed a programme that provide the best solution for our customers now and in the future.
- 5.97 This resulted in the selection of some solutions that, in the short term, could result in a higher unit cost but they are the most efficient solutions when considering the objectives that we want to deliver as well as the whole life cost of the programme. For example, our programme is based on the deployment of AMI meters to be located, where possible, outside of the customer premises. This solution allows for more efficient targeting of leakage on both our network and on customer supply pipes and offers the largest water use behavioural change from customers.
- 5.98 As indicated above, Ofwat will also need to consider the characteristics of our network and the area where we operate. For a start, a significant share of our metering programme is in London where the costs of works management will be sensibly higher. Further, London also presents a large share of customer living in flats which, as discussed in the relevant appendix, also force a more expensive mix of activity.
- 5.99 Based on these arguments, and the detailed information provided in the Water network enhancement cases appendix, we are seeking an **increase of £149m** in the allowance for metering in the final determination, from that allowed in the draft determination.

Lead standards

- 5.100 Our DD allowance in this area is set solely through the application of econometric models. We have requested and continue to request a deep dive be performed as our programme includes new and innovative approaches to protect our customers from lead in the water supply system which are not well captured by models calibrated by the number of communication pipes being replaced. The DWI have been consulted in the preparation of our programme and have included the full scope in a draft Regulation 28 notice with a final version to follow. This will create a legal obligation for us to deliver solutions which are not funded in the DD. At a minimum we ask that Ofwat include our output numbers of supply pipe replacements (considerably more expensive than communication pipe replacements) as equivalent to a supply pipe replacement within the



model. We are seeking an **increase of £15m** in the allowance for lead standards in the final determination, from that allowed in the draft determination.

WRMP – Interconnection

- 5.101 We have identified that in our April Submission the Shalford to Netley Mill interconnection pipe which is part of our WRMP investment to increase resilience and maintain water resource zone integrity in Guildford was reported as new development instead of as an interconnection.
- 5.102 We have therefore corrected this mistake in our update data tables and include details of the interconnection in appendix TW-DD-A05 - WRMP interconnections enhancement case. We request that a deep dive assessment of this scheme be performed and an **allowance of £19m** be made in the final determination

Water SEMD

- 5.103 Ofwat has rejected our true-up wrapper that we proposed in our April submission to cater for uncertainty over our AMP7 programme. We have resolved the uncertainty of our AMP7 SEMD programme and are now committing, subject to appropriate funding, to deliver 292 outputs for SEMD from 2020/21 to 2024/25 for £122.9m (2017/18 CPI-H price base).
- 5.104 We set out in appendix TW-DD-A07 further details and justification for our AMP7 programme.

First time sewerage

- 5.105 We request a deep dive of our programme for first time sewerage at the final determination as the modelled allowance is only 38% of our Plan costs which are detailed efficient and robust costs for known outputs. We are seeking an **increase of £5m** in the allowance for first time sewerage in the final determination, from that allowed in the draft determination.

WINEP – P removal and Sanitary parameters

- 5.106 A number of the feeder models used to set allowances for components of the Water Industry National Environment Programme either do not adequately account for the factors which truly drive cost or have been applied inappropriately for our circumstances. As such, Ofwat's allowance for the totex we will require for WINEP schemes has been underestimated. We ask for specific adjustments to be made to some models, supported by evidence, or for robust deep-dives being performed where variances between our plan and the modelled allowance are material. In particular, we have concerns about the phosphorous removal, sanitary parameter, first-time sewerage and chemical removal feeder models. Further, we reject Ofwat's justification for the removal of what they consider to be betterment of existing assets for our Water Framework Directive schemes related to abstractions at Bexley and Hawridge.
- 5.107 We are requesting that a deep dive assessment be performed in the final determination and an **additional allowance of £65m** be made against these two drivers above the allowance in the DD.
- 5.108 We provide more detail in TW-DD-A06-WINEP enhancement case.



TTT

- 5.109 Ofwat has intervened to reduce our submission for non-property related costs by £17.4m and increase the expected income from property and land sales by £100m.
- 5.110 In this response we accept the increase of £100m in property income. However, for non-property costs, we have provided additional detail in an appendix to this response, TW-DD-A10. This includes signposting relevant information provided in the May 2019 Addendum TW-CE-A17-01.
- 5.111 We request that Ofwat consider the additional information provided as evidence that the costs in our April submission are necessary and efficient and therefore, revise their view in our Final Determination and **increase our allowance by £17.4m**.

CRMB depreciation

- 5.112 In our PR14 business we included a 'new cost' to ensure the delivery of a CRMB system to replace our 1990's Customer Information system. In the Final Determination, Ofwat approved this expenditure and included £23.7m of depreciation charges in our allowed costs for AMP6. This was in line with our submission and covered the first 3 years of depreciation for the CRMB system across a 10-year asset life. In allowing this 'new cost' we believed that Ofwat had considered that we had demonstrated the need to develop and implement a new CRMB system, the robustness of our cost estimates and the benefits it will deliver for our customers.
- 5.113 The process to recover these costs agreed at PR14, is to spread the investment over the 10 years of the lifetime of the asset. Therefore, the investment needs to be recovered through AMP7 and AMP8 Retail price control. To reflect this agreed approach, we included in our PR19 plan a cost adjustment claim of £43.8m to allow us to recover depreciation charges over the period 2020 – 2025 (2014/15 prices) for this project.
- 5.114 This CAC was rejected by Ofwat on the grounds of failing Ofwat's test for the need for cost adjustment. We understand that methodologies can change over time, however, the change to the approach on depreciation means that the level of investment made for a major strategic system such as our SAP CRMB is not being recognised or allowed. Ofwat approved this investment at PR14 and should include the appropriate funding in the review periods over which we planned to recover this investment.
- 5.115 Our claim is for the **£43.8m of depreciation charges that has flowed through to AMP7**.

London network maintenance cost adjustment claim

- 5.116 The water network in London is in the most challenging condition in the country - this elevates the costs required from its maintenance relative to the industry. Evidence to support this claim has been provided in different regulatory submissions to Ofwat over the years and can be attributed to three key factors:
 - **Age of the network:** We have the oldest network by a significant margin and this age is reflected in the use of cast iron and spun iron pipes which are reaching the end of their serviceable life;
 - **Soil corrosivity:** Ofwat have accepted in principle the argument that London soils are more corrosive with higher fractivity. The prevalence of clay soils, paved surface types and



- natural gravel drainage means that it harder to for us to detect leakage visibly than in other areas of the country; and
- **Traffic loading:** London has the busiest streets in the UK and the forces exerted on the network by the constant braking and accelerating of cars and lorries increases the rate of network deterioration.
- 5.117 We provide a more detailed response to the DD assessment of this CAC in the Water network enhancement cases appendix⁶². We are seeking a **cost adjustment claim of £120m** to be made in the final determination.

E Other cost items

- 5.118 Finally, we have concerns about Ofwat's approach to other specific cost items, which explain part of the gap between our plan and the DD. These include:
- Business rates; and
 - Grants and contributions (developer services).

Business rates

- 5.119 In our September Business Plan, we included our best forecast of future business rates based on expert advice from the UK's leading water industry rating expert, Mike Peacock of Savills. He used his knowledge of current Valuation Office (VO) approaches together with recent Tribunal case law precedents (many of which involved him acting as the expert) to forecast likely rateable value listings. This forecast included expectations of increases in valuations over AMP7.
- 5.120 In its IAP, Ofwat explicitly excluded any expected revaluations from its analysis and allowances on the basis that it was difficult to forecast:

*"A few companies include increases in business rates due to the revaluations planned in 2021 and 2024. Other companies do not factor in any changes due to the revaluations as there is too much uncertainty. We do not consider that there is compelling evidence to robustly forecast the impact of these revaluations and therefore we do not take them into account in our allowances."*⁶³

- 5.121 We are concerned that the rejection of upwards revaluations over AMP7 will create a significant funding shortfall, which is outside of our control.
- 5.122 We accept there is uncertainty over the projected revaluations. This uncertainty is not unique to the water industry. In energy, Ofgem treats business rates as a pass through item. To reflect this uncertainty, we removed the increase from our projections in our April Submission and included instead a true-up mechanism that would only remunerate actual business rates. However in its DD, Ofwat rejected our proposed uncertainty mechanism.

⁶² TW-DD-A03 Water network enhancement cases.

⁶³ Securing cost efficiency technical appendix, p30.



- 5.123 There is a track-record of revaluations increasing business rates. We have experienced increases in the water network rateable value assessments as follows:
- 2005: £53m;
 - 2010: £112m; and
 - 2017: £202m.
- 5.124 This represents an average growth of 95% each time the list is reassessed. We will face rating re-assessments in 2021 and 2024, both of which fall within the PR19 period. The timing of each of these revaluations is determined by the VO and therefore lies outside of our control.
- 5.125 Given the size of the potential shortfall, we continue to see merit to an end of AMP true-up mechanism to recover these efficiently incurred costs. An uncertainty mechanism is justified on two fronts: first, historical analysis demonstrates a strong growth trend (95%) in rateable value listings; and second, the UK's leading expert is also forecasting growth. While the level of growth is not easy to forecast, the likelihood of it is extremely high.
- 5.126 On this basis a model which does not factor in growth is almost guaranteed to provide an insufficient allowance. In our case, we estimate there will be a **£75m shortfall in allowance**. An uncertainty mechanism recognises a shortfall is likely and provides an opportunity to adjust to reflect reality.

Grants and contributions (developer services)

- 5.127 The modelling of grants and contributions in the draft determination has meant that we have had £55.8m removed from our business plan (£42.5m on Waste and £13.3m on Water).
- 5.128 In the DD, Grants and Contributions were set relative to Growth Enhancement costs in tables WS2 and WWS2. Company growth forecasts were also replaced by an Ofwat forecast taken from ONS property projections by Local Authority area.
- 5.129 The growth forecast changes account for £16m of the difference on wastewater and all of the difference on water.
- 5.130 The methodology used by Ofwat to calculate allowed revenues for Developer Services and efficient costs has led to inconsistent results company by company based upon interpretation of how tables APP28, WS1, WS2, WWS1 and WWS2 were completed. This has created a further shortfall of £26.5m for us on wastewater:
- a) Ofwat has compared our proposed G&C revenues for waste with costs in WWS2. Ofwat has applied assumptions on recovery rates allowed. The logic on Wastewater that our revenue was too large (included the HS2 revenue but NOT the costs – which were in base costs table WWS1). This has reduced allowed revenue as it looks like we were trying to over recover costs by 29.4%; and
 - b) In calculating efficiency based upon econometric modelling with and without growth expenditure, Ofwat has calculated an assumed inefficiency of 16% which is much higher than the base model efficiency.
- 5.131 These issues have been recognised and a consultation was published as part of the Draft determination “Our proposed approach to regulating developer services”.



- 5.132 We have responded in detail to this consultation in Appendix TW-DD-A14 "Response to consultation of regulating Developer Services" and agree with all of the preferred options.
- 5.133 We believe the proposed changes for Final Determination will alleviate this issue. If this is not the case we will be unable to fully fund capacity improvements and with an automatic right to connect, this will increase risk of sewer flooding and pollution events on our existing network and new developments.
- 5.134 The appropriate treatment of these costs would lead to an **increase in allowances of £55.8m**.

F Conclusion – explaining the gap

- 5.135 In this Chapter, we have explained the gap between our plan and the DD – as well as to justify increases in totex to meet the needs of the business to serve our customers. The overall impact of the points set out in this document are summarised in the table below.

Table 13: Summary of our explanation of the gap between our plan and the DD

Issue	Value
Ofwat's approach to totex	
Choice of benchmark years	£232-382m
Upper quartile expectations for both totex and outcomes	£255m
Choices in Ofwat's modelling	
Impact of difference between companies on benchmarking	£53m
Allowance for growth	£94m
Real price effects	£14m
Frontier shift	£180m
Retail modelling	£89m
Enhancement and CAC cases	
	£1,068m
Other cost items	
Business Rates	£75m
Grants and contributions	£56m
Total	c.£2bn

Note: Enhancement costs only include those required to deliver a 20% reduction in leakage from 636 Mld in 2019/20 to 509 Ml/d by 2024/25.

Source: Thames Water's analysis.

- 5.136 We are very concerned about the issues raised in this chapter. The shortfall in totex allowance would result in significant under-investment in our performance and future capabilities. Therefore, we ask Ofwat to carefully consider the points raised in this chapter, and to increase our totex allowances in the final determination accordingly.
- 5.137 As noted earlier, if the cost models change significantly again prior to the final determination, we would expect an opportunity to interact with Ofwat on this issue.



Chapter 6

Risk and return

A Introduction

- 6.1 In this Chapter, we provide commentary and evidence about our concerns around the balance of risk and return in the DD. We discuss:
- **Section B:** The DD's overall approach towards ODIs
 - **Section C:** RoRE range;
 - **Section D:** Cost of capital;
 - **Section E:** PAYG;
 - **Section F:** Distributions policy;
 - **Section G:** Gearing sharing mechanism; and
 - **Section H:** Executive pay.

B The DD's overall approach towards ODIs

- 6.2 We have major concerns about the DD's approach to setting ODIs:
- The DD's ODIs do not reflect our customers' priorities;
 - The DD's ODIs create a strong negative skew; and
 - The DD's ODIs create clear financeability risks.

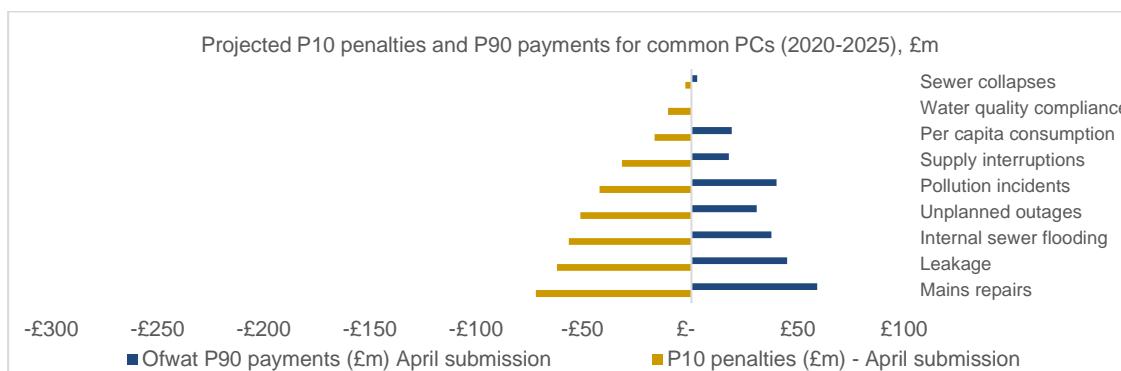
The DD's ODIs do not reflect our customers' priorities

- 6.3 Since 2015, we have gathered insight from over one million customers to determine investment priorities, the level of service in each area of the business, and the overall balance of the Business Plan. We have also sought views from customers from a range of ethnic and socio-economic backgrounds including vulnerable customers. A wide-range of methods were used and have been carried out by a range of independent market research companies (BritainThinks, Community Research, Populus, eftec and ICS) working to best practice. Oversight was provided by our Customer Challenge Group and the insights were subject to academic peer review.
- 6.4 Our customer preference research programme was implemented to ensure that all investment cases covering asset health, resilience, water resources, flooding, and environmental quality could be valued appropriately and efficiently. Insights and evidence to calculate the societal and customer values were captured using a variety of methods:
- Market-based impacts and values to determine values based on actual customer choices from observed behaviour and resource costs (e.g. clean-up costs);

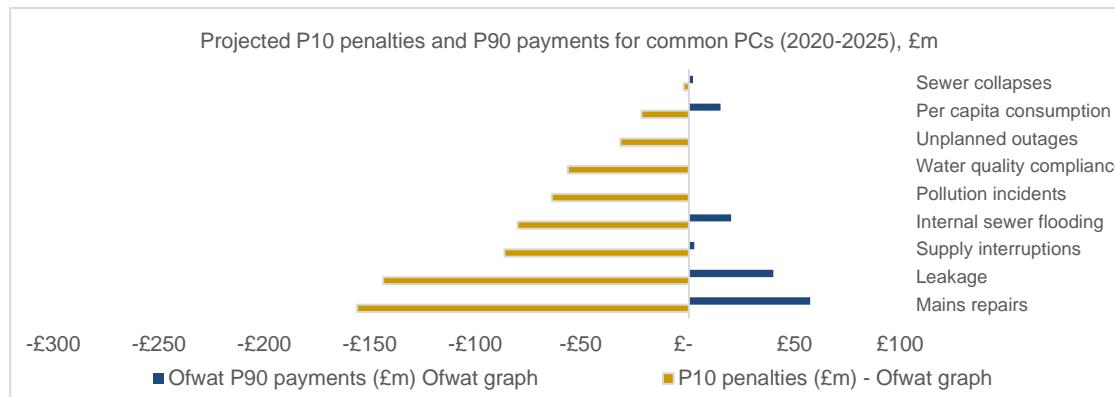


- Revealed preference research to examine customer expenditure and behaviour on products related to water services, assess how these vary with service levels, and estimate the recreation value of open access sites;
 - Stated preference research to provide valuations for maintaining and improving water and wastewater services;
 - Subjective wellbeing analysis to examine the wellbeing impact of sewage odour on customers living in close proximity to treatment works;
 - Value transfer to determine valuations based on previous research;
 - Performance and customer contact data combining operational performance data and customer contact / experience data to cross-check and validate customer preference research; and
 - Other methods have included deliberative research, focus groups, hall-tests, operational data, and gamification. We also built in home visits to educate customers on our day to day operations.
- 6.5 Data gathered through the programme was used to determine the societal and customer values evidence base that were used to design our ODIs, so that the rewards and penalties associated with our performance levels reflect the value of the outcomes delivered for customers, society and the environment.
- 6.6 Prior to submission of the April Business Plan, we used our online engagement tool 'Shape Your Water Future' to gather in-depth and targeted feedback from over 4,000 customers about the acceptability of our proposed levels of service and the associated bill impacts. The views expressed by our customers were factored into our submission.
- 6.7 Therefore, we do not agree with Ofwat's approach to over-write our incentive rates and structures without taking due account of our extensive customer research.
- 6.8 Setting incentives without clearly taking on board the view of customers will result in the company being incentivised to prioritise activities that do not align to our customers' priorities.
- 6.9 For example, based on Ofwat's views of p10 levels of performance, the overall package is dominated by mains repairs and leakage. Our April plan represented a more balanced package of incentives. Yet with Ofwat's interventions, we would be driven to prioritise our mains repair target to a far greater extent than many other measures that are also important to our customers.

