

Balancing Risk & Reward at PR19

**A report for
United Utilities Water Limited**

August 2017

Important Notice

This Report (Report) was prepared by Ernst & Young LLP for United Utilities Water Limited (UU) using information provided by UU, financial data from Bloomberg and publically available information.

Ernst & Young LLP does not accept or assume any responsibility in respect of the Report to any readers of the Report (Third Parties), other than UU.

To the fullest extent permitted by law, Ernst & Young LLP will accept no liability in respect of the Report to any Third Parties. Should any Third Parties choose to rely on the Report, then they do so at their own risk.

Ernst & Young LLP has not been instructed by its client, UU, to respond to queries or requests for information from any Third Party and Ernst & Young LLP shall not respond to such queries or requests for information.

Further Ernst & Young LLP is not instructed by UU to update the Report for subsequent events or additional work (if any) performed by Ernst & Young LLP. Accordingly, without prejudice to the generality of the foregoing, Ernst & Young LLP accepts no responsibility to any Third Party to update the Report for such matters.

Ernst & Young LLP reserves all rights in the Report.



Contents

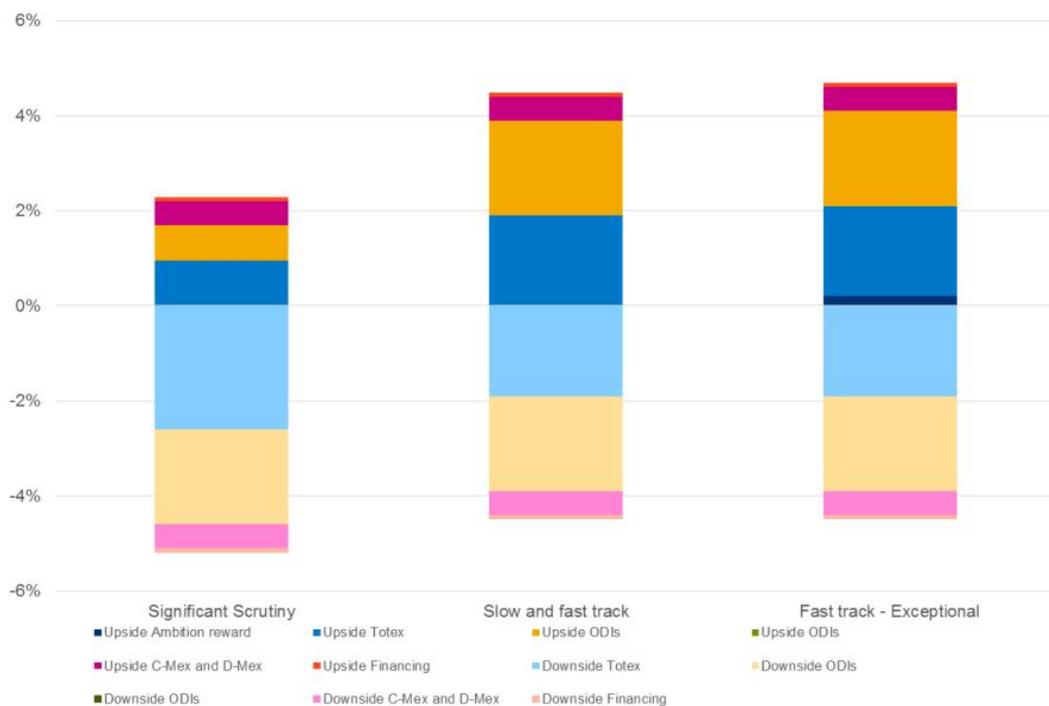
1. Executive Summary	1
2. Introduction	3
3. How is the notionally efficient company defined?	5
3.1 Cost efficiency	5
3.2 Quality of service.....	6
3.3 CMeX and DMeX	6
3.4 Financial performance.....	7
3.5 Summary	7
4. Does a notionally efficient company face a RoRE range similar to Ofwat's guidance?	8
4.1 Totex reward and penalties.....	8
4.2 Service standards.....	11
4.3 CMeX / DMeX.....	12
4.4 RoRE as a Package.....	13
4.5 Summary	15
5. Does the shape of the RoRE range faced by a notionally efficient company have any implications for how the risk and reward balance should be calibrated for that notionally efficient company?	16