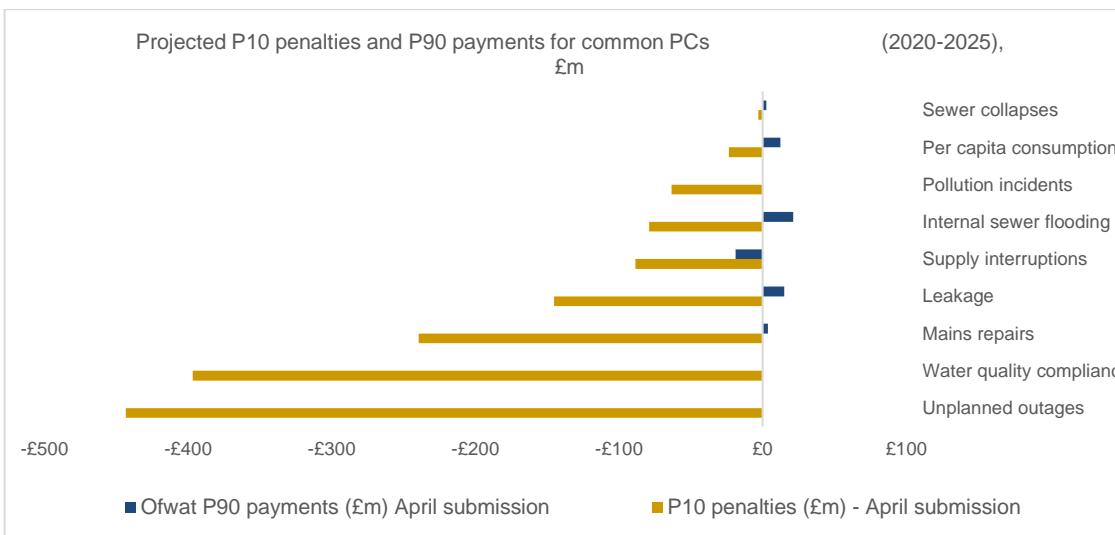
Figure 11: Common measures – April plan



Source: Ofwat's DD.

**Figure 12: Common measures - DD**

- 6.10 This is based on Ofwat's view of what our p10 position would be. We note that Ofwat has applied a top-down adjustment to caps and collars without analysis of the volatility of the measure for any specific company. Such an approach disregards the historical trend analysis we have undertaken on each measure. It also assumes that there is equivalent upside and downside around the new performance commitment levels. This is clearly not the case. Our performance commitments are extremely challenging, and as such, have more downside scope than upside.
- 6.11 If we were to use the p10s from our April Submission, the package becomes increasingly skewed towards metrics that our customers do not highly value.

Figure 13: Common measures – DD with Thames's view of p10-p90s

- 6.12 As can be seen from the above, unplanned outages and water quality compliance would dominate the incentive package. We have updated our view of p10s and p90s, and include this updated view in our App26 submission.



The DD's ODIs create a strong negative skew

- 6.13 We note that nearly all of Ofwat's interventions on ODIs increase the downside and reduce the scope for any outperformance. The below table summarises the Ofwat interventions on our ODI rates.

Table 14: Ofwat interventions on our ODI rates compared with the April plan

	Reward rates	Penalty rates
Mains repairs	-	↑
Unplanned outages	Removed	↑
Interruptions to supply	-	↑
Leakage	↑	↑
Clearance of blockages	-	↑
Void properties	-	↑
Pollution incidents	-	↑
Acceptability of water to consumers	Removed	↑

Source: Thames Water April Submission; Ofwat's DD.

- 6.14 Ofwat's interventions have significantly changed the balance of our incentive package. For example, our proposed penalty rate for our Acceptability of Water to Consumers PC was £0.27 million per customer contact (per 1,000 population); while Ofwat has increased this to £8.35 million. Our ODI rate was developed based on extensive customer research, but in the DD, Ofwat provided no justification for its proposed rate.
- 6.15 In total, this has created a significant negative skew in the incentive package.

Table 15: ODI package impact on RoRE

PR14		April plan		Ofwat's DD		Our view of the DD	
P10	P90	P10	P90	P10	P90	P10	P90
-1.5%	+0.8%	-1.5%	+0.8%	-3.3%	+0.5%	-6.0%	+0.5%

Source: Thames Water analysis, PR14 final determinations and PR19 DD.

- 6.16 Even with Ofwat's view of p10s and p90s, the incentive package is heavily skewed towards the negative. We consider that a more balanced package would offer a fair degree of both rewards and penalties. However, under Ofwat's DD proposals, the only way we could earn any rewards would be to significantly outperform extremely ambitious performance targets.
- 6.17 At PR14, Ofwat explicitly directed companies to submit ODIs with meaningful rewards⁶⁴. The indicative range for ODI rewards and penalties that Ofwat set out in its final methodology for PR19 was in the range +/- 1% to +/- 3% RoRE⁶⁵. Our incentive package now falls outside that range, with lower scope for outperformance, and greater scope for penalties. Given this level of skewness, the baseline position would be for Thames Water to incur significant penalties during AMP7.

⁶⁴ Ofwat (2014) 'Setting price controls for 2015-20 – risk and reward guidance'.

⁶⁵ Ofwat (2017) 'Delivering Water 2020: Our final methodology for the 2019 price review'.



- 6.18 Further, we note that Ofwat's DDs for other companies also incorporates a downward skew. Ofwat has not justified why the sector should be exposed such a negative skew, nor has it reflected this expected level of penalties in setting the allowed cost of capital.

The DD's ODIs creates clear financeability risks

- 6.19 In Chapter 4, we outlined that the negative skew of the DD's ODIs contributed significantly to the non-financeability of the overall DD package of measures.

Request of Ofwat

- 6.20 In summary, Ofwat's interventions on our ODIs:

- a) **Do not reflect our customers' priorities:** This will result in the company being incentivised to prioritise activities that do not align to our customers' priorities;
- b) **Creates a strong negative skew:** This position is fundamentally different to the package we discussed with our customers, and does not align to previous guidance from Ofwat; and
- c) **Creates clear financeability risks:** The scale of downside is extreme and may result in the business not being financeable.

- 6.21 Therefore, we propose that the incentive rates set out in our April plan are adopted for the final determination, as these did not create the problems highlighted above. For further details on each of these specific measures, please refer to the individual sections below, and the outcomes appendix⁶⁶.

C RORE range

Introduction

- 6.22 In this section, we discuss the RORE range within Ofwat's DD and its implications for the risk and return balance.
- 6.23 In our April plan we flagged a concern over a potential disconnect between allowed returns and the level of risk at PR19 and we demonstrated that if the strength of ODI rewards and penalties is increased this will, all else equal, lead to an increase in systematic risk, increasing the rate of return required by investors⁶⁷.
- 6.24 In view of this concern we asked Frontier Economics to review the risk / reward balance in the DD. Frontier has advised us that Ofwat's allowed cost of equity is not consistent with the water company risk profile for PR19.

⁶⁶ TW-DD-A12-Outcomes.

⁶⁷ 'Towards a risk and reward framework for PR19: an exploration of the relationships between incentives, cost allowances and rates of return'. EY, March 2017.



RORE range – Ofwat's DD does not present a fair balance of risk and return

- 6.25 Ofwat's bottom-up estimate of the WACC provides a backward-looking view of the risk of the sector. To the extent that the risk profile looking ahead is different to the past, the estimate of the WACC will be inappropriate.
- 6.26 Undiversifiable risk may increase because of changes such as:
- An upward shift in performance required (from average to upper quartile) by companies to earn their cost of capital
 - A wider range of risk and reward; and
 - An increasingly skewed set of returns to the extent that the reward upside is restricted due to a relative lack of customer support.
- 6.27 As we evidence below, we think that all three elements noted above are true, pushing up undiversifiable risk and therefore the required cost of capital for the notional company, but counter-intuitively the allowed cost of capital has reduced in the DD (with the possibility of further reductions signalled).

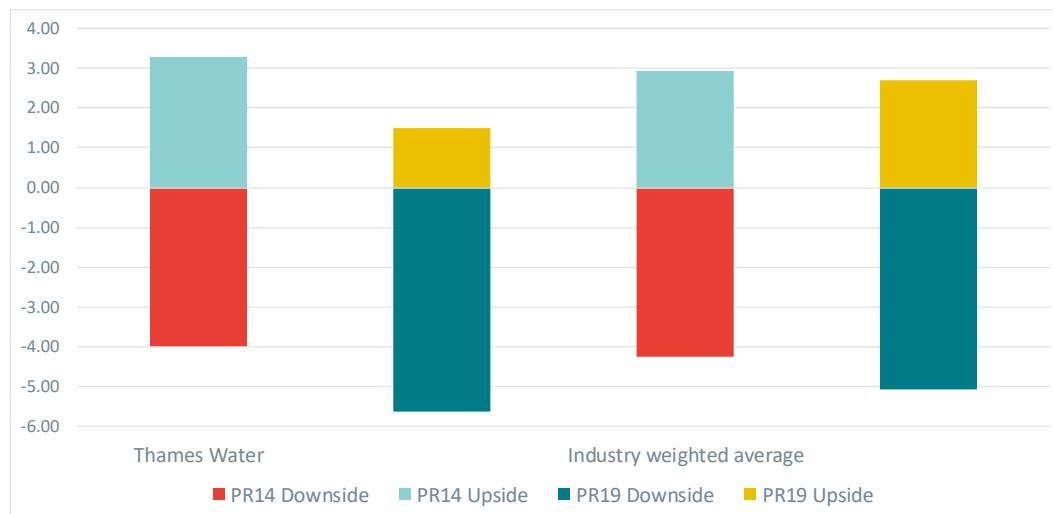
Upward shift in performance required (from average to upper quartile) by companies to earn their cost of capital

- 6.28 At PR19, Ofwat has adopted more stretching targets for cost efficiency and service performance than at PR14. Ofwat has stated that it is confident that an efficient company can achieve the targets. However, the methods used to set the targets are more stretching than at PR14, including use of forward-looking efficiency and performance frontiers.

Wider RoRE ranges, skewed to the downside

- 6.29 The figure below shows the upside and downside RoRE range for Thames Water and the industry as a financial exposure on mains whole, for the PR14 Final Determination and PR19 Draft Determinations. The figure highlights that Thames Water faces a risk profile much more skewed to the downside and also that the range of risk facing the industry has widened since PR14.

Figure 14: RoRE range – PR14 and PR19



Source: Ofwat Determinations, Frontier calculations.



- 6.30 The figure below shows that at the industry level the range has increased from 7.19% to 7.78%⁶⁸ and the negative skew in returns has increased from -0.67% to -1.20%.
- 6.31 These figures are based on a standard cost sharing rate of 50%. Ofwat has signalled that it will apply differential sharing rates to most of the non-fast track companies in the Final Determination. This will have the effect of decreasing the upside potential and increasing the downside potential. The overall effect will be to widen the RoRE range further.

Table 16: RoRE upside and downside

		PR14	PR19 DD
Industry	Upside	2.93%	2.69%
	Downside	-4.26%	-5.09%
	Midpoint	-0.67%	-1.20%
Range		7.19%	7.78%
Thames	Upside	3.30%	1.50%
	Downside	-4.00%	-5.63%
	Midpoint	-0.35%	-2.07%
Range		7.30%	7.13%

Source: Ofwat Determinations, Frontier calculations.

Allowed cost of equity does not compensate investors for increase and skew of downside risk

- 6.32 The other material change has been the reduction in the base level of returns, from 5.65% at PR14 to 4.21% within the PR19 DD. This is caused by the reduction in WACC, only partially offset by the switch to CPIH indexation for 50% of the RCV. The combined impact of the lower base returns and a greater RoRE range is an increased risk of very low equity returns over the next period.
- 6.33 The figure below illustrates this under two scenarios. First, assuming that downside returns are normally distributed with a mean equal to the base RoRE. Second, assuming that returns are normally distributed with a mean halfway between the P10 and P90 (i.e. the midpoint of the RoRE range). The table shows the probability that equity returns over the five years would be below 0%.

Table 17: Probability of RoRE return below 0%

	PR14	PR19 DD
Base RoRE	5.65%	4.21%
Mid-point of RoRE range	4.98%	3.02%
Probability of RoRE <0% assuming normal distribution around base RoRE	4.46%	14.46%
Probability of RoRE <0% assuming normal distribution around midpoint RoRE	3.84%	16.11%

Source: Ofwat Determinations, Frontier calculations.

- 6.34 This shows that the probability of a return on equity of less than zero has increased by a factor of around four. This calculation is illustrative and does not take account of non-regulatory risks.

⁶⁸ These figures differ slightly from the industry averages presented in Ofwat summary documents. These are based on the individual company ranges set out in the Ofwat company specific determinations, weighted by current RCV values.



Neither does it reflect Ofwat's more stretching approach to setting targets at PR19. It does however highlight the greater risk that equity investors are exposed to.

- 6.35 The wider RoRE range at PR19 will result in a greater variance of returns for equity investors. This would feed through into a higher asset beta unless it was the case that all of the additional risk was diversifiable. The CMA considered this argument in Bristol Water and concluded that it would be unrealistic to assume the additional risks were diversifiable. Therefore, it is reasonable to conclude that the forward-looking beta values for the sector would be increased as a result of the higher risk profile.
- 6.36 The asymmetry of the RoRE would also be a concern for investors, who require that expected returns should be at least equal to the WACC. Faced with a negative skew to expected returns, one option would be to set the rate of return above the WACC to compensate for this.
- 6.37 However, we consider that it is more appropriate to address this issue through the process for setting targets and incentives for totex and performance, rather than through an adjustment to the rate of return.

Implications for financeability

- 6.38 As we explored in Chapter 4, and repeat here, it is standard practice for regulators to undertake a financeability assessment of a proposed determination. For Ofwat, this assessment is relevant for achieving both its financing duty and the new duty to secure long-term resilience.
- 6.39 Ofwat has not applied sufficient 'stress tests' on financeability. The CMA Bristol Water (2015) decision stated that:

"We consider it good regulatory practice to consider the impact of downside shock on financial ratios."
- 6.40 Ofwat appears not to have undertaken any analysis of downside scenarios or 'stress testing' for the assessment of financeability or financial resilience at the Draft Determination. We think this is an important omission, particularly in view of the requirement for companies to consider financial resilience to a range of severe, reasonable and plausible scenarios, such as those common scenarios relating to inflation, bad debt, refinancing, and penalties – in addition to downside totex and ODI outcomes – which Ofwat sets out in its position statement on PR19 business plans.⁶⁹
- 6.41 Not only is this inconsistent with good regulatory practice outlined by the CMA but it is also a particular concern given the additional risk factors facing the industry at PR19.
 - The notional assessment (which assumes targets are met) is tighter than at previous controls, with less headroom within the band of investment grade ratings. Ofwat's assessment is more consistent with Baa2⁷⁰ than Baa1 or above;
 - The targets for service performance and cost efficiency are more ambitious than in previous controls. Ofwat considers that they can be met by an efficient company, but the

⁶⁹ Putting the sector in balance: position statement on PR19 business plans, Ofwat July 2018 – Section 8 Financial Resilience.

⁷⁰ For example, adjusted interest cover ratio in range 1.3 to 1.5, which is consistent with Baa2.



methods used to set the targets are more aggressive. At PR14 the cost allowance was based on upper-quartile assessment, but with no ongoing frontier shift efficiency. At PR19, Ofwat has combined upper-quartile assessment with a frontier shift of 1.5% per annum⁷¹ for wholesale and a forward-looking efficiency challenge for retail. For service performance Ofwat has introduced forward looking upper quartile assessment for some common measures, and more generally, has a greater focus on comparative benchmarking and stretching performance targets;

- Penalties for poor performance are more material. The RoRE analysis highlights that there is more downside risk and more downside skew on ODIs; and
 - The regulatory protections for underperformance have been weakened. For example, companies will, on average, have to absorb around 60% of any cost overspend, compared to around 50% at PR14.
- 6.42 Therefore, reasonable scenarios for underperformance on costs and service performance will place material risk on the financial resilience and ability to raise finance on reasonable terms. Ofwat's cost models and methods for setting performance targets are not perfect. This is to be expected, as no regulatory benchmarking method will give perfect results. Ofwat can point to the fact that since privatisation, companies have generally (though not always) met or exceeded the targets set of them. However, at a point where Ofwat will be applying more stringent methods for setting targets than previously, there is clearly a greater risk that the targets turn out to be unrealistic. Given this risk, it is vital to understand the impact of this scenario on the financial position of the companies.
- 6.43 For Bristol Water the CMA considered downside scenarios relating to overspend of totex. This resulted in worsening credit metrics, but the CMA identified three factors as protecting the company finances in the event of the downside scenario:
- **The headroom in credit rating above the floor of investment grade:** This factor is weakened at PR19 with the metrics consistent with a lower rating than previously;
 - **The 50% cost sharing rate for totex overspends:** This is also weakened with companies taking 60% of the risk on overspend; and
 - **The option to raise new equity:** This factor is untested, but there are reasons to consider that the sector is less attractive to equity investors than at PR14.
- 6.44 The fact that Ofwat has not undertaken stress-testing of the financeability position and in particular attempted to assess the impact of the higher risk profile that companies are exposed to at PR19 is an important omission. In our view it would be relevant to an assessment of whether Ofwat has satisfied both the financing duty and the resilience duty.

Request of Ofwat

- 6.45 We ask Ofwat to reconsider the balance of risk and reward within its FD, ensuring that totex allowances, PC target levels, ODIs and other incentive mechanisms are appropriately calibrated. This could be achieved through one or a combination of:
- Setting a higher totex allowance consistent with the ODIs in the DD;

⁷¹

PR19 draft determinations: Securing cost efficiency technical appendix, Ofwat (July 2019) – Table 6.



- Setting lower PC target levels and/or lower penalty rates consistent with the level of allowed totex in the DD; and/or
 - Setting a higher cost of equity in the WACC, to ensure that the notionally efficient company can earn its cost of capital, covering any remaining net downside skew in RoRE.
- 6.46 Calibration of the final package at FD can then be assessed by reference to the resulting RoRE ranges and financeability assessment to provide a final cross-check as to the adequacy of the allowed WACC to ensure that the notionally efficient company can secure a reasonable return on its capital. Financeability assessment should be extended to include 'stress testing' to ensure the resilience of its notional company to downside risks and any remaining downside skew at final determinations.
- 6.47 We provide separate assessment of the adequacy of Ofwat's allowed WACC to ensure that companies can earn returns equal to their cost of capital within Section D below.