1. Executive Summary

Striking an appropriate balance between the risks that investors bear and the rewards available to them is important to balancing Ofwat's various duties. It is right that Ofwat should consider the balance of risks and rewards faced by investors carefully and helpful that they have begun to do so at this early stage in their PR19 methodology consultation paper.¹

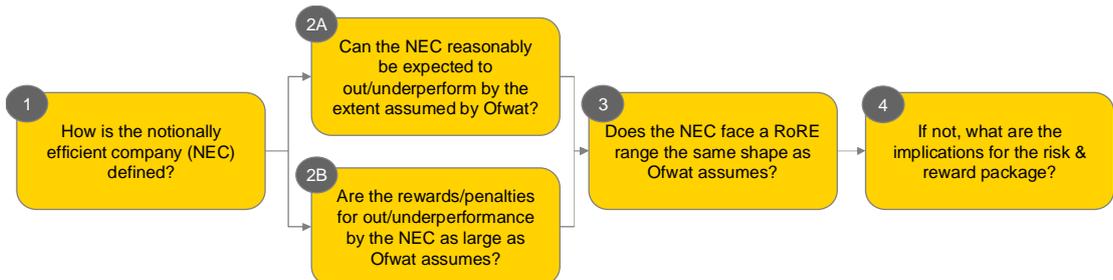
Ofwat proposes to test its package of risk and reward using Return on Regulatory Equity (RoRE) analysis, building on its approach at PR14. In its PR19 methodology consultation, Ofwat has illustrated three RoRE ranges which it proposes companies would be able to achieve depending on which business plan "category" (i.e. exceptional, fast track, slow track or significant scrutiny) the company is in, as shown in Figure 1 below.

Figure 1: Ofwat's illustrative RoRE ranges for different business plan categories at PR19



In order for Ofwat's various duties to be appropriately balanced, it is important that these RoRE ranges are deliverable. To that end, we have considered whether a notionally efficient company (NEC) could reasonably be expected to be capable of achieving the assumed out/underperformance of Ofwat's cost efficiency and service standards targets required to achieve the proposed scale of RoRE rewards and penalties. To explore these issues, we have considered several factors summarised in Figure 2 below.

Figure 2: Our approach to evaluating the deliverability of Ofwat's proposed RoRE ranges



¹ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#).

Our analysis of the levels of performance that a NEC would be assumed to achieve, the potential for outperformance and the rewards for outperformance are summarised in Table 1 for each of the core components of RoRE upside. Table 1 also considers the overall deliverability of the package of rewards i.e. whether a NEC could reasonably be assumed to be capable of outperforming across all these areas simultaneously.

Table 1: Summary of our assessment of the deliverability of Ofwat’s proposed RoRE ranges

	Performance of NEC consistent with Ofwat proposals²	Ofwat assumed contribution to RoRE	Our assessment
Totex	Upper quartile	10% out/under-performance equates to +/- 2% of RoRE	Unclear if 10% outperformance could be achieved by NEC given Ofwat has indicated it intends for totex allowances to be very challenging to meet. 10% outperformance only translates to 1.7% of RoRE based on Ofwat’s “cost sharing spreadsheet model”.
ODIs / PCs	Upper quartile on common PCs and “stretching” on others	+/- 2% of RoRE	Given that the NEC will face upper quartile or stretching PCs, have to retain most of any PR14 PCs it is currently underperforming and that water companies only met around 70% of PCs in 2016/17, it seems unlikely that the NEC would be able to significantly outperform its PCs over the 2020-25 period. Evidence from PR14 suggests customers may not be willing to pay rewards of this magnitude for incremental service improvements.
CMeX / DMeX	Middle-ranking performer	+/- 0.5% of RoRE	NEC would need to be upper quartile within the water sector and the cross-economy UK Customer Satisfaction Index to achieve top end of Ofwat’s rewards. This appears unlikely given no water company has yet achieved upper quartile performance on the UKCSI. Available upside only appears to be worth 0.35% of RoRE.
Total	--	+/- 4.5% of RoRE	It is not clear that the NEC could reasonably be assumed to be capable of achieving some of the upside Ofwat assumes may be achievable on individual RoRE components appears. Historical performance data for UK water companies and energy networks suggests companies are not typically leading performers across all the areas which would be required to achieve the full RoRE upside assumed by Ofwat. Moreover, some of the rewards Ofwat assumes would be available for outperformance may be smaller than assumed.

Overall, our analysis indicates that the RoRE ranges which a NEC would face are likely to be skewed to the downside, rather than the symmetrical shape Ofwat assumes.

Ofwat should revisit the way it has calibrated cost efficiency targets, cost sharing incentives, PCs, ODIs and CMeX and DMeX to ensure the amount of RoRE upside Ofwat assumes is actually available to a NEC. If the RoRE ranges were to remain skewed to the downside for a NEC, the allowed cost of equity would need to be increased so that an investor in the NEC would expect to achieve its required rate of return on equity.

² The NEC is also assumed to have financial performance in line with Ofwat’s assumptions i.e. a cost of existing debt equal to Ofwat’s allowed cost of existing debt, a cost of new debt equal to Ofwat’s cost of debt index in each year and a capital structure in line with Ofwat’s assumptions. For the purposes of this report, noting that Ofwat’s illustrative RoRE ranges include only very small contributions from financial out/underperformance, we assume that the NEC will not out/underperform these financial assumptions.

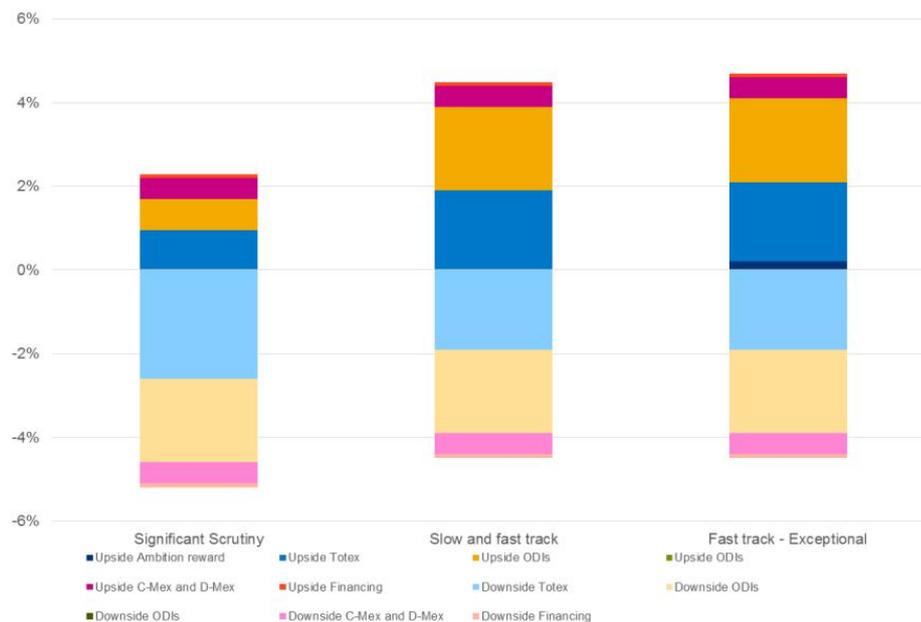
2. Introduction

Striking an appropriate balance between the risks that investors bear and the rewards available to them is important to balancing Ofwat's various duties. It is right that Ofwat should consider the balance of risks and rewards faced by investors carefully and helpful that they have begun to do so at this early stage in their PR19 methodology consultation paper.³

Ofwat's proposed approach to balancing risk and reward at PR19 comprises a number of different strands and tests. The cost(s) of capital⁴ applied to the RCV of each wholesale price control and the retail margin allowed for the residential retail price control are key determinants of the rewards (returns) available to investors and should be consistent with the risks that those investors bear. Ofwat also proposes to apply a package of incentive mechanisms to companies, rewarding (penalising) companies for exceeding (falling short) of specified levels of service and cost allowances. Investors would also bear risks relating to whether the actual cost of debt is higher or lower than the allowed cost of debt, tax costs are higher or lower than tax allowances and whether volumes of bio-resources and water resources are higher or lower than forecast. The application of these incentive mechanisms and presence of other risk factors means that companies could potentially achieve a higher rate of return than the allowed cost of capital i.e. the returns to equity investors could exceed the allowed cost of equity. To test this package of risk and reward, Ofwat proposes to use Return on Regulatory Equity (RoRE)⁵ analysis, building on its approach at PR14.