D Cost of capital

- 6.48 The allowed cost of capital is a pivotal element of the price control, impacting bills and financeability. If set too high, customer bills will be higher than they need to be; if set too low it could put at risk the investment necessary to deliver the standards of service which customers expect.
- 6.49 The WACC which Ofwat has included in the DD is around 20 basis points lower than the 'early view' which is set out in its December 2017 methodology, which we used in our April Plan.
- 6.50 By contrast, our April Plan highlighted potential upward pressure of around 30 basis points on the WACC which would be required to correct for deficiencies in how WACC components were estimated in the 'early view'.
- 6.51 To better understand the significant difference in estimates for the AMP7 WACC we commissioned Frontier Economics to review in detail the basis of Ofwat's DD estimate. Frontier's report is appended to this submission⁷².
- 6.52 Frontier estimate an AMP7 WACC point estimate of 2.78% – towards the top of its 2.6% to 2.9% assessed range – for the appointee (in RPI-stripped terms) reflecting macroeconomic uncertainties, impacts of climate change and an increased risk profile in the regulatory methodology.
- 6.53 The differences between this view of the WACC and that set out in Ofwat's DD are driven entirely by differences in methodology. Frontier has extended its analysis to provide an updated estimate based on more recent market data, up to 31 July 2019. The impact of market movements since February 2019 is marginal (net effect just 1 basis point, where reduction in risk free rate and cost of new debt is offset by upward movements in asset betas).
- 6.54 For our business plan scenario, we have selected an appointee WACC of 2.6% which is at the bottom of Frontier's range in order to minimise the impact on customers, although this may not fully compensate investors for the increase in risk (referenced by RoRE ranges) compared to

⁷²

TW-DD-A01 Appendix 1 - Frontier Economics, Cost of Capital for PR19.



PR14. This estimate reflects the latest market rates up to end of July 2019.

6.55 In this section, we discuss the evidence presented by Frontier within its report for the:

- Cost of equity; and
- Cost of debt.

Cost of equity

6.56 Frontier's point estimate of the cost of equity for the water sector in AMP7 is 4.63% (real, RPI-stripped). Ofwat's DD assumption is over 100 basis points short of this, driven by insufficient allowance for risk free rates, total market returns and asset beta. We set out below a more detailed assessment of each component, with reference in each case to the evidence contained in Frontier's report:

- **Risk free rate (RFR):** Ofwat has changed its approach in the DD, and relies on the average of spot yields for 10- and 20-year index-linked gilt yields. Frontier disagrees with Ofwat's decision to change the method used to estimate the risk-free rate to index-linked gilts, as it does not find that there is sufficient evidence regarding the size of the inflation risk premium. Instead, Frontier use the six-month average of 15-year nominal gilts and consider that the RFR should therefore be -1.05% real (compared to -1.42% in the DD).
- **Total Market Return (TMR):** Ofwat is proposing not to focus on DGM analysis, but to put equal weight on ex-post, ex-ante and forward-looking approaches. While Frontier agree with this view, it estimates a slightly updated range of 6.5%-7.2% (in real CPIH terms). Frontier recommend a point estimate at the top of this range, having regard to regulatory consistency, reflecting the absence of evidence to support a material change from PR14, and to preserve neutrality from the switch from RPI to CPIH.

We note Ofwat's commitment to NPV-neutrality in its implementation of a CPI-based approach:

"Here we should also emphasise that in implementing a CPI based approach, we will commit to ensuring that the impact of this is neutral to both company (nominal) revenues and customer bills in net present value terms."⁷³

Frontier's recommended point estimate of the TMR is therefore be 6.16% in real RPI terms (compared to 5.47% in the DD).

- **Asset beta:** While Ofwat rely on a single point estimate in arriving at a raw equity beta, based on two-year daily data, Frontier recommend assessing the raw equity beta over shorter and longer time periods, and using varying data frequencies, to minimise any distortions in the betas which could be generated using a single point. This approach is in line with recent regulatory precedent.

Frontier also reviewed the EV/RCV gearing adjustment and the RAR versus RER adjustments, as proposed in Ofgem's December sector consultation, and conclude that neither is appropriate to be applied to the water sector cost of equity. It recommends that the traditional approach to the EV/RCV gearing adjustment is the most reasonable approach.

⁷³

'Water 2020: Regulatory framework for wholesale markets and the 2019 price review – Explanatory document', Ofwat, December 2015.



Frontier assess that the asset beta (including the debt beta) should therefore be 0.39 (compared to 0.36 in the DD) which in turn leads to an equity beta estimate of 0.79 (compared to 0.71 in the DD). This asset beta estimate sits within the CMA's range⁷⁴ of 0.375 to 0.525, whereas Ofwat's estimate falls below that range.

Cost of debt

6.57 Frontier's report demonstrates that the cost of debt for the water sector in AMP7, including issuance and liquidity costs, should be 1.55% (real, RPI-stripped). Ofwat's DD assumption is 21 basis points short of this, driven by lack of evidence of 'halo effect' for AMP7 and a higher ratio of embedded to new debt. We set out below a more detailed assessment of each component, with reference in each case to the evidence set out in Frontier's report:

- **Cost of debt 'halo':** For embedded debt, Frontier's methodology does not include the reduction from expected outperformance (the so-called 'halo' effect) on the cost of new issuance up to 2020, as it does not see sufficient evidence of its existence. Frontier also recommend an updated approach to estimating the forward uplift adjustment.

Similarly, for the cost of new debt Frontier has removed Ofwat's halo adjustment and applies an updated approach to estimating the iBoxx rate and forward uplift.

The evidence supporting a lack of halo effect is extensive, key elements being:

- CMA finding in its review⁷⁵ of British Gas in 2015 that there was no halo effect, although there may have been one before 2013;
- Analysis by CEPA in 2016 showed that from 2013 there was no longer a halo when looking at GBP nominal bonds⁷⁶;
- NERA review for Anglian Water⁷⁷ found that comparing A rated bonds directly with the iBoxx A rated index and B rated bonds with the iBoxx B rated index shows no evidence of a halo;
- Ofwat's early view of the halo was 15 bps and this relied on analysis by Europe Economics comparing iBoxx utilities and non-financial indices. However, according to subsequent analysis this estimate can be explained by differences in average ratings in the indices rather than outperformance⁷⁸; and
- Frontier disagree with Ofwat's use of a post-2015 average as part of their evidence because the average tenure of the bonds is around 15 years in the water sector. This volatility demonstrates how the time period chosen can significantly affect the results. Ofwat's analysis does not appear to take sufficient account of tenor and credit rating, as described above.

Frontier's view is that the iBoxx benchmark is not being used appropriately as a benchmark for the reasons given above, and that it does not provide sufficient evidence of an outperformance halo.

⁷⁴ The CMA's analysis in its reports on Heathrow and Gatwick (in 2007) assessed the asset betas for utilities to lie in a range of 0.30 to 0.45. Applying Ofwat's debt beta of 0.125 converts this to an asset beta range of 0.375 to 0.525.

⁷⁵ CMA - British Gas Trading Limited v The Gas and Electricity Markets Authority, Final determination. September 2015.

⁷⁶ CEPA - Alternative Approaches to Setting the Cost of Debt for PR19 and H7, August 2016.

⁷⁷ NERA - A response to Ofwat's halo effect for PR29: a report for Anglian Water, July 2018.

⁷⁸ NERA - cost of capital for South East Water at PR19, September 2018.



Further, any past halo existence does not guarantee that it will continue in the future and affect the cost of new debt, as noted by the CMA in their halo analysis for RIIO DE1.⁷⁹

This combined with the recent credit warnings on the water sector following the Draft Determination, the December final methodology and the “Back in Balance” consultation makes it even more unlikely that there would be any halo remaining in the water sector.

We also note that Ofwat’s notional company in the DD exhibits ratios more consistent with BBB/Baa2 than BBB+/Baa1 – evidenced for example by AICR below 1.5x. It would be counter-intuitive to expect a company with this rating to be able to outperform the 50/50 mix of A and BBB indices used in setting the allowed cost of debt.

- **Embedded debt ratio:** Frontier has used resubmitted business plan table data from April 2019 and finds a lower estimate of 16% new debt in comparison with that used by Ofwat at Draft Determination of 20%.

In combination with removal of the cost of debt halo this points to a real cost of embedded debt of 1.61% (before issuance and liquidity costs) compared to 1.46% in the DD. The real cost of new debt would be 0.63%, compared to 0.35% in the DD. In real, RPI-stripped terms, including issuance and liquidity costs, this equates to an overall cost of debt of 1.55%, compared to 1.34% in the DD.

Request of Ofwat

- 6.58 We request that Ofwat takes into account during its final determination the factors we have highlighted regarding estimation of the cost of equity and cost of debt which we assess to add around 40 basis points to the DD WACC for the appointed business in RPI-stripped terms. Our view of the required appointee WACC for inclusion in the final determination is 2.6% (real, RPI-stripped) – including effects of market movements up to 31 July 2019.
- 6.59 Ofwat should also review how it has calibrated the overall risk and return package within its final determination, ensuring that the allowed cost of equity is sufficient to compensate investors for the risks associated with the DD – which may be assessed by reference to P10/P90 RORE ranges.
- 6.60 We would expect to see a reasonably symmetrical balance of RORE upsides and downsides within the final determination. We would recommend that any significant downside skew within RoRE ranges should be resolved in the first instance through adjustment to the relevant incentive mechanism or totex allowances, rather than through the WACC.
- 6.61 The notional financeability assessment provides a means to sense check the allowed WACC and to take into account any skew in the RORE range – which is necessary to ensure that Ofwat can discharge its primary duty to secure that companies are able (in particular, by securing reasonable returns on their capital) to finance the proper carrying out of their functions.

⁷⁹

CMA - British Gas Trading Limited v The Gas and Electricity Markets Authority, Final determination. September 2015, p150 paragraph 8.54.



E PAYG

- 6.62 In line with our approach in our September 2018 and April 2019 business plans, we agree that it is appropriate to use the underlying natural rates as the basis for setting PAYG rates. However, the appropriate natural rate (calculated as the opex divided by totex) changes, and may be different, depending on the overall scale of the totex programme.
- 6.63 Based on our revised business plan scenario (overall totex c. £10bn) we have recalculated the PAYG natural rates. Revised PAYG rates are included in the set of data tables for the business plan scenario in data tables Wr4, Wn4, WWn6, Bio5 and Dmmy8.
- 6.64 Given that this business plan scenario primarily reduces the capex scope (see Chapter 7) the consequence for PAYG is to increase the natural rates compared to those in our April 2019 business plan.
- 6.65 As noted in the Executive Summary, our preferred business plan remains to deliver the additional capital improvements that our customers have supported. If the Final Determination differs from our business plan scenario, to ensure that the PAYG rates remain appropriate, the natural rates would need to be recalculated on the basis that the capex component of totex is adjusted, with opex remaining unchanged. This would ensure that the underlying opex is in line with fast money, in line with our customer preferences, to avoid future bill corrections.
- 6.66 We agree that in some circumstances it may be appropriate to overlay adjustments to the natural PAYG rate (i.e. in addition to the adjustments to the natural rate discussed above), for example where notional financial ratios are constrained. We agree that increasing the short-term cashflow is beneficial, to some extent, to some financial metrics⁸⁰.
- 6.67 While such an adjustment can improve some notional financial metrics, it does not address the more fundamental notional financeability issue:
- a) Given the implicit underperformance for the notional company for the combination of the totex allowance and performance commitment requirements in the Draft Determination, a notional company would not be able to earn its cost of capital; and
 - b) To address notional financeability requires both (i) ensuring key notional financial metrics are appropriate; and (ii) an appropriate calibration of totex and performance commitments / ODIs.
- 6.68 As discussed in Chapter 9 (and the supporting Appendix), our revised business plan scenario, including a wholesale WACC of 2.5% (RPI-basis), is notionally financeable without including an adjustment to the PAYG rates. Therefore, given such a wholesale WACC, we have not included any adjustment to the PAYG rates.

Request of Ofwat

- 6.69 If Ofwat adopts the totex in our revised business plan scenario, then we recommend Ofwat to also adopt PAYG rates consistent with the natural rate of the underlying totex, as identified in the business plan scenario data tables.

⁸⁰ We discuss notional financial ratios, including consideration of the pension deficit repair in the calculation of the notional financial ratios in TW-DD-A16, "Business plan scenario financeability assessment".

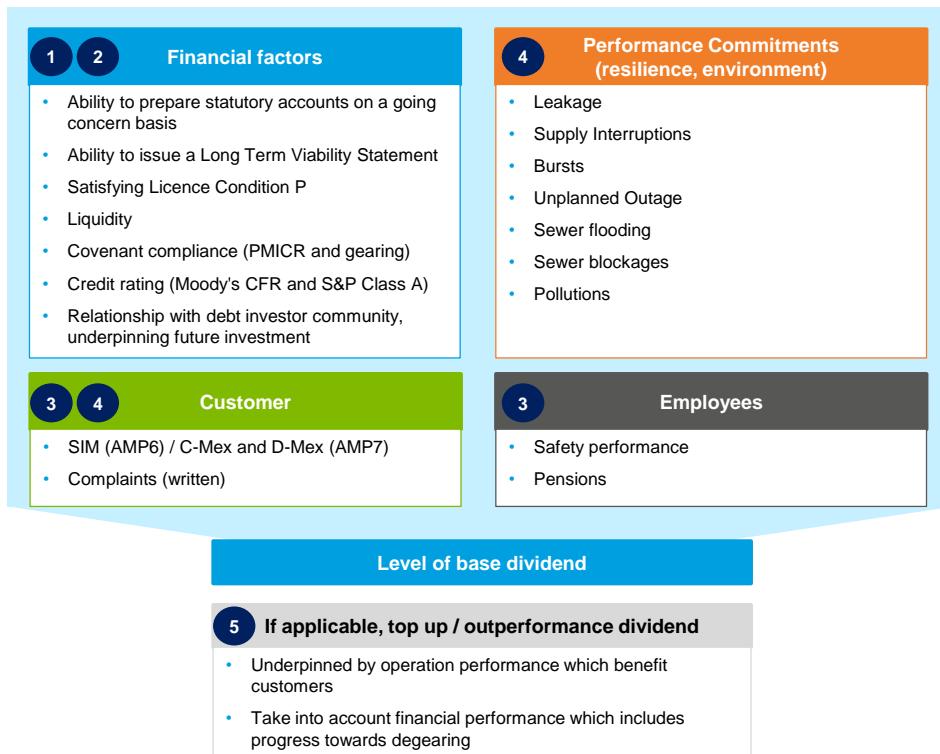


- 6.70 If Ofwat chooses to allow a totex different from our revised business plan scenario (for example the higher totex plan supported by our customers) we recommend Ofwat to recalculate the PAYG rates to reflect revised natural rates assuming the change in totex is solely due to a change in capex.
- 6.71 We recommend that Ofwat continue to review the notional ratios arising from such an approach. Where such ratios are below appropriate metrics then we recommend that Ofwat continue to use the PAYG rate to improve AMP7 cashflows.

F Distributions policy

- 6.72 In the April 2019 resubmission, we set out five conditions which would be applied when assessing the level of dividend to be paid. Taking into account Ofwat's feedback, we have outlined in more detail some of the specific factors which could be considered in the round when setting dividends. The diagram below shows the interaction between the five conditions and the various factors.

Figure 15: Overview of selected factors influencing dividends and interaction with overarching conditions



Note: CFR – Corporate Family Rating.



G Gearing sharing mechanism

- 6.73 We continue to disagree with the underpinning principles behind Ofwat's Gearing Outperformance Sharing Mechanism (GSM) and its design, as set out in our April 2019 Business Plan, our September 2018 Business Plan and in our response⁸¹ to Ofwat's original consultation on putting the sector back in balance⁸².
- 6.74 The key points of our objection being:
- We disagree with the implication that gearing above 65% implies a lack of financial resilience; no evidence is presented that the quantum of equity invested in TWUL, or other companies with gearing in excess of the current notional assumption, is inadequate to cope with the cost shocks that it might face;
 - Ofwat's GSM ignores a fundamental tenet of corporate finance theory: namely, that the cost of equity naturally increases as the ratio of debt to equity rises. Ofwat's GSM is asymmetric in that it seeks to reflect in prices, the interest rate benefits of securitisation arrangements but not the associated costs and risks to equity;
 - Notwithstanding statements to the contrary, Ofwat's GSM effectively abandons a long-standing regulatory principle that financial arrangements are a matter for companies, as the proposals severely penalise companies with capital structures that deviate materially from the notional gearing assumption;
 - Relative to other companies, Ofwat's GSM penalises highly levered companies with more efficient debt management (a lower actual cost of debt creates a bigger spread with the cost of equity, which turns into higher penalty); and
 - Major new regulation with a significant financial impact should include a reasonable transition period, to allow companies to mitigate the risk of that impact and respond positively to the incentives.
- 6.75 We think that Ofwat's GSM, which it now seeks to impose, will deter investment in Thames Water; and more broadly, it could compromise the long term investability of the entire sector which has been a critical component of attracting long term and low-cost capital into our industry. This could weaken investment and lead to reduced service levels, thereby harming the long-term interests of both customers and the environment.
- 6.76 However, we recognise the need to offer a fair deal to our customers and the regulator's right to set targets, as well as the incentives to achieve these targets. Accordingly, we set out in our April Plan a recommendation for amending the mechanism (if Ofwat was minded to impose a GSM) in the interests of customers (without prejudice to our objections to this approach in principle). Our recommended approach adopted a tiered sharing mechanism, with the penalty only generated for gearing above 70%.
- 6.77 We remain of the view that, in comparison to Ofwat's default mechanism, our approach has greater incentive properties to lower gearing at Thames Water, in customers' interests. Further, we also believe that adding tiers to a GSM is a more reasonable and fair approach, providing a clear incentive to de-gear to address concerns around financial resilience, in a more proportionate

⁸¹ TSD311-PR19: Letter to Rachel Fletcher Ofwat 26 July 2018.

⁸² Putting the sector back in balance: Consultation on proposals for PR19 business plans, Ofwat, April 2018.



way that efficiently reflects the transitional costs of adjusting capital structure:

- **Incentive properties:** We proposed to reduce gearing by the end of AMP7 in our April plan. The suggested tiered GSM features a reduced marginal impact below 75% gearing. This creates a greater incentive to stretch de-gearing below 75%, if such de-gearing becomes possible. The graduated steps in our suggested mechanism provide a reasonable transition glidepath to a lower gearing level. Equally, with an increasing marginal impact at 80% and above, we would be even further disincentivised from raising gearing during AMP7;
- **Furthering customer interests:** Customers benefit more from the incentive properties of intermediate stepping points, which encourages a realistic level of degearing over a five-year period, while retaining equivalent sharing for the element of gearing over 75% (and a greater benefit above 80%); and
- **More reasonable and fair approach:** Given the decrease in risk implied by lower gearing, we believe that it is reasonable and fair to expect a reduction in the marginal impact rate paid by shareholders, when they de-gear. Our approach has been developed to take into account the scale of degearing required to meet Ofwat's 70% threshold, which would require an additional £1.8bn of equity in the business, at a time of considerable uncertainty in the equity markets for utilities given the risks of re-nationalisation.