In its PR19 methodology consultation, Ofwat has illustrated three RoRE ranges which it proposes companies would be able to achieve depending on which business plan "category" the company is in, as shown in Figure 3 below.⁶

Figure 3: Ofwat's illustrative RoRE ranges for different business plan categories at PR19⁷



³ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#).

⁴ The cost of capital applied to each of the water resources, water network plus, sewerage network plus and bio-resources price controls may not be the same.

⁵ Ofwat define RoRE as the return to equity investors in a company with a notionally efficient capital structure: see, Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p192, footnote 62.

⁶ Ofwat has proposed companies would be allocated to one of four categories based on an assessment of their business plans. The four categories, from those Ofwat assesses as the best to those Ofwat assesses as the worst, are "exceptional", "fast track", "slow track" and "significant scrutiny". Further details of Ofwat's proposed approach to assessing business plans can be found at Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p258ff and also Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology: Appendix 14: Initial assessment of business plans](#).

⁷ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), Figure 10.1.



Whether these proposed RoRE ranges strike an appropriate balance between investors and other stakeholders is obviously an important issue. Whether these RoRE ranges are deliverable in practice (i.e. whether the upside and downside around the allowed cost of equity is actually achievable in practice given the assumed levels of costs and performance standards and the design of the various incentive mechanisms) and consistent with the allowed cost of equity is equally important. If the RoRE ranges cannot be achieved in practice, investors may bear more or less risk than is consistent with the allowed cost of equity. This misalignment of risk and reward would not be in customers' long term interests if it led to an increase in investors' required rates of return over time.

In this context, United Utilities Water Limited has commissioned EY to:

- ▶ review and comment on the deliverability of Ofwat's proposed RoRE ranges at PR19; and
- ▶ consider any implications for the allowed cost of equity at PR19 if the RoRE ranges are not deliverable in practice.

Our approach

Ofwat proposes to calibrate the risk and reward package for a NEC. For example, Ofwat state that they “will promote long-term resilience by ensuring notionally efficient companies can continue to finance their functions and invest in the services they provide by earning an appropriate return which reflects the risks they face”.⁸

Ofwat has previously stated that it interprets its financeability duty⁹ to refer to a NEC and this report therefore focuses on whether the proposed RoRE ranges are deliverable for a NEC. Where relevant we also consider whether actual water companies could achieve the proposed RoRE ranges, noting that the CMA has previously had regard to companies' actual performance and capital structures¹⁰ and that Ofwat has requested companies submit information relating to the actual (as well as the notionally efficient) company alongside their PR19 business plans.¹¹

To explore these issues, this report considers a number of questions:

- ▶ Section 3 explores how the NEC should be defined;
- ▶ Section 4 discusses whether a NEC faces a RoRE range similar to Ofwat's guidance; and
- ▶ Section 5 considers whether the shape of the RoRE range faced by a NEC has any implications for how the risk and reward balance should be calibrated for that NEC.

⁸ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p191.

⁹ See, for example, Ofwat (2014) [Setting price controls for 2015-20: Final price control determination notice: policy chapter A8 – financeability and affordability](#), December, p7.

¹⁰ See, for example, Competition and Markets Authority (2017) [Firmus Energy \(Distribution\) Limited v Northern Ireland Authority for Utility Regulation: Final determination](#), June, paragraph 7.102.

¹¹ See Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology: Guidance on business plan data tables](#) for further details.



3. How is the notionally efficient company defined?

A NEC should expect to achieve a rate of return on its regulatory capital value (RCV) equal to its cost of capital and expect to earn a return on equity equal to its required rate of return on equity. We assume that Ofwat would want this NEC to face a RoRE range in line with Ofwat's guidance.¹² However, Ofwat does not provide a comprehensive definition of a NEC in its PR19 methodology consultation. Further, Ofwat has also not been clear about which of the business plan categories the NEC would be allocated to.

The definition of a NEC and the business plan category that it would belong to need to be addressed in order for Ofwat's proposed RoRE ranges to be properly assessed. We return to the latter issue later, but first we consider the definition of a NEC.

Defining a NEC requires defining how efficient the NEC is assumed to be along a number of relevant dimensions impacting on the RoRE range i.e. the factors which impact on the expected rate of return, the contributions of different types of out/underperformance to the RoRE range and the definition of regulatory equity used in the denominator of the RoRE calculation. Accordingly, the NEC needs to be defined along at least three dimensions:

- ▶ cost efficiency i.e. how cost efficient the company is, measured across the wholesale and retail price controls;
- ▶ standards of service i.e. what level of service the company is expected to deliver, measured across all relevant PCs (whether there are financial or non-financial ODIs attached), including the new CMEx and DMEx mechanisms relating to customer and developer experience of water company services;
- ▶ financial i.e. the capital structure, cost of capital, residential retail margin and tax costs assumed to apply to the NEC.

We discuss each of these dimensions in more detail below.

3.1 Cost efficiency

A key aspect of the NEC will be its assumed level of cost efficiency, spanning each of the price controls (both wholesale and retail). We assume that a NEC would be as efficient as Ofwat's definition of efficiency used in its cost benchmarking e.g. if Ofwat set an efficiency benchmark at the "upper quartile" level of historical costs as it did for wholesale totex at PR14, then the NEC would be as efficient as this upper quartile benchmark.

For PR19 Ofwat has not yet clearly indicated whether it will adopt an upper quartile or some other approach. Ofwat has, however, stated that:¹³

- ▶ it expects companies to catch-up to frontier level performance rather than upper quartile and it may adopt a "more stringent" efficiency challenge than at PR14;
- ▶ it will consider the use of companies' forecast cost data as well as historical information to inform its benchmarking analysis – on the assumption that forecast costs will be more efficient than historical costs data, this could imply a more challenging set of cost benchmarks than in the past; and
- ▶ it will look to benchmark cost efficiency against out-of-sector evidence (i.e. not just water companies), particularly for residential retail price controls.¹⁴

Ofwat has indicated it will consider a variety of econometric models to assess the efficiency of water companies and each of the individual price controls.¹⁵ It is conceivable that these

¹² That is, Ofwat would not want the NEC to face a RoRE range that has more or less upside (downside) than Ofwat has assumed nor would Ofwat want the NEC to face an asymmetric RoRE range (noting Ofwat has proposed symmetric RoRE ranges for "exceptional", "fast track" and "slow track" companies).

¹³ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p165.

¹⁴ We assume that Ofwat anticipates that out-of-sector comparators will appear to be more efficient than water companies and lead to stronger efficiency challenges being applied to water companies.

¹⁵ We assume for the purposes of this report that Ofwat's models will not systematically over- or under-estimate efficient costs. Ofwat has also indicated that it will consider company-specific adjustments to the totex allowances, so we assume that the totex allowances will take into account differences between companies (e.g. regional factors).



different approaches for different price controls could lead to the efficient benchmark being defined as the sum of efficient costs defined for each price control, rather than as efficient costs measured across a vertically integrated water company.

Ofwat has also introduced other changes to its regulatory framework – such as its categorisation of business plans and to cost sharing incentives – which are intended to encourage companies to compete with each other to submit the most efficient business plans possible. These changes could, through the use of forecast data in the benchmarking analysis, lead to more significant cost efficiency challenges at PR19 than in the past.

At this stage, noting that Ofwat’s proposals are subject to consultation, it is not yet clear how efficient the NEC will be assumed to be, but it appears set to be at least equal to upper quartile performance measured across the industry in 2018/19 (the last year of data which will be available when Ofwat sets PR19 Final Determinations) and could be more efficient than this if weight is placed on out-of-sector comparators and on forecast cost data from companies’ business plans.

3.2 Quality of service

Ofwat proposes to incentivise companies to deliver appropriate standards of service through a combination of Performance Commitments (PCs) and Outcome Delivery Incentives (ODIs). PCs will define a particular area of service (e.g. leakage or sewer flooding) as well as a committed or target level of service which the company needs to achieve. ODIs will specify the rewards and penalties which could apply if the company achieves higher or lower standards of service than its target.