- 6.78 We have engaged further with our customers on this topic, they support our commitment to reduce gearing and the concept of incentivising us to do that. While customers struggled to engage with the detail of a sharing mechanism they did not strongly object to (nor strongly support) our recommended approach.
- 6.79 Whereas there were low levels of interest in how the GSM works, there were high levels of interest in how the proposed benefits to customers would be spent. Customers felt the majority of this financial benefit should be directly reinvested in the network, rather than contributing to lower customer bills.
- 6.80 Alongside our recommended GSM, we committed in our April plan to significantly degear and to simplify our corporate structure by reducing our intercompany loan. Subject to the outcome of the FD, we maintain our commitment to degear and reduce our intercompany loan within our business plan scenario.
- 6.81 On this basis, our business plan scenario assumes that by the end of AMP7 we would reduce gearing to 76.9%. We currently expect to deliver our de-gearing through the reduction of the intercompany loan. Our original intercompany loan of c.£1.97bn was reduced by c.£220m in April 2019, and we plan to reduce this further by c.£500m in AMP7, subject to acceptance of our business plan scenario at the FD. The specific amounts and timing of such reduction will be determined by market conditions, among other factors. As we continue on the long-term path of reducing leverage, we will consider options to further reduce the intercompany loan.

Request of Ofwat

- 6.82 We urge Ofwat to reflect on the key points of our objection to a GSM in principle, and not to impose a GSM. However, if Ofwat is minded to press ahead with a GSM, then we recommend that Ofwat accepts the alternative tiered mechanism which we put forward in our April Plan.



H Executive pay

- 6.83 As confirmed in our submission, Thames Water is committed to move in the direction of expectations set out in Ofwat's "Putting the sector in balance" position. This includes the following:
- **Design of incentives for AMP7:** The majority of targets across the Annual Management Bonus and LTIP have been set for the delivery of customer service (e.g. CMEX) or customer delivery (e.g. leakage, EPA) and not financial outcomes. Stretching performance has been set, with only performance above Company Business Plan attracting payment above 50% of maximum; and
 - **Revised Remuneration Policy:** In September 2019, the Remuneration Committee will review the Remuneration Policy. All aspects of the policy will be reviewed including the application of withholding periods, alignment of pension allowances to the workforce, elements of pay at risk and benchmarking. The outcome of this review will be published in the Directors Remuneration Report in 2020.
- 6.84 Thames Water has entered in to separate correspondence with Ofwat regarding these matters and will keep Ofwat updated with developments as appropriate.



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PART B: BUSINESS PLAN SCENARIO



Chapter 7

Business plan scenario

A Introduction

- 7.1 In this Chapter, we describe a variant of our April Business Plan, a scenario with lower totex, but with higher operational risk. We discuss:
- **Section B:** Listening to Ofwat – why we are offering a Business Plan Scenario;
 - **Section C:** Totex; and
 - **Section D:** Operational consequences of the business plan scenario.
- 7.2 The business plan scenario outlined in this Chapter reflects Ofwat's preferences for lower totex and a focus on additional stretch in specific common PCs. We offer this scenario in order to aid Ofwat's process – it does not reflect our preference for the AMP7 period, which remains our April Business Plan. The business plan scenario is a complete package of measures, including enhancement cases – some of which were rejected in the DD; together with changes to the ODI penalty structures.
- 7.3 The additional operational risk implied by this scenario is significant. Focussing on short-term performance gains increases the risk of major outages for both water and wastewater services to customers, as we are unable to fully address low probability high consequence risks. There is also an increased environmental risk, as our *lower cost, lower investment* scenario places less emphasis on 'slow-burn', sustainable long-term solutions. This scenario therefore offers a lower level of resilience in the round, as a consequence of reduced totex.

B Listening to Ofwat – why we are offering a Business Plan Scenario

- 7.4 We want to do what we can to meet Ofwat's PR19 policy objectives. In the DD, we have understood that Ofwat would like to reduce totex allowances from our planned level, while at the same time, stretching even further, the outcomes through even more ambitious PC targets.
- 7.5 Our April Business Plan balanced cost efficiency with stretching PC targets, while seeking to invest in our network – at a level of operational risk that was reasonable. More specifically, the plan took into account the current condition of our assets and cost efficiency, such that the implied improvements represented a plan to succeed, rather than one to fail.
- 7.6 However, given the challenge from the DD, we want to set out a scenario in which totex could be reduced further from our April plan. Therefore, we describe in this section what a low totex scenario would comprise – including the implied PC targets and ODI penalty rates. Importantly, we also describe the additional risk and consequences that this scenario would imply for its operational deliverability during AMP7.



C Totex

- 7.7 Our September Business Plan featured an ambitious programme of investment for the future of our operation, as well as significant cost efficiencies through a 13.6% reduction in average unit base opex per customer⁸³. Our April Submission responded to the challenge from Ofwat's IAP, as well as from customers and stakeholders, taking additional challenge to costs and PCs compared to the September Business Plan: specifically, through a further £400m efficiency in base costs and a further £157m efficiency in enhancement costs, while delivering better performance on pollutions, internal sewer flooding and supply interruptions, while stretching our leakage performance. As a result, the April Submission delivered a 22.5% reduction in average unit base opex per customer.
- 7.8 Ofwat's DD has set an even tougher target for cost reduction than our April Submission or even Ofwat's IAP. The table below shows the gap between our April Submission and the DD, normalised for the DD's distribution of cost items in base and enhancement cost categories, split out for our water, wastewater and retail businesses.

Table 18: Comparison of Ofwat's DD totex allowances, with our April Submission (2017/18 prices)

TMS April Resubmission vs Ofwat July DD	Wholesale base costs – botex (£m)			Enhancement Costs (£m)			Retail (£m)	Total (£m)
	Water	Waste	Total	Water	Waste	Total		
TW BP, Apr 2019	3,750	3,510	7,260	1,572	1,285	2,857	875	10,995
TW BP, Apr 2019 post-reclassification	4,172	4,312	8,483	1,150	483	1,633	875	10,991
Ofwat DD, July 2019	3,548	4,017	7,566	615	329	944	754	9,263
Gap (£m)	623	295	918	534	154	688	122	1,728
Gap (%)	14.9%	6.8%	10.8%	46.5%	31.9%	42.2%	13.9%	15.7%

Source: Ofwat's IAP and DD; Thames Water April Submission; Thames Water normalisation calculation and removing the rejected true-up mechanisms.

- 7.9 The DD set Thames Water a significant £1.7bn totex challenge, compared to our April Submission. Compared to spend in AMP6, the DD sets both a significant £800m totex challenge, plus a significant increase in outcomes levels that we discuss in the next section.
- 7.10 We have listened to the DD's totex challenge and want to respond positively. Our *lower cost, lower investment* scenario sets out a version of our plan with less totex – broadly meeting Ofwat's DD level of base costs for water and wastewater, as well as retail costs; with ambitious performance levels in most areas and improved service levels. The trade-offs we have had to make in developing this scenario include carrying an increased level of operational risk in our systems and sacrificing longer term sustainable investments over short term fixes which are more expensive in the long run. The table below sets out this *lower cost, lower investment* scenario, in comparison with our April plan and the DD.

⁸³

Normalised for power and rates; measured per property, from AMP6 to AMP7.



Table 19: Our business plan scenario, in comparison with Ofwat's DD totex allowances (2017/18 prices)

Business plan scenario vs Ofwat July DD	Wholesale base costs – botex (£m)			Enhancement Costs (£m)			Retail (£m)	Total * (£m)
	Water	Waste	Total	Water	Waste	Total		
Ofwat DD, July 2019	3,548	4,017	7,566	615	329	944	754	9,263
Business Plan Scenario**	3,566	3,914	7,479	1,212	510	1,722	831	10,032
Remaining gap	18	-103	-87	597	181	778	77	769
Remaining gap (%)	0.5%	-2.6%	-1.2%	49.3%	35.5%	45.2%	9.3%	7.7%

Source: Ofwat's IAP and DD; Thames Water April Submission; Thames Water normalisation calculation and removing the rejected true-up mechanisms.

* To allow a direct comparison with the DD, the above table:

- excludes grants or contributions, 3rd party services and pension deficit repair;
- excludes TTT costs;
- does not include the latest IFRS treatment of leases; and
- excludes any Strategic Water Resource capex.

**Base costs now include new development, new connections and addressing low pressure', which were previously classified as enhancements.

- 7.11 Reducing totex any lower than £10,032m as stated in the scenario would prevent us from achieving the stretching Common PC targets that we are proposing. At this totex level, the gap between the business plan scenario and the DD totex is significantly reduced, compared with the April plan.
- 7.12 This scenario meets Ofwat's base cost challenge for water, wastewater and retail. While there are consequences to consider on the additional operational risk implied by the scenario, we are pleased to be able to focus on the still substantial gap on enhancement totex.
- 7.13 In the April business plan, we had assumed £400m in additional efficiencies. We are pleased to share that we have kicked off a major Transformation Plan which includes the 2019 Organisational design initiative (OD) and several other initiatives to find a path to these opex efficiencies. This OD initiative has identified areas within the business, where headcount reduction is possible, by eliminating or simplifying processes, adopting an agile approach to accelerate programmes and implementing technology initiatives faster. The initiative is already enabling the business to remove c.450 positions from the organisation, which will lead to a permanent reduction in our opex for the future.
- 7.14 This OD initiative has not been easy to achieve and will lead to a number of our colleagues leaving the business in September 2019. However, we have taken the challenge to our opex efficiency seriously and have taken immediate action, ahead of the start of AMP7, to put the business on its best footing to take on the challenges of the next regulatory period.

D Operational consequences of the business plan scenario

- 7.15 The business plan scenario varies our April plan through reduced totex and stretched PC performance in a number of areas. It meets the totex challenge set out by the DD for wastewater and retail, with the exception of CRMB depreciation. It also meets the common PC target challenge for each wastewater PCs, by the end of the AMP.



- 7.16 We achieve this by the removal of maintenance expenditure from our April plan, which was originally intended to improve our baseline operational resilience to hazards such as dry and wet weather events. The scenario also removes elements of our plan that allow for more sustainable, long-term performance beyond AMP7.
- 7.17 Our *lower cost, lower investment* scenario focuses on short-term performance gains for the lowest totex possible, in order to meet the challenge of the DD.
- 7.18 However, there are significant consequences from reducing totex and stretching performance. In the section below, we explain the following consequences:
- Increased operational risk: Wastewater;
 - Increased operational risk: Water; and
 - Rationalised bespoke PCs.

Increased operational risk: Wastewater

- 7.19 For wastewater, in our April plan it was our intent to ensure long term resilience; drive down incidences of sewer flooding and pollution; move towards 100% compliance at our sewage treatment works and embed a system approach, working with partners and stakeholders to drive further efficiencies in our wastewater service.
- 7.20 In our *lower cost, lower investment* scenario, we have made a significant reduction to base investment resulting in key resilience projects being removed from scope and also underlying maintenance levels across treatment works and pumping stations being reduced to a level that does not keep pace with deterioration or the addition of new assets. The impact of this will result in a higher rate of asset failures; an increased risk of breaching our discharge consents and as a consequence of not increasing the level of resilience, there is a chance this could lead to more pollutions or increased operational costs to recover service.
- 7.21 Some examples are set out below, along with the consequences of the removals:
- **Electrical Programme:**
 - *In our April plan:* We allowed for the replacement of life expired electrical equipment that is already operating beyond its asset life at 67 waste sites; 38% of our transformer and 18% of our switchgear asset base are over 30 years old (11% of our transformers are over 50 years old). The majority of which are at our key London works and pumping stations;
 - *In our lower cost, lower investment scenario:* We are reducing the scope of our proactive remedial work on these ageing assets (switchgear; motor start panels; high voltage switchgear and transformer replacements) and reducing the replacement programme of low voltage motor control centres (MCCs) by 28%. Operating these assets for longer instead of replacing them; and
 - *The consequence of this change:* The operation of these assets significantly beyond their asset life will lead to an increased chance of a major failure at both treatment works and pumping stations, increasing the risk of pollution events and compliance failures and reducing our operational efficiency.



- **Mogden Storm Pumps:**

- *In our April plan:* We included investment to replace the storm pumps at Mogden Sewage Treatment Works. These pumps are now over fifty years old. When they fail, parts have to be specially made, which results in the pumps being out of service for long periods of time compared to a modern equivalent, decreasing our resilience during storm conditions;
- *In our lower cost, lower investment scenario:* We have removed the scope to replace these pumps, which will need to occur at some point in the future. In the meantime, we will continue with our current approach to maintaining these assets; and
- *The consequence of this change:* The risk of multiple assets being out of service at the same time will increase, leading to flooding in the catchment. Investment cannot be put back indefinitely and will need to be made in AMP8 to replace these critical assets.

- **Lots Road Sewage Pumping Station:**

- *In our April plan:* This pumping station is located in North London, serves approximately 250,000 residents and is nearly 100 years old, dating back to the original Victorian system. This high risk/critical station is powered by diesel pumps that are manually operated to manage storm flows. The station currently does not have the functionality to operate automatically and in times of storms relies on an operator to attend site and start the pumps which itself is a complex process. In our April plan, we had included investment to add resilience to this station by installing a permanent power feed to serve the station to provide an automated operation;
- *In our lower cost, lower investment scenario:* We are removing the totex investment to address resilience at Lots Road Sewage Pumping Station. We will continue with existing levels of manual operational response to restart in the event of failure and are therefore not improving the current level of resilience; and
- *The consequence of this change:* An absence of resilience at this station which has impacted our customers on a number of occasions previously. In May 2018, when a moderate to major rainfall event occurred, the process of having to manually start the station triggered 20 basement floods in the upstream catchment, something that would have been avoided had the station been automated with a permanent power feed.

- **Surface Water Management (SuDS):**

- *In our April plan:* Our intent was to protect 35,000 homes through our SuDS programme, as part of a longer-term sustainable and more environmentally focussed approach to reducing the risk of sewer flooding in homes and building resilience to wet weather;
- *In our lower cost, lower investment scenario:* We are having to reduce significantly our totex investment for Surface Water Management and focus principally on short term (in AMP) measures and reduce our ambition to build resilience to wet weather; and
- *The consequence of this change:* The impact to customers of this *lower cost, lower investment scenario* is that some 12,000 residential homes in AMP7 will not receive an improved level of flood resilience and the wastewater system's capacity to absorb



growth and deal with climate change in the longer-term will deteriorate, making it more likely that flooding and pollution will impact.

- **Growth:**

- *In our April plan:* Our intent was to ensure we had the capacity and headroom available in our network and at our treatment works to accommodate new development and address the forecast population increase of 600,000 in our area by the end of AMP7;
- *In our lower cost, lower investment scenario:* We defer necessary capacity expansion at some of our sewage treatment works, moving away from adopting the lowest whole-life cost solution to growth i.e. where we normally build sufficient capacity with each upgrade to meet the forecast population increase for ten years (fifteen years on our largest sites). We have reduced scope across 18 treatment sites where population increases are forecast to exceed the treatment capacity of these sites in AMP7 and we will be forced to manage growth with a shorter-term focus. This means building capacity to a shorter time horizon (5 years), reducing our 'maximum plant out of service' criteria and adopting operational fixes that may not be sustainable over the longer term; and
- *The consequence of this change:* There would be an increased likelihood of compliance failure at the 18 sites as we erode headroom and existing resilience levels are compromised. This will lead to an environmental impact in the rivers these sites discharge to.

- **Flooding:**

- *In our lower cost, lower investment scenario:* We reduced 'internal sewer flooding' by 20% over AMP7. In accepting the Upper Quartile performance target; internal sewer flooding would have to reduce by 32% over the same period. We are effectively at Upper Quartile performance in respect of incidences of hydraulic flooding and there is little scope with a region of our size of improving upon this position, we therefore would have to focus on 'Other Cause' flooding. Other Cause flooding would need to halve over AMP7 in order to meet the Upper Quartile performance; and
- *The consequence of this change:* Our April Plan entailed a blend of 'Traditional' and 'New Technology' (Sewer Depth Monitors (SDMs)) to deliver the 20% improvement in our plan. To achieve the Upper Quartile Profile we will be required to make greater use of SDMs as part of our move to network digitalisation. SDMs are starting to yield benefits, but this approach is not yet at a state of maturity anywhere in the industry to be used with confidence. Further, the scale of activity required, essentially a five-fold increase in SDMs, means that this scenario carries significant operational and delivery risks.



Increased operational risk: Water

7.22 For water, we have removed scope from our April business plan as set out below, impacting our ability to improve operational resilience in AMP7. Some examples are set out below, along with the consequences of the removals:

- **Trunk mains rehabilitation:**

- *In our April plan:* In December 2016, we experienced several high-profile trunk mains bursts that caused significant disruption and damage in central London. Since then, we have continued to improve our approach to reducing risks, following the HSE's As Low As Reasonably Practical (ALARP) approach and working closely with TfL. Our April business plan envisaged the replacement and rehabilitation of some of the highest risk lengths that have been identified from survey and planning activities to date;
- *In our lower cost, lower investment scenario:* We will remove research and development into more efficient trunk main rehabilitation, development of a pipe condition assessment tool and continued work to improve our ALARP understanding of consequence tool. Further to this, a level of our rehabilitation works will be reduced, increasing reliance on our survey and monitoring programmes; and
- *The consequence of this change:* The risk of a cold weather or a hot/dry summer period causing a major supply interruption remains unchanged and would not reduce marginally over time, and the improvement of our efficient targeting and rehabilitation of trunk mains would halt.

- **North East London Resilience scheme:**

- *In our April plan:* We continue to represent that the full scope of the North East London Resilience project in our April business plan is fully funded, as discussed in Chapter 5. This is because we have received significant customer and stakeholder support for the work. In the Draft Determination, Ofwat has not fully funded this programme – specifically the commencement of a new water treatment works to bolster treatment resilience in the area, as a back-up to Coppermills WTW;
- *In our lower cost, lower investment scenario:* We align investment with the Draft Determination, deferring work on the new treatment works to AMP8; and
- *The consequence of this change:* We would continue to operate with a growing risk of a major supply outage in North East London during the critical summer period, in the face of a growing population and major new development sites underway in the area.