Ofwat proposes that companies will have PCs in 14 common areas, such as asset health and resilience.¹⁶ The CMeX and DMeX mechanisms discussed below are two of these 14 common PCs. For the remaining twelve common PCs, Ofwat proposes that the target level of service be set as follows:

- for four of the twelve¹⁷, Ofwat considers companies should be able to achieve the same level of performance, so Ofwat proposes that all companies “should propose their commitment levels to be at least the forecast upper quartile in 2024-25”;¹⁸
- for leakage, companies should set target levels of service equal to forecast upper quartile performance and achieve at least a 15% reduction over AMP7, or justify why these targets would be inappropriate;¹⁹ and
- for the remaining PCs, committed service levels should be “stretching” taking into account customer engagement and a range of information including cost-benefit analysis, comparative information and the scope for improvements over the 2020-25 period.²⁰

Companies may also propose additional bespoke PCs, reflecting the company’s customers’ particular preferences.²¹ The targeted service levels for these PCs would also need to be “stretching” and be calibrated in line with the third category of common PCs above.

The NEC would need to meet all of its committed service levels in order to avoid incurring any penalties or achieving any rewards. While the exact standards of service are not yet clear, the NEC would need to achieve upper quartile performance in a number of areas and “stretching” PCs in others.

3.3 CMeX and DMeX

CMeX and DMeX are new customer experience incentive mechanisms which Ofwat proposes to introduce for PR19 to replace the Service Incentive Mechanism (SIM). The

¹⁶ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p56.

¹⁷ Water quality compliance, water supply interruptions, internal sewer flooding and pollution incidents: see Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p67.

¹⁸ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p67.

¹⁹ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p70.

²⁰ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), pp65-66.

²¹ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p62.



objective of these new mechanisms is to encourage further improvements in performance by water companies over AMP7.

On the assumption that the NEC expects to earn a rate of return on equity equal to its required rate of return and that the allowed cost of equity equals the required rate of return, then the NEC would be expected to meet its CMeX and DMeX targets, but not – in a central case – to out- or under-perform those targets. Ofwat's proposals appear to be to rank the companies on the basis of their CMeX and DMeX performance, with the best performers receiving rewards and the worst performers penalties.²² This suggests that the NEC would be a middle-ranking company on CMeX and DMeX.

3.4 Financial performance

The NEC would be expected to perform in line with Ofwat's financial assumptions i.e. in relation to cost of debt²³ and tax allowances.²⁴ The NEC would also have a capital structure in line with Ofwat's assumptions,²⁵ thereby aligning the amount of equity on the balance sheet with the amount of "regulatory equity" Ofwat uses in its calculation of RoRE. Because the NEC would not have any financing out/underperformance, we do not discuss financing out/underperformance in any detail over the remainder of this report.

3.5 Summary

Overall, based on the discussion above, the NEC appears to have the following characteristics:

- ▶ the NEC achieves upper quartile efficiency on totex in each of the water resources, water network plus, sewerage network plus, bio-resources and residential retail price controls;²⁶
- ▶ the NEC achieves upper quartile standards of service on the four common PCs with common committed service levels and "stretching" standards of service on the remaining common PCs and any additional company-specific bespoke PCs;
- ▶ the NEC would be a middle-ranking performer on the CMeX and DMeX incentives (incurring no penalties and earning no rewards); and
- ▶ the NEC has a capital structure in line with Ofwat's assumed notional capital structure, an actual cost of existing debt equal to Ofwat's assumed existing cost of debt, an actual cost of new debt equal to Ofwat's cost of debt index in each year of the 2020-25 period and tax costs equal to Ofwat's tax allowance.

One consequence of this definition of a NEC is that the NEC will be different for each actual water company. Because the targeted levels of service that the NEC has to achieve are informed by company-specific customer engagement, those levels of service will vary from actual company to actual company. Unless the cost allowances are adjusted for differences in targeted service standards – and to our knowledge this is not currently expected to be the case – the NEC will be expected to deliver different standards of service with the same level of funding. The NEC will therefore have to achieve more stretching service standards for some actual water companies than others.