- **Reduction in water treatment base maintenance:**

- *In our April plan:* We included a number of sizeable projects that were principally designed to improve headroom across a number of sites such that they could be taken offline without interrupting supply to customers or impacting water quality. This was to allow for planned outages and vital maintenance work to take place;
- *In our lower cost, lower investment scenario:* We remove a level of investment from London treatment, groundwater and other treatment works, so that our totex forecast falls more in line with historical spend and botex modelling; and
- *The consequence of this change:* We would continue to operate with limited headroom across many of our key treatment works, with the risk that planned



outages and associated maintenance activity have to be deferred. As our understanding of the underlying condition of many of our treatment processes diminishes (due to deferred planned outages), the likelihood of a major failure and service consequence increases.

- **High consequence assets:**

- *In our April plan:* In addition to our treatment works and pipes, we operate many other assets that have a low probability of failure, but a high service consequence were they to fail. These include raw water storage reservoirs, raw water tunnels and aqueducts that connect storage reservoirs to treatment works and service reservoirs that store treated water. Many of these were constructed in the Victorian era or earlier;
- *In our lower cost, lower investment scenario:* We have removed the majority of proactive maintenance of these assets; and
- *The consequence of this change:* While we continue to monitor the assets, we are operating with a growing probability of long-term outages that have the potential to severely impact customers' supplies or the quality of water supplied. This approach could also prove to be less efficient where any reactive intervention is required, as reactive work tends to cost more than planned proactive maintenance.

- **Upgrade of core IT systems:**

- *In our April plan:* We included the upgrade of a number of key systems to improve productivity and ensure ongoing application support from developers;
- *In our lower cost, lower investment scenario:* We defer the capital expenditure associated with these upgrades to beyond AMP7; and
- *The consequence of this change:* We run the risk of a loss of performance and prolonged outages, forgo productivity improvements and incur higher levels of operational expenditure in the short-term.



Chapter 8

Business Plan Scenario - Outcomes

A Introduction

- 8.1 In this Chapter, we outline our business plan scenario for PCs and ODI rates. We discuss:
- **Section B:** Overall approach to PCs and ODIs;
 - **Section C:** Leakage;
 - **Section D:** Supply Interruptions;
 - **Section E:** Unplanned outages;
 - **Section F:** C-MeX ;
 - **Section G:** Mains repairs;
 - **Section H:** CRI;
 - **Section I:** Other PCs; and
 - **Section J:** Consequences of the business plan scenario – Rationalisation of bespoke PCs.
- 8.2 There are a number of other measures where we are also proposing changes to Ofwat's DD. These are set out in the outcomes appendix⁸⁴. This Chapter provides details on the measures where we have the most material disagreements with the DD.

B Overall approach to PCs and ODIs

- 8.3 We have listened carefully to Ofwat's feedback and have been through a rigorous process to re-interrogate our delivery plans, demanding more ambition from our business regarding performance commitments.
- 8.4 In the vast majority of areas, we are proposing to step up to the challenge set out by Ofwat in the DD, and we intend to deliver a step-change in performance more ambitious than any five-year plan that has ever been delivered in the English and Welsh water sector to date.
- 8.5 The scale of this challenge cannot be understated. Across many different measures, we will see a radical improvement in performance. A summary of some of the key measures is shown in the table below.

⁸⁴

TW-DD-A12-Outcomes.

**Table 20: Comparison of PCs from our plans and Ofwat's DD**

	September business plan	April Submission	Ofwat's DD	Our response
Leakage	15% reduction (606MI/d to 509MI/d)*	20% reduction (636MI/d to 509MI/d)*	25% reduction (636MI/d to 477**MI/d)*	20% reduction (636MI/d to 509MI/d)*
Supply interruptions	6% reduction	20% reduction	72% reduction	43% reduction
Mains repairs	Steady	Steady	18% reduction	18% reduction
Per capita consumption	4% reduction	4% reduction	6% reduction	6% reduction
Unplanned outages	1% reduction	1% reduction	16% reduction	13% reduction
Internal sewer flooding	15% reduction	20% reduction	32% reduction	32% reduction
Clearance of blockages	13% reduction	13% reduction	17% reduction	17% reduction
Pollution incidents	18% reduction	30% reduction	30% reduction	30% reduction

Source: Ofwat DD; Thames Water September Business Plan and April Submission. Thames Water calculation.

* PR14 annual average methodology. ** Rebased for comparability with the April plan basis.

- 8.6 We have considered each of element of the PC/ODIs and in this Response, we propose movement to Ofwat's level (or movement towards this level) for most PCs; movement in the glide path of targets through the AMP; movement in delivery incentive penalty rate; and in a limited number of cases, we have added further items to allow us to reach more stretching outcomes. The table below summarises our proposal for each of the key PCs.

**Table 21: Our proposed approach on key PCs**

Measure	Ofwat DD 2024/25 target	Proposed Business Plan Scenario			
		2024/25 target	Glide path to 2024/25	ODI penalty rate	Other
Key areas of disagreement with the DDs					
Leakage (based on Ml/d AMP6 annual average methodology)	477* (25% reduction)	509 Ml/d (20% reduction)	Our April plan basis	✓	Reducing collar to 5%
Supply interruptions (mins per property)	3 mins	6 mins	DD glide path shifted upwards to reflect new end target	Our April plan basis	14mins, 42 sec collar (April plan basis)
Unplanned outages (% peak week capacity)	2.34%	5%	Straight line from 18/19 position similar to other companies	Non-financial ODI	True-down for specific related enhancements
Mains repairs (No. per 1k km of mains)	231.3	✓	Straight line from current position similar to other companies	Our April plan basis	
CRI (Index)	0.00	0.00	n/a	✓	Exclusion of metaldehyde
C-Mex	n/a	n/a	n/a	n/a	Proposing an alternative structure to the incentive, and other changes
Other measures*					
Per capita consumption (Litres/head/day 3 year average)	6.3% reduction	✓	✓	✓	
Metering	-	-	-	-	Rejected - duplication with other PCs
Acceptability of water to consumers (No. contact/1000 population)	0.6	✓	✓	Our April plan basis	
Internal sewer flooding (No./10k properties)	1.34	✓	New profile to reflect actions to meet Ofwat target	Our April plan basis	Exclusion for extreme weather; Collars as per our April plan basis
Blockages (Number)	62,500	✓	✓	Our April plan basis	Penalty collar to 120k
Pollution incidents (No. /10k of mains)	19.5	✓	✓	Our April plan basis	Reducing collar as per our April plan basis
D-MeX	n/a	n/a	n/a	n/a	We comment on the structure of the metric
Renewable energy generation (GWhrs)	517	✓	✓	✓	Remove cap/collar
Sludge treated before disposal (%)	n/a	n/a	n/a	n/a	Excluding untreated sewage exported to 3 rd parties for treatment
SEMD	100%	✓	-	AMP6 legacy PC, ODI rate same as AMP6; AMP7 rate related to project delay	Remove AMP6 legacy PC
Environmental measures definition (No. sites)	724	✓	✓	✓	Ability to update target based on EA agreed changes
Empty household properties (voids) (% of household properties)	✓	✓	✓	✓	-
Number of customers on the priority services register (% reached/actual/attempted contact)	7% / 50% / 90%	✓ / 30% / ✓	n/a	n/a	
Achieving British Standard BSI8477 for Inclusive Service Provision	✓	✓	Accreditation in 2020/21	✓	Drafting change on first year target

Source: Thames Water. ✓ = accepting DD target/basis; * Rebased for comparability with the April plan basis; ** Thames Tideway Tunnel PCs discussed in Appendix TW-DD-A10-Thames Tideway Tunnel.



8.7 We are only seeking to make representations in a limited number of areas where we consider the Ofwat challenge to be flawed, undeliverable, and/or not in the interests of our customers. These include:

- a) **Leakage:** Ofwat is proposing a reduction in leakage of 25% over AMP7. No company in recent history has delivered a level of leakage reduction near this level. We committed to a 20% reduction to 509 MI/d from 636MI/d, in our April Submission, on the basis of funding from an enhancement case. This will still be a challenging target to reach, but one we are prepared to accept, and will need to be funded in order to allow us to take the necessary steps. We maintain this commitment in this August Response.

In Chapter 5, we outline an illustration for Ofwat of the cost of measures needed to achieve the additional stretch to 25% reduction targeted in the DD, on the basis of an additional mains replacement and metering programme, funded to around an additional £300m to £350m investment;

- b) **Supply interruptions:** We are proposing a 43% reduction in supply interruptions to 6 minutes from current performance. Our target would be equal to the second strongest performer in the sector based on 2018/19 data (Wessex Water). This is a 30% reduction from our April Submission at 8.5 minutes, which, while we think is stretching, is achievable, given new operational changes.

We do not consider Ofwat's upper quartile target to be appropriate because it is based on what we consider to be unrealistic forecasts from some companies; it relies on companies measuring the target on a sufficiently comparable basis (and we have significant concerns in this regard); and Ofwat's approach makes no allowance for exogenous factors that may affect comparability in performance across companies;

- c) **Unplanned outages:** We do not consider Ofwat's target to be appropriate because it is based on unreliable data with the majority of the sector not being compliant with the reporting methodology, which means that there is significant scope for differences in reporting approaches. Given this uncertainty, we do not believe that this new measure is ready to be used to inform comparative targets with significant financial penalties attached. Therefore, we propose for this PC to be reputational, rather than financial.

Given this uncertainty, we have had additional time to review best practice reporting across other companies, which has allowed us to refine our operational plans and on this basis we estimate that we could stretch to 5% outage;

- d) **Mains repairs:** We accept the DD's 2024/25 target. However, we do not consider that the glide path that Ofwat has proposed for mains repairs to be achievable and so we propose a deliverable trajectory of targets earlier in the AMP;
- e) **CRI:** As currently defined, we consider that the CRI is too volatile to have large financial penalties attached. This can be rectified by excluding metaldehyde; and
- f) **C-MeX:** We have concerns about the comparability and the relative scoring of C-MeX, which impacts on its regulatory incentives. We propose that for the final determination, Ofwat completes the design of a metric and incentive that is based on the absolute improvement of each company.



C Leakage

- 8.8 Ofwat has challenged us to reduce leakage by 25%. We are concerned about this PC target level and while we cannot meet Ofwat's target outright, we propose both to meet our April plan 20% target to 509 MI/d (described here using the PR14 annual average methodology for consistency) and based on the funding set out in the water network enhancement appendix⁸⁵. In Chapter 5, we have also provided a range of costs to illustrate the totex impact of achieving Ofwat's 2024/25 25% reduction level. We also propose to normalise the collar in line with other companies.

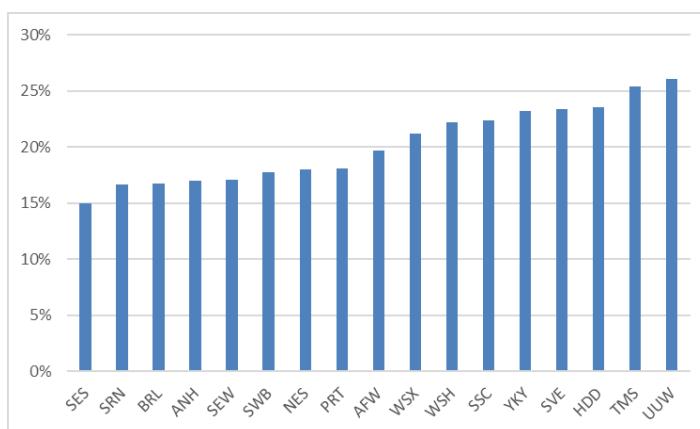
Performance commitment target level

- 8.9 The DD increased the stretch for leakage by 5% points from a 20% to 25% reduction, and termed the reduction on the three-year average basis. We are concerned about this decision in the DD for the following reasons:
- The DD appears to single out Thames for tougher treatment; and
 - Historical leakage performance for other companies has not displayed reductions at the levels proposed by Ofwat;

The DD appears to single out Thames for tougher treatment

- 8.10 We are concerned about Ofwat's approach to single out Thames Water for tougher targets on leakage reduction. Using Ofwat's traditional measure of leakage (leakage per km of main), we are an outlier with a higher level of leakage than other companies, given our asset age and geographic constraints. However, when leakage is viewed using alternative metrics, for example, leakage as a % of distribution input, then our performance is not an outlier.

Figure 16: Leakage as a % of distribution input



Source: Ofwat cost assessment tables average of five-year actuals, 2017-18 actuals for HDD and SVE.

⁸⁵

TW-DD-A03 water network enhancement cases.



Historical leakage performance for other companies has not displayed reductions at the levels proposed by Ofwat

- 8.11 The table below shows the absolute reported level of leakage, the annual reduction, plus the total reductions in AMP6 so far (FY15 to FY19) and across 8 years, for the larger and medium size companies.

Table 22: Historical leakage reduction across the sector (average annual ML/day)

	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	Actual reduction past 8 years
Large companies									
Severn Trent	464	441	441	444	434	432	439	424	-8.6%
	-5%	0%	1%	-2%	0%	2%	-3%		
Thames	637	646	644	654	642	677	695	690	8.4%
	1%	0%	1%	-2%	5%	3%	-1%		
United Utilities	453	457	452	454	452	439	454	456	0.7%
	1%	-1%	0%	0%	-3%	3%	1%		
Yorkshire	274	265	282	288	285	295	300	290	5.8%
	-3%	7%	2%	-1%	4%	2%	-4%		
Mid-sized companies									
Affinity	170	189	181	183	181	173	173	196	15.5%
	12%	-5%	2%	-1%	-4%	0%	14%		
Anglian	199	189	193	192	183	185	183	191	-4.1%
	-5%	2%	0%	-5%	1%	-1%	5%		
Welsh Water	185	185	184	180	180	175	173	170	-8.5%
	0%	-1%	-2%	0%	-2%	-1%	-2%		
Northumbrian	189	190	192	198	197	202	203	200	6.3%
	1%	1%	3%	0%	2%	1%	-1%		
Southern	82	81	85	82	84	88	103	102	24.2%
	-1%	4%	-3%	3%	5%	16%	-1%		

Source: Ofwat cost assessment models, 2018-19 annual performance reports and Ofwat data tables.

- 8.12 Over the last 8 years, no company has achieved a double-digit leakage reduction, let alone got close to a 25% reduction within a quinquennium.
- 8.13 There are a number of factors that specifically drive costs for Thames Water, and make leakage reduction more challenging. These include:
- Impact of clay soil;
 - Age of assets;
 - Proportion of metering; and
 - Proportion of joints driving leakage.
- 8.14 These factors are further detailed in Chapter 5, where we highlight the cost of achieving the 20% reduction to 509 Ml/d.



Request of Ofwat

- 8.15 We continue to commit to reduce leakage by 20% to 509 Ml/d and request that Ofwat fully funds our water network enhancement cases⁸⁶. Specifically, this includes the cases for leakage enhancement, metering enhancement and our London network maintenance cost adjustment claim.
- 8.16 In Chapter 5, we have provided a range of costs to illustrate the significant totex impact of moving from a 20% to 25% leakage reduction in AMP7. We remain committed to halving leakage from current levels by 2050. However, significant work in planning and targeting areas of our network with high leakage levels is needed before accelerating our mains replacement programme. We also need to explore partnership opportunities with other utilities and stakeholders to ensure that costs are kept to a minimum.

Delivery incentive collar

- 8.17 Ofwat's DD set a 10% collar relative to our baseline. We have two core concerns about this approach:

- **The collar results in an excessive exposure in relation to other measures:** Ofwat has effectively set a maximum penalty of £364 million or -1.2% RoRE across AMP7. Where RORE exposure has been greater than 1% for other companies, Ofwat's DD has reduced the relative exposure below 1%, in order to balance the incentives on the company to meet a wider range of regulatory imperatives. For Thames Water, our customer research confirmed that no single PC measure should dominate. Therefore, we believe that the DD's collar level exposure should be reduced. We propose that the collar should be reduced to 5%, which results in a RoRE across AMP7 of 0.9%; and
- **The DD's proposed collar for Thames Water is wider than the collars proposed for other companies:** The 10% collar for Thames Water is in excess of the collar set for other companies, as shown in the table below.

Table 23: Comparison of leakage collar levels

Companies with standard incentive rates	Annual AMP7 collar (% increase to 2019-20 baseline)
Hafren Dyfrdwy	Not material
Severn Trent	Not material
United Utilities	Not material
Affinity	5
Bristol	5
Portsmouth	5
South East	5
South Staffordshire & Cambridge	5
Southern	5
Welsh	5
Thames	10

Source: Outcomes performance commitment appendices for each company.

⁸⁶

TW-DD-A03 Water network enhancement cases.



Our proposal to reduce the collar to 5% is in line with Ofwat's standard approach for setting the collars for other companies; and

- **Thames Water appears to have been singled out for tougher treatment:** Given this excessive collar in relation to other companies, we are concerned that Thames Water has been singled out for tougher treatment. Given the collar rate set for other companies, we are proposing a collar at 5%.

Request of Ofwat

- 8.18 In conclusion, our proposed collar is 5% for each year of AMP7⁸⁷.

D Supply interruptions

- 8.19 Ofwat has proposed a 3 minutes target for supply interruptions by 2024/25. In this section, we outline our concerns about both the calculation of this target and its achievability. Following Ofwat's DD, we have further challenged ourselves on all areas of our plan. This has included a significant increase in the level of challenge for supply interruptions. We are now committing to a 43% reduction in supply interruptions from 2019/20 to 2024/25 to a 6 minutes target.

Performance commitment target level

- 8.20 Ofwat has proposed a target of 3 minutes for supply interruptions. We have concerns about the methodology used to reach the upper quartile target. Specifically:
- There are significant doubts about the achievability of company projections;
 - The methodology used by different companies is not comparable and invalidates the target;
 - Thames-specific exogenous factors that drive performance have not been considered.

There are significant doubts about the achievability of company projections

- 8.21 We are concerned that the projected target may not be credible or achievable, compared to their actual performance, for most of the companies that set the upper quartile benchmark. The table below shows both current and recent actual performance, with projected targets for 2024/25.

Table 24: Comparison of supply interruption performance

Company	Projected 2025 target proposed	Actual 2018/19 performance	Actual Best performance in the last 8 years	Actual Median performance in the last 8 years
Affinity	3:00	12:42	12:42	12:55
Bristol	1:48	15:01	12:34	22:19
Portsmouth	3:00	3:54	3:30	4:13
SES	2:06	16:06	3:14	11:31
Yorkshire	2:00	10:28	6:58	10:12
3 mins or below?	5 companies	None	None	None

Source: Ofwat data tables.

⁸⁷

Units: percentage reduction in leakage from initial level on a three-year average basis.



- 8.22 Only Portsmouth Water and SES have actual performance close to the upper quartile 3 minutes benchmark. SES was significantly distant from the target last year, in contrast to its best performance year. We also question whether Portsmouth Water or SES are truly comparable with the size and complexity of Thames Water and hence doubt that they should set the upper quartile benchmark for the industry.
- 8.23 The other upper quartile companies have put forward PC levels that they may not be able to achieve. For example, Bristol Water proposed levels below 2 minutes and Affinity Water proposed a target of 3 minutes; neither have ever achieved performance below 12 minutes in AMP6.
- 8.24 Questions about the credibility and achievability of these upper quartile targets imply that the targets may not be forecasts of future performance but attempts to set stretching UQ PCs within Ofwat's regulatory structure.
- 8.25 If the upper quartile benchmark for supply interruptions was set based on the actual performance for 2018/19, it would result in a **target of 8 minutes** - more than double the 3 minutes used in the DD.
- 8.26 We note that other companies have raised similar concerns:

a) **Anglian Water:**

"Ofwat has not made an assessment of the different methods that companies have used to forecast upper quartile performance, they have assumed that all are equally valid. This lack of scrutiny undermines the faith that customers can have in the process of setting common PCL".⁸⁸

b) **Severn Trent Water:**

"We're concerned about deliverability for supply interruptions on the basis of:

- *The variations in companies' forecasts of UQ in submitted plans;*
- *Biases associated with company specific factors; and*
- *Historical precedent"⁸⁹.*

c) **South Staffs Water:**

"We're concerned about deliverability for supply interruptions on the basis of: 'While it is not for us to determine whether other company's [sic] forecasts are realistic to achieve, and noting that volatile years can occur, we feel it is legitimate to question whether it is reasonable to allow forecasts not underpinned by a good track record to be used to drive industry targets given the scale of the financial incentive associated with the supply interruptions performance commitment".⁹⁰

The methodology used by different companies is not comparable and invalidates the target

- 8.27 Companies appear to use different methods to report their supply interruptions performance, while appearing to stay compliant with the Ofwat definition. For example, if a company were to

⁸⁸ Anglian Water (2019) 'IAP Response', page 140.

⁸⁹ Severn Trent Water (2019) 'Appendix 2: Delivering outcomes for customers', page 6.

⁹⁰ South Staffs (2019) 'Appendix RA07 Outcomes, performance commitments and ODIs', page 10.



use network telemetry to determine the start and stop times of a supply interruption, this would record materially longer interruptions than if the company simply used the time between the valves being turned off and on.

- 8.28 In the KPMG and Jacobs report on common PC for Ofwat and Water UK, the report recommended that:

“...companies should report on what proportion of their start/stop times has been informed by each data source (customer contact/pressure and flow data/modelled data/valve operation). This could help inform assessments of the validity of comparing different companies.”⁹¹

- 8.29 This data is not public domain. However, based on anecdotal evidence, we consider that companies may be taking materially different approaches, and urge Ofwat to review this data.
- 8.30 We have undertaken an analysis on our own data and note that if we were to use valve off and on times it would reduce our 2018/19 supply interruptions by 4 minutes (an improvement of 23% compared to our current methodology). This approach would be compliant with the measurement definition.
- 8.31 The differences in approach are also likely extend to property count, with methodologies ranging from no modelling being undertaken, to extensive hydraulic modelling being used to determine the number of affected properties (as we do).
- 8.32 Clearly, the way that supply interruptions are recorded has material implications for establishing a common measure that is appropriate for all companies.
- 8.33 The 4 minute impact to our own reported figures for 2018/19 supply interruptions (reducing our reported performance from 19 minutes to 15 minutes) demonstrates the materiality of differences in reporting methodologies, as can be seen from the table below.

⁹¹

KPMG and Jacobs (2017) 'OFWAT and Water UK – Targeted review of common performance commitments', page 113.

**Table 25: Comparison of SI3 reporting methodologies**

Trigger	Reporting methodology assumption	Unit	Thames Water SI Methodology 2018-19	If we used other methodologies 2018-19	% reduction
Valve closure as source of start time	Consistent	hr	139,431	139,431	0%
Strategic asset supply interruptions (ex. Water treatment works)	Consistent	hr	369,520	369,520	0%
Distribution mains interruptions	Inconsistent	hr	245,718	44,610	-82%
Customer Call as source of start time	Inconsistent	hr	131,614	61,991	-53%
Customer Specific outside stop value and leakage find and fix related	Inconsistent	hr	69,679	57,478	-18%
Non-standard interruptions (for example those raised by a Contractor or NST form)	Not considered	hr	269,921	269,921	0%
Total		hr	1,225,883	942,950	-23%
Number of connected properties		nr	3,879,994	3,879,994	
Average minutes per connected property		min	18.96	14.58	-23%

Source: Thames Water analysis.

- 8.34 We note that there are other areas of measurement uncertainty in companies' reported figures as noted in the shadow reporting commentary⁹², for example:
- a) *Company A has triggered an SI when the first no-water call is received or when the main is isolated. Modelling data is also used where available, however the limited number of monitoring points on the Company's network means that modelling is used infrequently;*
 - b) *Company B property counts are calculated for all shut downs, a GIS trace is run and all supply points highlighted;*
 - c) *Company C use customer contacts and valve isolation only;*
 - d) *Company D methodology source information from shadow reporting suggests most start and stop times determined by when the main is isolated, which is 94% of their data; and*
 - e) *Company E use data provided straight by their field technicians and service partners on when the supply began and ended.*
- 8.35 Variations in the source of data used to report supply interruptions may still be considered compliant with the Ofwat guidance. In the KPMG and Jacobs report on shadow reporting, nearly all water companies were reporting amber and red status against their compliance with the common PC definition for supply interruptions. It is unreasonable to set the same target for all companies regardless of their different reporting methodologies.
- Thames-specific exogenous factors that drive performance have not been controlled for*
- 8.36 We are concerned that the benchmark does not control for Thames-specific exogenous factors. At PR14, we made the representation that the comparative assessment for supply interruptions did not consider regional specific circumstances. Ofwat accepted our proposals at PR14 on the basis that we were already performing at upper quartile⁹³.

⁹² Water UK methodologies for Supply interruptions, 2015.

⁹³ PR14 Final Determination Company Specific Appendix: Thames Water, page 162.

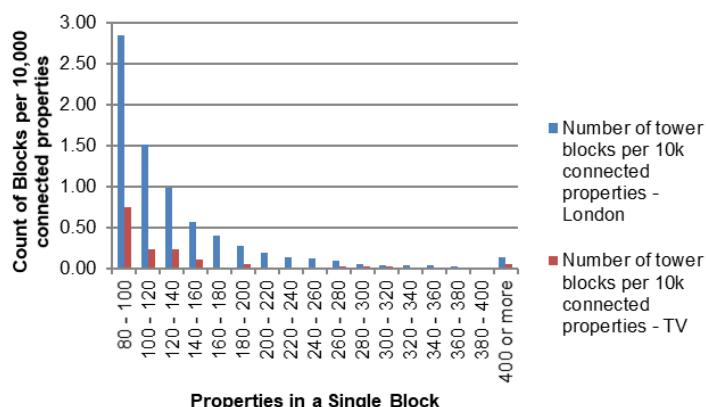


- 8.37 It remains the case that we operate in the most highly urbanised city in the sector, and indeed, in Europe. There are specific challenges that affect our supply interruptions performance, including:
- The highest density of properties in the country:** Therefore, the highest risk to interruption;
 - The slowest moving traffic in the London region:** Delaying the response time to interruptions; and
 - The oldest asset base in the sector:** Thus leading to a higher than average number of asset failures which could potentially cause supply interruptions.

The highest density of properties in the country

- 8.38 We have the highest density of connections in the sector with an average 122 connected properties per km of main compared with an average of 75 connected properties for WASCs. This means that when there is an asset failure, a greater number of properties are affected than if we operated in a more typical operating environment.
- 8.39 The difference becomes even more pronounced when we consider London, where the average number of properties affected by a supply interruption incident is 65 versus 45 in the Thames Valley in 2018/19⁹⁴.
- 8.40 This is driven in part by the prevalence and size of tower blocks in London when compared with Thames Valley, as can be seen in the figure below.

Figure 17: Prevalence and size of tower blocks in London vs Thames Valley



Source: Thames Water analysis.

- 8.41 Further, because of the urbanised environment in which we operate, we are more affected by traffic congestion. This can affect how quickly we can get to an incident, and fix the problem, thus extending the length of supply interruptions, as shown below:

⁹⁴

Thames Water Internal Reporting; Supply Interruptions Download - SI3 checker 18-19.

**Table 26: Comparison of supply interruptions between London and the Thames Valley**

	Avg properties affected per incident (nr)	Avg incident duration (hours)	Supply interruption per connected property (minutes)
London	65	7.44	11.61
Thames Valley	45	6.98	6.34

Source: Thames Water analysis.

- 8.42 In terms of urbanisation, our Thames Valley region is broadly comparable to the rest of the sector. If we were to consider property numbers by mains length as a measure for urbanisation, there would be four companies with a lower density than our Thames Valley region (i.e. it is more rural than average but is broadly within the pack). When we consider our London and Thames Valley regions together, we have the highest property count per length of main in the sector. Therefore, we consider the operating circumstances differences above are material when compared to the rest of the sector.
- 8.43 This difference in operating circumstances was reflected by Ofwat (to some degree) at PR14, where Thames Water was allowed a variation to the standard supply interruption measure. Instead of counting interruptions greater than three hours, Thames Water had a bespoke measure of interruptions greater than four hours.

The slowest moving traffic is in the London region

- 8.44 The impact of traffic congestion can be seen by the traffic delay information published by the department of transportation and updated in June 2019. In simple terms, the congestion results in about 40 minute delay to a 20 mile journey in London.
- 8.45 It is also important to note that the amount of delay is increasing at a materially higher rate for London than anywhere else in the country. This means that the target for supply interruptions is inevitably more challenging for Thames Water where it is set at a common level across the industry.

Figure 18: Average delay to local traffic in seconds per vehicle per mile

Country/region/local authority	ONS area code	Average delay (spvpm) ^{1,2,3,4}				Change in last year ^{5, r.} %
		2015	2016	2017	2018	
ENGLAND	E92000001 (921)	44.6	45.9	46.9	47.3	0.8%
NORTH EAST	E12000001 (A)	30.1	31.4	32.8	33.0	0.7%
NORTH WEST	E12000002 (B)	49.5	50.9	53.9	53.8	-0.1%
YORKSHIRE AND THE HUMBER	E12000003 (D)	39.5	40.1	41.1	42.1	2.5%
EAST MIDLANDS	E12000004 (E)	31.4	32.1	33.7	34.6	2.6%
WEST MIDLANDS	E12000005 (F)	41.0	41.4	43.4	44.6	2.8%
EAST OF ENGLAND	E12000006 (G)	30.3	31.8	32.7	32.9	0.9%
LONDON	E12000007 (H)	98.9	100.8	101.9	116.7	14.5%
SOUTH EAST	E12000008 (J)	35.4	36.6	37.5	37.6	0.4%
SOUTH WEST	E12000009 (K)	32.0	33.2	33.7	34.3	1.9%

Source: DfT Travel Time Data

Notes

1. Delay is calculated by subtracting derived 'free flow' travel times from observed travel times for individual road sections. Free flow travel times are calculated using the 85th percentile speed observation for each individual road sections. These are 'capped' at national speed limits.
2. Average delay is calculated by aggregating delay estimates from individual road sections and weighting observations by associated traffic flows so that it is representative of traffic volumes.
3. Travel time observations used to calculate this measure are derived from cars and light vans data only.
4. All day average delay calculated across the complete 24 hourly period and includes all days (weekdays, weekends, bank holidays etc.)

Source: Department for Transport; CGN0502: Average delay on local 'A' roads: monthly and annual averages.

- 8.46 In addition to the expected delay to travel, the average speed of traffic is significantly slower in London than anywhere else in the country, as shown in the DfT information below.

**Figure 19: Average speed on local A roads by local authority in England, annual from 2015**

Country/region/local authority	ONS area code	Average speed (mph) ^{1,2,3}				Change in last year
		2015	2016	2017	2018	
ENGLAND	E92000001 (921)	25.5	25.2	25.2	24.9	-1.3%
NORTH EAST	E12000001 (A)	30.0	29.6	29.1	28.9	-0.6%
NORTH WEST	E12000002 (B)	23.4	23.1	22.8	22.7	-0.3%
YORKSHIRE AND THE HUMBER	E12000003 (D)	26.2	26.0	26.0	25.6	-1.8%
EAST MIDLANDS	E12000004 (E)	29.8	29.5	29.3	28.9	-1.3%
WEST MIDLANDS	E12000005 (F)	26.3	26.1	25.9	25.5	-1.4%
EAST OF ENGLAND	E12000006 (G)	31.3	30.8	30.7	30.5	-0.9%
LONDON	E12000007 (H)	16.6	16.3	16.4	14.5	-11.3%
SOUTH EAST	E12000008 (J)	28.5	28.1	28.2	28.0	-0.5%
SOUTH WEST	E12000009 (K)	29.0	28.6	28.6	28.3	-1.0%

Source: DfT Travel Time Data

Notes

1. The measure weights speed observations from a sample of vehicles by associated traffic flows so that it is representative of traffic volumes on the roads in different locations and at different times of day.
2. Travel time observations used to calculate this measure are derived from cars and light vans travel time data only.
3. All day average speed calculated across the complete 24 hourly period and includes all days (weekdays, weekends, bank holidays etc.)

Source: Department for Transport; CGN0502: Average speed on local 'A' roads: monthly and annual averages.

- 8.47 With an average speed of 14.5 miles per hour, it shows that **it will take Thames Water over 80 minutes to travel 20 miles** to get to the site of a burst. With the distance across London being about 45 miles, this still requires teams with the necessary skills to be located either centrally or on either side. In reality, the burst may require specialist technical expertise, and with a journey any greater than 20 miles this reduces the likelihood of returning customers into supply in less than 3 hours.
- 8.48 From these figures, London clearly has the worst traffic congestion issues in England. In the additional regional information that can be accessed from the DfT tables, it can be seen that Reading and Slough suffer similar performance to London in terms of both average delays and average speeds on local 'A' roads.

The oldest asset base in the sector

- 8.49 Our supply interruption performance is also, to some degree, impacted by the condition of our assets, which are proportionately the oldest in the industry. We are the only company to have more than half of our network built before 1940. While asset age is not the sole driver of mains bursts (other factors such as topography, asset configuration, soil types, etc. also impact), it is a contributing factor. The greater the number of bursts, the greater the potential scope for supply interruptions. Thames Water has the highest number of mains repairs in the sector, reflecting our historical asset base.

Delivery incentive

- 8.50 In our September Business Plan, we explained that a collar was appropriate for this ODI because our historical data shows clearly that this metric is highly volatile to weather and exceptional events.
- 8.51 We do not consider that it would be appropriate for the incentive mechanism to excessively penalise companies for severe weather and exceptional events that are beyond management control. When asked about whether we should apply caps or collars to underperformance and outperformance payments, customers tended to support this. Customers recognised the significance of extreme weather events to this measure and thought it would not be fair to penalise Thames Water for such events.



- 8.52 In April, we proposed a collar at P10 which for 2020/21 was 14 minutes and 17 in 2020/21, reducing to 12 minutes and 6 seconds by 2024/25. We proposed the collar well above our historical range of performance. If supply interruptions above this level occurred, it would be most likely be driven by a major event, and the customers affected would be compensated through GSS payments.
- 8.53 The DD proposes to set a much higher collar of 21 minutes and 36 seconds. This is not based on historical volatility analysis of our operating region.

Request of Ofwat

- 8.54 We are proposing an ambitious target to significantly reduce supply interruptions in our area. However, we consider that the 3 minutes target proposed by the DDs is neither credible, based on robust comparisons, nor delivers value for our customers. We therefore propose that for the final determinations, Ofwat accepts our revised proposal of 6 minutes, which is based on a 30% improvement from our April Submission commitment at 8.5 minutes.
- 8.55 The penalty rate proposed in the DD is not based on customer research. We therefore propose that Ofwat reverts to the penalty rate (£1.70 million per minute) included in our April Submission for the final determinations.
- 8.56 The underperformance collar proposed by Ofwat is disproportionately high.
- 8.57 We have applied a consistent approach to our calculation of performance commitment caps and collars, which is to base these numbers on our P10 and P90 performance levels. This approach results in the caps and collars proposed in the following table. This approach is consistent with our April submission and has been updated to reflect our more ambitious target.

Table 27: Proposed supply interruptions caps and collars for AMP7

	2020/21	2021/22	2022/23	2023/24	2024/25
Target	00:08:24	00:07:48	00:07:12	00:06:36	00:06:00
Collar	00:11:48	00:10:59	00:10:17	00:09:22	00:08:32
Cap	00:03:00	00:03:00	00:03:00	00:03:00	00:03:00

Source: Thames Water analysis.

- 8.58 We acknowledge that the SI collar published in our DD remains flat across the AMP, and that companies have been consistently challenged by the imposition of a flat collar across the industry. While we still feel strongly that this flat collar does not appropriately recognise risk attributable to improving performance year on year, we are also mindful of the benefits that come from a simple and consistent approach to performance incentives.
- 8.59 In recognition of this we would be willing to accept a collar for SI fixed at 14 minutes and 40 seconds for each year of AMP7. This is broadly consistent with our 2020/21 collar proposed in our September submission (14 minutes, 42 seconds), our April submission (14 minutes, 17 seconds), and with the collar applied to comparable peers including Severn Trent and United Utilities in their Draft Determinations. We consider that 14 minutes 40 seconds is above our average historical range of performance and consistent with our customer preference to mitigate severe weather events.



E Unplanned outages

- 8.60 Unplanned outages is a new measure, for which there is limited historical data available. Our April plan proposed an improvement from 18% outages, to 17%. Ofwat's DD proposed a target of 2.34%, removed the outperformance rate, and increased the penalty rate by an order of magnitude.
- 8.61 Given this uncertainty, we have had additional time to review best practice reporting across other companies, which has allowed us to refine our capital maintenance plans and on this basis we estimate that we could stretch to 5% outages. However, we cannot accept the target of 2.34% (as there would be zero chance of us achieving this), and the inordinate penalty rate. Given the uncertainty surrounding this metric, we are proposing that this metric should no longer be a financial target, but remains a reputational target of 5%, with an associated delivery incentive where we hand back the £77 million to our customers if we do not deliver the associated schemes which Ofwat has funded. We consider that this is a more balanced approach that recognises the uncertainty that currently surrounds this measure.

Performance commitment target level

- 8.62 We have concerns about Ofwat's approach to the PC target level because:
- The metric is based on unreliable data arising from:
 - Companies being largely non-compliant in their reporting against this definition, which was materially updated as late as April 2019; and
 - There is substantial variation in interpretation of the definition;
 - The metric does not take into account company-specific supply systems and customer preferences.

Unreliable data: Companies are largely non-compliant in their reporting against this definition, which was materially updated as late as April 2019

- 8.63 Unplanned outage is a new measure that reflects a significant change in approach and has been refined several times since it was first introduced and last changed in April 2019. Companies have only been reporting performance and compliance against the measure in shadow reporting since 2017.
- 8.64 Companies remain largely non-compliant with many aspects of the new definition (see below) and consequently the reported performance is unreliable and does not form any basis on which companies can be benchmarked. The table below demonstrates the number of non-compliant areas reported by companies in 2019.



Table 28: Summary of 2019 Shadow Reporting RAG assessment of compliance with unplanned outage definition by sub-component⁹⁵ (out of 12 sub-components)

Company	Number of 'ambers' (i.e. semi-compliance)	Number of 'reds' (i.e. non-compliance)
Anglian	6	-
Hafren Dyfrdwy	4	-
Northumbrian	-	7
Southern	2	-
Severn Trent	5	4
South West		Data not available
Thames	3	4
United Utilities	6	-
Dŵr Cymru	-	-
Wessex	6	-
Yorkshire	5	2
Affinity	5	-
Bristol	-	-
Portsmouth	2	-
SES	2	-
South East	6	-
South Staffs	5	-

Source: Shadow Reporting 2019, table 3S.

- 8.65 As can be seen from the table above, we are aware of only two companies (Dŵr Cymru and Bristol Water) that are reporting full compliance with the definition; while other companies are largely non-compliant, so far.
- 8.66 In their review of the new common definitions for Ofwat in 2017, KPMG and Jacobs highlighted that the level of maturity of reporting against the new definition was not sufficient to set targets with a financial incentive. The report concluded [emphasis added]:
- “...the measure is still at a very early stage of development and our view is that meaningful comparative assessment is not currently possible. We recommend that a period of shadow reporting is undertaken to bed in the new guidance and that there is a further review of the PC guidance and definition during AMP 7”;*
- “This metric will not be at a suitable stage of development to be consistent for the start of AMP7 and we recommend further development of the metric and shadow reporting.”*
- “...comparative assessment and benchmarking of unplanned outages will not be possible across companies.”⁹⁶*
- 8.67 Given that companies are not expecting to be compliant with the definition until 2020, they will not be able to estimate the impact on projected numbers from the changes needed to become compliant. Therefore, setting a comparison-based target is patently not robust.
- 8.68 The lack of confidence from companies in their measures is further illustrated by what different companies said in their business plan submissions, as quoted in the table below.

⁹⁵ In the reporting guidance, an element is assessed as amber if there has been partial implementation of the guidance or data is not fully robust. Red is for element that have either not been implemented or for which the data has significant weaknesses.

⁹⁶ KPMG and Jacobs (2017) 'OFWAT and Water UK: Targeted review of common performance commitments', pages 4-6.

**Table 29: Quotes from different companies about the unplanned outages PC**

Company	Quote	Reference
Anglian	As this is a new measure we are developing our understanding of our performance. Our forecasts are based on maintaining the 2017/18 level of performance.	Anglian Water: PR19 Appointee Data Tables Commentary, page 5.
Hafren Dyfrdwy	Until we better understand our performance against this measure, our target for AMP7 is to maintain stable performance.	Hafren Dyfrdwy: PR19 business plan, page 156.
Severn Trent	Until we better understand our performance against this measure, our target for AMP7 is to maintain stable performance, given at current levels of performance we have demonstrated no deterioration to the water supply service that customers receive due to a loss of production capacity.	Severn Trent: A3: Designing performance commitments, page 118.
Northumbrian	As this is a new measure, we need to build up a full data set to understand how we perform in 2018/19 and 2019/20.	Northumbrian Water: Living Water – Our Plan 2020-25 and beyond, page 112.
Dŵr Cymru	Unplanned outages is a new measure and the lack of historical data would make it difficult to calibrate appropriate outcome delivery incentives.	Dŵr Cymru: Ref 5.5 PR19 Outcome Delivery Incentives, page 6.
Yorkshire	Unplanned outage is not something we have measured previously, so while we have a very good understanding of our historical production volumes, we cannot retrospectively categorise the unplanned outage volumes at the level of detail required by this performance commitment. Using the best data available to us we have had to estimate our forecast performance in the period 2020-25. Once we have completed two years of shadow reporting of the measure, we will have a much better understanding of our current performance and may have to review these targets retrospectively.	Yorkshire Water: Our PR19 Plan, page 129.
Bristol	As this is an asset health metric that has no reliable historical performance information to compare ourselves to, we have set our service levels for AMP7 based on the expert knowledge of Bristol Water staff.	Bristol: Water for All, page 137.
Portsmouth	Finally, we do not propose a financial ODI for unplanned outage. At this stage of its recording, we have very little data to set a target. In addition, customers did not see that a reward / penalty were appropriate for this measure – as it did not (necessarily) affect them directly.	Portsmouth: Business plan 2020-25, page 31.

Source: Company submissions to Ofwat.

- 8.69 As can be seen from the table above, there is widespread concern about the robustness of this measure given its complexity and how recently it has been introduced.
- 8.70 While some companies may have reached a position where they consider a low % value target to be acceptable within the context of their business plan, it is not a robust approach to set a comparison-based target for this measure.

There is substantial variation in interpretation of the definition

- 8.71 We understand that companies interpret or apply the methodology in different ways, compared with how we have interpreted it in our September and April plans (for example by reporting against levels of demand instead of peak week production capacity). This inconsistency can only lead to a wide range of levels of unplanned outage, including some significant reductions between 2017/18 and 2018/19 and into AMP7. It is not appropriate to set the target for Thames Water at the median level when so much uncertainty persists in the interpretation and application of the methodology.
- 8.72 Notwithstanding the question of consistency in the methodology, this is a significant change in approach to managing outage and it will take time to put in place the extensive monitoring to properly implement this new performance commitment and to comply with the new definition.
- 8.73 We note that Ofwat has set Southern Water and United Utilities a less aggressive target, with a much more favourable glide-path for Southern Water. Ofwat has also set more favourable glide-paths for Northumbrian Water, and to a lesser degree, South East Water and Yorkshire Water.

**Table 30: Ofwat targets for unplanned outages**

Companies' forecasts	Ofwat targets					
	2018-19	2020/21	2021/22	2022/23	2023/24	2024/25
Northumbrian Water's DD	6.54	6.37	5.36	4.36	3.35	2.34
Southern Water's DD	11.30	9.44	9.11	7.33	6.45	3.25
South East Water's DD	4.80	4.15	3.70	3.24	2.79	2.34
United Utilities' DD	11.02	11.02	10.91	10.80	10.69	10.58
Yorkshire Water's DD	8.00	5.12	4.42	3.73	3.03	2.34
Thames Water's DD	18.00	3.51	3.22	2.92	2.63	2.34

Source: Draft determinations, and companies' April data tables (App1).

- 8.74 It would seem to be inconsistent to allow some companies a much more favourable glide-path (and end position) but to require another company to endure a 'cliff edge'.

The metric does not take into account company-specific supply systems and customer preferences

- 8.75 While at first it appears counter-intuitive, there is no evidence that a higher level of unplanned outages, as measured by this metric, would be a detriment to our customers. This is because the metric measures outage of all assets, regardless of whether there are redundancies that allow supply to continue without the asset. Therefore, companies with specific points of redundancy resilience are penalised by the metric.
- 8.76 We have previously invested to install a ring-main around London. This enables us to operate at a comparatively high level of unplanned outage without there being a customer detriment. As such, there has not been the same need to invest in solutions that would reduce unplanned outages, as measured by this metric. By incentivising us to change our operation to meet the DD's target level, Ofwat is effectively penalising Thames Water for its previous investments, which it has not proven were inefficient.

Delivery incentive penalty rate

- 8.77 We are concerned that the proposed penalty rate is disproportionate and does not align to customer preferences.
- 8.78 In our April Submission, we proposed a P10 underperformance scenario of 30%. This is not an unrealistic scenario; indeed it is possible to operate at that level of outage without observing any detriment to customers. If we were to perform at that level over AMP7 (using the ODIs in the DD) we would incur a penalty of £443 million.
- 8.79 Ofwat has used a two-tier approach to set the penalty incentive rates with a penal rate between 2.34% and 3.7% (using 2024/25 figures) so that customers can recover the £77m enhancement expenditure allowance if the outcomes are not achieved. There are three flaws with this approach in this particular situation:
- As highlighted above, there is a high level of uncertainty over the reporting against this measure and therefore the results of expenditure on outcomes is unreliable;
 - We have included a stretch target of 5% in our scenario as part of DD response. The £77m will contribute to, but not guarantee, performance at this level - it will not facilitate the DD levels of performance; and



- It will create perverse incentives in that if there is a risk that the outcomes will not be reached – the incentive will be not to spend the £77m on improving assets as otherwise the company may spend the money and still have to repay it to customers through the ODI.
- 8.80 Given the unreliability of reporting for this measure, we believe that a financial incentive is inappropriate. It is also inappropriate, for the same reasons, to include the £77m allowance in the incentive rate for the most stretching performance. A more reasonable position would be to exclude the enhancement expenditure from the incentive rate and include a separate delivery incentive for the allowance to provide customer protection. If Ofwat still wishes to provide customer protection over the enhancement allowance through the ODI rate, it should be recovered from any failure to deliver the 5% commitment that it will contribute towards to avoid unintended consequences. Any stretch target beyond 5% that Ofwat may impose should not attract a penal rate.

Request of Ofwat

- 8.81 Against the background of significant uncertainty in cost reporting and interpretation of the methodology, we consider that it is not appropriate for this measure to have punitive financial penalties attached to this common performance commitment at this stage of its development.
- 8.82 Therefore, we are proposing a reputational incentive of 5% for 2024/25 with a glide path, as detailed in the table below, with a separate delivery incentive of £77 million if we do not deliver the associated schemes that Ofwat has funded us for (i.e. the upgrade to recirculation and run to waste at Coppermills WTW SSF beds - £37.7 million, the upgrade to recirculation at Ashford Common WTW SSF beds - £35.9 million, and the upgrade to Hampton WTW Eastern slow sand filter beds £3.5 million). We are proposing the delivery incentive on the condition that Ofwat accepts our position that unplanned outages should be a non-financial measure.

Table 31: Our proposed glide path target for unplanned outages

	2020/21	2021/22	2022/23	2023/24	2024/25
Performance commitment (%)	6.00	5.75	5.50	5.25	5.00

Source: Thames Water.

F C-MeX

- 8.83 We have concerns about comparability and the relative scoring, which impacts on the regulatory incentives of C-MeX. Relative scoring significantly increases the level of complexity required in a metric and fails to recognise improvements in performance, or relative differences between companies, or customers' expectations. Small changes in performance can result in large rewards/penalties that are not necessarily supported by customers' willingness to pay. Further, each company faces different challenges relating to the specific needs, challenges, priorities and customers of the region it serves. We propose that for the final determinations, for Ofwat to complete the design of a metric and incentive that is based on the absolute improvement of each company.



Performance measure and delivery incentive

- 8.84 We acknowledge that Ofwat has responded to our concerns about C-MeX in its DD response. We remain in total support for the use of a common customer service performance commitment that incentivises companies to make improvements for their customers. And we are committed to working with Ofwat during this shadow year as the surveys are refined.
- 8.85 Nevertheless, we continue to have concerns about comparability and fairness, as well as the relative scoring, which impacts on the regulatory incentives of C-MeX:
- **Relative scoring fails to recognise improvements in performance, or relative differences between companies, or customers' expectations:** C-MeX penalties and rewards are not sensitive to absolute improvement in service; but rather, to the distribution of companies, relative to each other. We are concerned that significant rewards and penalties apply to companies based on small differences in performance. This means that rewards will always be paid to the best performing companies in this measure (even if no improvement happens) and penalties will always be paid by the worst performing companies (even where there is significant improvement). Specifically, based on the current C-MeX design, we are very concerned that we could still suffer a significant penalty over the AMP period despite a step change in performance due to the impact of the in-year penalty application on companies with an improving performance trajectory. While we are absolutely committed to improving our service to our customers, the relative scoring within C-MeX, as proposed, appears to be unreasonable because it fails to recognise marked improvement appropriately. Also, the relative reward / penalty structure does not take into account what customers are willing to pay for or expect. This creates a system in which incentives are not related to the benefit generated for customers but related to effort needed to stay ahead of the pack. We ask Ofwat to consider a metric based on the absolute improvement of each company; and
 - **Metric results are not comparable:** Each company faces different challenges relating to the specific needs, challenges, priorities and customers of the region it serves; most of which are outside its control. However, the current C-MeX metric does not control for such differences (e.g. through weighting). This means that the metric result is not comparable. Specifically, we have presented results to Ofwat that demonstrate that different socio-demographic groups derive different scores. Each company will have a unique distribution of socio-demographic groups – but will have rewards/penalties determined by relative scores. This means that comparable performance in different parts of the country will result in different scores, purely because of differences in the distribution of socio-demographic groups. While the weighting of samples adds complexity, we believe that given this natural bias, Ofwat needs to consider how weighting the sample could control for this bias (e.g. using a national distribution of socio-demographic groups to determine the sample). Given the relative scoring, where rewards and penalties are paid given the relative position of the metric results, the financial impact of C-MeX does not necessarily reflect the true performance of companies. We ask Ofwat to consider and share comparability evidence collected during the shadow year to derive appropriate weighting.
- 8.86 We appreciate that Ofwat has tried to address some of these issues for instance by mandating the number of contact channels a company must use or face penalty points, weighting online surveys as typically customers give lower scores just because of the survey channel used,



ensuring face-to-face interview volumes are the same for each company. However, the surveys have now become complex due to the different weightings applied and confusion relating to the methodology, especially on NPS, without necessarily addressing all the issues. As a result, it is difficult to provide a simple explanation to customers how the metric works, which is the ultimate test. It also means that C-MeX is difficult to engage with for employees and to drive improvement.

- 8.87 We believe that there is simple and easy answer to the way that Ofwat could address this, one which does not need to find complex solutions to the differences that exist through weighting of surveys or penalising companies for lack of customer channels.

Request of Ofwat

- 8.88 We ask Ofwat to complete the design of a metric and incentive that is based on the absolute improvement of each company. C-MeX as being tested in shadow year could stay as is although we consider that if this approach was taken, it could be significantly simplified by using just one metric of CSAT or NPS and removing most of the weighting. A base line target could be set at the end of shadow year and targets for improvement set for each company. This would help address the issues regarding customer and regional differences. Companies who wanted to pay for top up surveys to make their data more statistically robust could do so without an impact on any other company.
- 8.89 We recognise that our customer service needs to significantly improve, and we remain committed to making that improvement for the benefit of all of our customers. We believe that if Ofwat makes the change described it will prove to be a more meaningful and compelling incentive as all companies would have the opportunity to have improvements in customer service recognised which is important for the reputation of our industry and the critical public service we provide.

G Mains repairs

- 8.90 The DD sets our mains repairs target based on our best performing 3 years over the last 7 years, in which we carried out the lowest number of repairs in recent history.
- 8.91 This target is exceptionally challenging because:
- a) The three years selected were not average years; and
 - b) We have a major leakage reduction programme in AMP7, which will result in more mains repairs.
- 8.92 Following Ofwat's feedback, we have undergone a rigorous process to re-interrogate our delivery plans, demanding more ambition from our business regarding performance commitments. We consider that it may be possible to achieve Ofwat's 2024/25 target of 231 mains repairs per 1,000 km. This represents a step level change relative to today's level.
- 8.93 We will focus on a 'Calm Systems' approach to help deliver our mains repairs as part of our long-term vision. This will take time to implement. Therefore, we are proposing an alternative glide-path over AMP7 to hit the 2024/25 target.



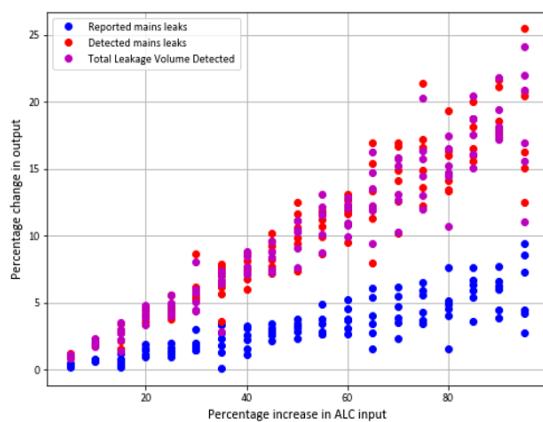
Performance commitment target

- 8.94 Ofwat has calculated an average of our 3 best historical years out of the last 7 and applied this as a flat target across AMP7⁹⁷. As a result, our 3 best performance years of 2011/12, 2012/13 and 2015/16 were averaged to 231.3 bursts per 1,000km of water main.
- 8.95 We disagree with Ofwat's approach as it fails to take into account the:
- Impact of leakage reduction; and
 - Impact of weather.

Impact of leakage reduction

- 8.96 We are concerned that Ofwat does not consider there to be a correlation between active leakage reduction and total mains repairs.
- 8.97 This relationship was established in a report by UKWIR in 2019⁹⁸. This report draws evidence from four companies. The figure below demonstrates an increase in reported bursts (hence mains repairs) as leakage reduction ("ALC") activity increased.

Figure 20: Number of visible mains bursts increases with leakage reduction (ALC)



Source: UKWIR 2019, figure 59.

- 8.98 Further, we are concerned that Ofwat appears to believe that there is an inverse relationship between increased leakage reduction and reactive mains repairs.
- 8.99 As we set out in Section 4 of our April submission, we have not seen a reduction in our visible mains bursts (reactive repairs) because of our leakage reduction activities. This is based on our active monitoring of mains repairs during leakage reduction activity.
- 8.100 Recent research by UKWIR on the impact of reductions in leakage levels on leak repair frequencies has also concluded:

"There is no clear evidence of an offsetting of increased detected leaks by fewer reported leaks as leakage is reduced. As a result the total number of leak repairs would be expected to increase."

⁹⁷ Ofwat, Delivering outcomes for customers policy appendix, page 39-41.

⁹⁸ UKWIR, The impact of reductions in leakage levels on reported and detected leak repair frequencies, 2019.



Impact of weather

- 8.101 Stable and mild weather poses the least threat to pipes: during increased heat in summer, soil dries out and moves, impacting pipes; while cold temperatures cause pipes to contract during winter.
- 8.102 In 2011/12, 2012/13 and 2015/16, we experienced better weather conditions, with milder summers and winters. These years were the best years for mains repairs in the last 7 years. Whereas in 2014/15, 2016/17 and 2017/18, we experienced worse weather conditions with harsher winters. This led to significant numbers of reactive mains repairs.

Request of Ofwat

- 8.103 We have reviewed our most recent performance against our historical trajectory and believe we can improve on our target of 281 bursts per 1,000km water main to meet Ofwat's ambitious target of 231.3 mains repairs per 1,000km of mains by 2024/25. However, we are unlikely to deliver Ofwat's target without favourable weather conditions, but we are willing to take on additional stretch in our ambition.
- 8.104 We have a significant issue if we want to increase our leakage reduction to meet ambitious targets, which will increase mains repairs; as well as reducing mains repairs to meet Ofwat's target. We describe in the box below our new plan for reducing both leakage and mains repairs. However, we will not be able to fully offset our increased leakage reduction in the short term. Therefore, we propose a more graduated performance commitment target trajectory to reach 231.3 bursts per 1,000km water mains in 2024/25, than set out in the DD, as detailed below.

Table 32: Ofwat's DD mains repairs PC target and our proposed target trajectory

	2020/21	2021/22	2022/23	2023/24	2024/25
Ofwat's DD mains repairs – performance commitment	231.3	231.3	231.3	231.3	231.3
Our proposed mains repairs – performance commitment	261.3	253.5	245.9	238.5	231.3

Source: Draft determinations and Thames Water analysis.

Box: Calm Systems approach

Our focus will be on a Calm Systems approach to help deliver our mains repairs and leakage targets as part of our long-term vision. Over-pressurisation of any water main will lead to an increase in leakage. The instant rate of change in pressure, known as surge pressure, is believed to be a root cause of premature pipe degradation – which in turn leads to an increase in leakage and burst mains.

Our specialist System Operations team are reviewing each site in detail using pressure loggers capable of 120 readings per second, to help prioritise poorly performing leakage areas. We anticipate resolutions will involve mechanical and process changes (e.g. optimising pump operation; improving how a pump is introduced into service; utilising new technology to promote smart control and reduce system shock). We are also providing additional training for our field teams. These are all steps that require a significant amount of work to achieve a calm operation, but it is crucial to provide an improved service to our customers.

The immediate benefit of the Calm Systems approach on leakage and bursts is unclear, but we expect to see asset health improve over the longer term. It is an adaptive approach that relies on roll-out of training for all frontline staff alongside trialling and evaluation of resolutions to gradually develop an approach that covers our entire network.



Delivery incentive

- 8.105 Ofwat has increased the underperformance rate to the upper bound of its IAP benchmark range as it considers that we are comparatively a poor performer.
- 8.106 We are concerned about this approach for the following reasons:
- We are not a poor performer when the impact of London is taken into account; and
 - The total penalty potential is disproportionate and could distort against customer priorities.

We are not a poor performer when the impact of London is taken into account

- 8.107 As set out in Section 6 of our April Submission and our London network maintenance Cost Adjustment Case⁹⁹, there are a number of London-specific factors that lead to network deterioration and consequently, higher burst rates. We observe that mains repairs are correlated with:
- Soil corrosiveness;
 - Age of mains (particularly ferrous materials); and
 - Greater loadings due to traffic braking and acceleration (Section 6 Table 8).

- 8.108 Each of these factors are more prevalent in London and built-up areas in our region, compared to the national average. We ask Ofwat to return to our April Submission for the detailed background.
- 8.109 When these additional factors are controlled for, then we are not a poor performer in the industry. Therefore, we request Ofwat to reverse its policy decision to increase the underperformance rate based on comparative poor performance.

The total penalty potential is disproportionate and could distort against customer priorities

- 8.110 Our customer research revealed a preference for an incentive balance between the ODI penalties for asset health PCs (such as mains repairs) and service delivery measures (such as leakage and supply interruptions)¹⁰⁰.
- 8.111 The DD's P10 financial exposure on mains repairs is more than double that of the next largest performance commitment (supply interruptions); and further, it is more than supply interruptions and leakage combined, as shown in the figure below. Retaining such a significant underperformance rate and collar for mains repairs would unduly incentivise our focus away from other measures, such as supply interruptions.

⁹⁹ TW-DD-A03.

¹⁰⁰ TSD019-CR27-PR19-PCs and ODIs, slide 63.

**Figure 21: Key wholesale water performance commitments P10 positions (£m)¹⁰¹**

Source: Thames Water - based on DD outcome performance commitment appendix.

Request of Ofwat

- 8.112 Therefore, we request Ofwat to reduce our underperformance rate and collar on the basis that we are not a comparatively poor performer, when London factors are controlled for; as well as to balance our overall ODI penalty incentive.
- 8.113 We propose that for the final determination, Ofwat should adopt our April Submission underperformance rate, as this was based on our customer valuations. This would mean a reduction from a penalty rate of £0.414 million (per the number of repairs per 1,000 km of mains), to £0.177 million.
- 8.114 In addition, we propose that Ofwat should adopt our reduced collars and consequential reduced caps in the table below to better balance this PC within our ODI package.

Table 33: Our proposed caps and collars for mains repairs

	2020/21	2021/22	2022/23	2023/24	2024/25
Outperformance cap	212.0	205.7	199.5	193.5	187.7
Underperformance collar	339.0	328.0	318.0	309.0	300.0

Source: Thames Water

H CRI

- 8.115 In our business plan, we separated the water quality compliance (CRI) PC into two components; one for metaldehyde alone and another based on all determinants excluding metaldehyde. The reason we made this split was that metaldehyde failures (as defined within the CRI) are extremely volatile, distorting the overall metric.
- 8.116 For example, a single metaldehyde exceedance at one of our large London treatment works can generate a CRI score of 1.5. Individual results such as this can make CRI very volatile, especially when compared against the CRI score excluding metaldehyde failures. In recent years, we have had multiple occasions where our overall CRI score has exceeded 40, with 39 points of the overall score coming from metaldehyde failures, none of which resulted in harm to our customers. Metaldehyde failures rarely result in any kind of customer detriment. The levels of metaldehyde

¹⁰¹ This is based on the p10/p90 positions from our April plan, and the performance commitment and ODI rates from the DDs.



we detect do not present a risk to public health, nor do they impart any aesthetic issues to the drinking water. Metaldehyde is a regulatory compliance issue and not a public health issue.

- 8.117 In December 2018, Defra announced the withdrawal of the outdoor use of metaldehyde which was due to come into force in June 2020. Ofwat's DD disregarded our proposal for a bespoke CRI performance commitment, because it considered the ban on metaldehyde "removes the need for multiple performance commitments in the form the company proposes."¹⁰² Instead, Ofwat set a single CRI measure with a deadband at 2 for 2021 and 2022 and then 1.5 for the rest of AMP7.
- 8.118 However, since the DDs, (in July 2019), this decision was overturned by the high court following a judicial review. Metaldehyde can continue to be sold on the market for outdoor applications. The assumptions made by Ofwat in the IAP and DD regarding the withdrawal must now be reassessed. We understand Defra intends to appeal the decision, but nothing has been confirmed, and no timetable has been set for any potential appeal or renewed decision by Defra to restrict the sale of metaldehyde products.
- 8.119 In the longer term, our catchment management approach to reducing the concentration of metaldehyde in environmental waters will provide a mechanism for securing compliance with the drinking water quality standard. By working with farmers to reduce run-off into surface waters and using abstraction management techniques, our approach seeks to avoid the need for significant investment in metaldehyde treatment in the future. We are also working with regulators to identify appropriate solutions if a product restriction is required, in the event that catchment management and abstraction management is not successful.
- 8.120 For now, we must assume that metaldehyde products will be available for use during AMP7. This increases the potential for CRI failures for those companies particularly affected, including Thames Water. Therefore, there is a strong case for any performance commitment and ODI to recognise the ongoing use of metaldehyde and the likelihood of CRI failures as catchment management measures are implemented and upscaled over the AMP. This requires appropriate regulatory treatment, including an appropriate level of deadband and collar on penalties.

Request of Ofwat

- 8.121 We are therefore proposing the following options to address the metaldehyde issue within the outcomes package:
 - a) Our April business plan proposal – i.e. one measure for metaldehyde (with a collar) and one for all other determinants excluding metaldehyde. A collar will be needed to ensure that if repeat metaldehyde failures are encountered during extreme weather conditions, the penalty is not unduly excessive. Incurring an excessive PC penalty due to metaldehyde failures would not benefit customers especially as we have agreed catchment action plans in place with both the DWI and EA;
 - b) Ofwat's DD proposal for a single CRI measure but exclude metaldehyde from the CRI definition. For consistency this should be applied to all companies; or

¹⁰²

"Thames Water – Delivering outcomes for customers actions and interventions", p13, action reference TMS.OC.A19, Ofwat, July 2019.



- c) Ofwat's DD proposal for a single CRI measure but exclude metaldehyde failures for assessing penalties. For consistency this should be applied to all companies.
- 8.122 Our preference is option c). This retains Ofwat's preferred structure of a single measure, common to all companies in the sector. It also ensures that with the ongoing availability and use of metaldehyde, failures can be monitored and reported, while offering a degree of protection against excessive financial penalties that could be incurred. For these reasons option 3 is in customers' best long-term interests.

I Other PCs

- 8.123 The above measures are the more material areas of disagreement we have with Ofwat's DD proposals for outcomes. We provide details on the other measures in the outcomes appendix¹⁰³.

J Consequences of the business plan scenario - Rationalisation of bespoke PCs

- 8.124 The DD's position on stretching our performance for a number of Common PCs with lower funding has challenged us to place renewed focus on our totex forecasts in this scenario.
- 8.125 Our *lower cost, lower investment* scenario requires us to remove some of our bespoke PCs, because we are unlikely to be able to deliver as many of the 'slow burn' sustainable and environmental improvements that we envisaged in our April business plan, as well as less resilience in the round. The reduction in totex results in the following bespoke PCs being removed:
- **Sewage pumping station availability:** For our *lower cost, lower investment* scenario, we have reduced investment in low probability / high consequence failure of strategic storm pumping stations. Performance improvement is no longer possible and remaining investment does not warrant a PC;
 - **Surface Water Management:** As our *lower cost, lower investment* scenario requires a greater short-term performance improvement at lower cost to achieve our flooding commitment, we can no longer commit to this measure. We would still endeavour to deliver some sustainable drainage solutions where appropriate;
 - **Water Quality Events:** The reduction in resilience base spend at water treatment works under this scenario results in the removal of this Performance Commitment; and
 - **Responding to Trunk Mains Bursts:** Our *lower cost, lower investment* scenario requires the removal of trunk mains resilience investment; hence we could no longer commit to this measure.

¹⁰³

TW-DD-A12-Outcomes.



8.126 In addition, we consider that the bespoke PCs listed below duplicate other measures and should be removed. This to allow greater management focus on delivering common PC stretching targets:

- **Percentage of satisfied vulnerable customers:** We consider that this reputational bespoke PC included in the DD duplicates the Priority services for customers in vulnerable circumstances common PC;
- **Installing new smart meters in London:** We are already committing to very stretching targets for leakage and per capita consumption and consider that this bespoke PC proposed by Ofwat in the DD is a duplication of our commitment.
- **Replacing existing meters with smart meters in London:** For the same reasons as installing new smart meters above, we consider that this new bespoke PC proposed by Ofwat in the DD is a duplication and should be removed; and
- **Legacy SEMD:** This should be removed because we consider that Ofwat has misunderstood the AMP6 performance commitment.



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Chapter 9

Achievability of the business plan scenario

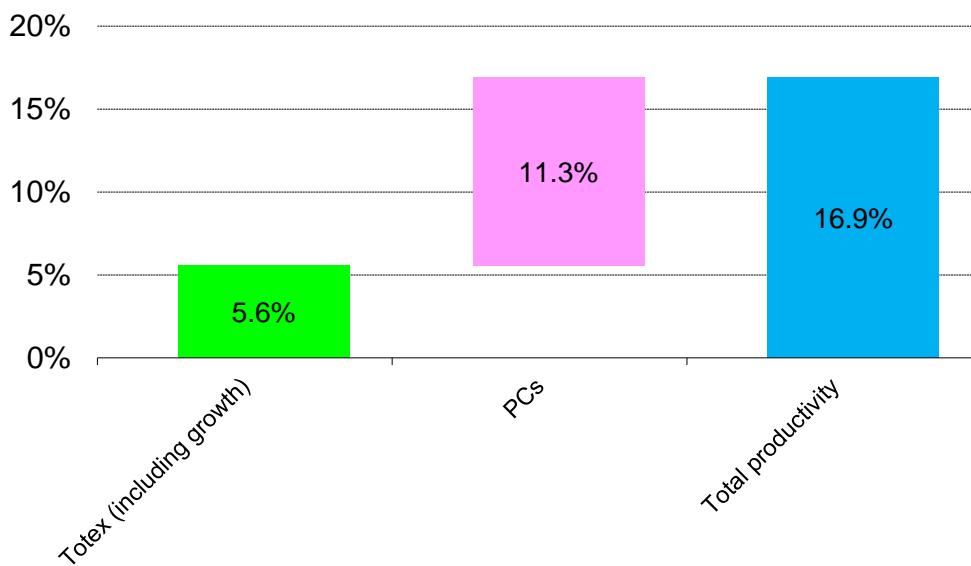
A Introduction

- 9.1 In this Chapter, we describe the financial achievability of the business plan scenario. We discuss:
- **Section B:** Productivity shift implied by the business plan scenario;
 - **Section C:** Financeability of the business plan scenario; and
 - **Section D:** RORE analysis of the business plan scenario.

B Productivity shift implied by the business plan scenario

- 9.2 The figure below shows the total 5 year shift in productivity, denominated in totex, calculated from our current position in 2019/20 compared to the position by the end of AMP7 in 2024/25.

Figure 22: Total implied productivity shift from 2019/20 to the end of AMP7



Source: Thames Water calculation

Conclusion

- 9.3 In comparison to the 30.0% productivity shift implied by the DD, that we have demonstrated is not deliverable, we believe that the 16.9% productivity shift implied by the business plan scenario



across the 5 years of AMP7, from our current position, is challenging, yet achievable. This productivity shift requires a consistent annual 4% improvement rate for each year, compounded.

C Financeability of the business plan scenario

- 9.4 We have assessed the financeability of the business plan scenario, with details included in the appendices¹⁰⁴. We assess the financeability both an actual and notional basis and the financial resilience to a range of plausible but severe downside scenarios, as informed by the outcome of Ofwat's DD. We conclude that the business plan scenario is financeable.

D RORE analysis of the business plan scenario

- 9.5 In this section we assess the risk profile of the business plan scenario, using RORE analysis, on the following basis:

- **Totex:** actual and allowed expenditure of c. £10bn in line with the P50-based assumption within our business plan scenario; and
- **ODIs:** estimated P10 and P90 ranges assessed by reference to the revised PCs and ODIs which we have proposed as P50 within our business plan scenario.

- 9.6 In undertaking our RoRE assessment, we have adopted the same methodology as set out in our April Plan.

RoRE range results

- 9.7 The table below breaks out the RoRE impact of our upside and downside scenarios (per Data Table App26) for the appointed business in aggregate.

Table 34: Risk scenario impacts on RORE

% impact on regulated equity	P90 (downside)	P10 (upside)
Revenue	0.00%	0.00%
Totex	-1.97%	0.64%
Residential retail costs	-0.24%	0.07%
ODIs	-1.57%	0.85%
D-MeX	-0.07%	-0.02%
C-MeX	-0.35%	0.00%
Financing	-0.21%	0.21%
Total	-4.41%	1.74%

Source: Ofwat financial model (populated with TW data). Numbers may not add due to rounding.

- 9.8 The results show a further increase in risk and a skew to the downside (of -2.67%) compared to our April plan (which showed P90 downside risk of -3.83%, net downside skew of -2.09%). The operational risk implied by our business plan scenario is significant. Focusing on short term outcomes increases the risk of major outages for both water and wastewater services to customers, as we are unable to fully address low probability high consequence risks. There is also an increased environmental risk, as our *lower cost, lower investment* scenario places less emphasis on 'slow-burn', sustainable long-term solutions. This additional risk feeds through into

¹⁰⁴

See TW-DD-A16 - Business plan scenario financeability assessment.



an increased totex risk as evidenced by the RoRE, which now presents downside totex risk of around 2%, compared to around 1.5% in our April plan.

- 9.9 The downside totex skew is primarily event-driven, circumstances which can generate overspends for which there is either no corresponding opposite impact or much lower underspends in relative terms, e.g. it is difficult to envisage upside events which would result in totex underspends which would be greater than or equal to the adverse totex impact of a cryptosporidium event. This second factor, also present in our April plan, explains the downside skew questioned by Ofwat in its DD action TMS.RR.C3.
- 9.10 We consider the implications for financeability of our business plan scenario in Appendix 16¹⁰⁵.

¹⁰⁵ TW-DD-A16 – Business plan scenario financeability assessment.



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Chapter 10

Board sign-off: Confidence in our Plan

A Confidence and assurance

- 10.1 We have carefully considered and responded to the draft determination from Ofwat. Through the PR19 process, we have been fully committed to delivering a customer led, high quality and deliverable Business Plan for 2020-2025. We have satisfied ourselves that our original plans, this August Response to the draft determination and our proposed business plan scenario demonstrate that we are maintaining our customers' expectations of a responsible water and wastewater company.
- 10.2 In the draft determination, we were asked specifically to give assurance over financeability and long-term financial resilience in the context of the draft determination and a reasonably foreseeable range of plausible outcomes of the final determination.
- 10.3 Our Board is providing assurance over the financeability and long-term financial resilience of our business plan scenario as set out in Chapters 7 to 9. We are unable to provide assurance over the financeability and long-term financial resilience of our company for the draft determination as set out in Chapter 4 – ‘The DD is not financeable’.
- 10.4 Overall, we fully support the August Response to the draft determination and business plan scenario as set out within this document.

B Board endorsement

- 10.5 We approved the August Response to the draft determination and business plan scenario at our Board of Directors meeting on 28 August 2019.

Ian Marchant
Interim Executive Chairman

Nick Land
Senior Independent Non-Executive

Brandon Rennet
Chief Financial Officer

Alistair Buchanan
Independent Non-Executive

Paul Donovan
Non-Executive

Catherine Lynn
Independent Non-Executive

Michael McNicholas
Non-Executive

John Morea
Non-Executive

Ian Pearson
Independent Non-Executive

Greg Pestrak
Non-Executive

Jill Shedden
Independent Non-Executive

David Waboso
Independent Non-Executive