²² See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p97 and p104.

²³ This means that the NEC would have a cost of existing debt in line with Ofwat's allowed cost of existing debt and its new debt costs would match Ofwat's cost of debt index in each year of AMP7. Ofwat has indicated it will set the cost of debt at PR19 by reference to industry benchmarks. See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), pp208-210 for more details.

²⁴ Ofwat has proposed to adopt a similar approach to determining tax allowances as at PR14, but with additional in-period adjustments to allowances to reflect changes in certain tax rates. This approach means that the NEC would have expected tax costs reflecting Ofwat's assumptions about profitability (corporate taxes), the capex programme (impacting on capital allowances) and interest costs (tax deductible). See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), pp212-213 for more details.

²⁵ Ofwat assumed a notionally efficient capital structure at PR14 of 62.5% gearing, and Ofwat has indicated it will assume gearing that is no higher than this level at PR19. See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p219 for more details.

²⁶ As discussed above, this is likely to mean being more efficient than achieving upper quartile efficiency across wholesale water, wholesale sewerage and residential retail price controls or at Appointee level.



4. Does a notionally efficient company face a RoRE range similar to Ofwat's guidance?

In the previous section we defined the NEC along a number of dimensions, including cost efficiency, service quality and financial structure. Having defined this NEC, the question is then whether the RoRE range it faces is the same as Ofwat's proposals (outlined in Figure 3 earlier).

The answer to this question depends, in part, on which business plan category a NEC would belong to. In this regard, while Ofwat has not been clear at this stage about which category a NEC would be in, we assume that it should be able to achieve the RoRE range consistent with a company in the "fast-track" category. This is because we assume the NEC will be as efficient as Ofwat's efficiency benchmark, which as discussed earlier, Ofwat has proposed will be at least as efficient as upper quartile performance. We assume that an "exceptional" company would need to be at the frontier of industry efficiency and may therefore be considered to be more efficient²⁷ than a NEC whilst companies in the "significant scrutiny" and "slow-track" categories would presumably be assessed as less efficient than the NEC by Ofwat.

The question is then whether a NEC in the "fast track" category would expect to face a RoRE range in line with Ofwat's guidance. If the NEC is to face Ofwat's proposed RoRE range, then that NEC must reasonably be expected to be able to:

- ▶ earn/incur up to 2% of RoRE through totex out/underperformance rewards i.e. by out/underperforming on totex;
- ▶ earn/incur up to 2% of RoRE through ODI rewards/penalties i.e. by out/underperforming on PCs; and
- ▶ earn/incur up to 0.5% of RoRE through CMeX and DMeX rewards/penalties i.e. by out/underperforming on CMeX and DMeX.

We consider each of these areas one by one below, before then considering whether the NEC could reasonably be expected to achieve outperformance across all of these areas at the same time (necessary to achieve the top end of Ofwat's RoRE range).

4.1 Totex reward and penalties

Ofwat state that companies able to outperform (underperform) the allowance by 10% would have a RoRE range around +2% (-2%). This raises two questions:

- 1) Can the NEC be reasonably expected to out/underperform the cost allowances by 10%?
- 2) If the NEC did out/underperform by this magnitude, would that give rise to a +/- 2% contribution to RoRE?

4.1.1 Can the NEC be reasonably expected to out/underperform its cost allowances by 10%?

On one level, Ofwat could simply define the NEC to be capable of achieving out/underperformance of cost allowances by 10%. However, Ofwat's definition of the NEC and what it can achieve needs to be consistent with Ofwat's duties. In practice, Ofwat cannot simply define the NEC to be capable of outperformance. Some basis for the achievability of this assumption needs to be advanced.

²⁷ Ofwat state that in an ambitious and innovative business plan "the company will present strong evidence of sector leading cost efficiency" (see Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology; Appendix 14: Initial assessment of business plans](#), p16) and that "to be classed as exceptional, in addition to being ambitious, a business plan must therefore show how innovative approaches will be used to make costs more efficient and/or to give an exceptional level of service" (see Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p266).



One source of evidence is the level of out/underperformance achieved by water companies in the past. It might be argued that the NEC is more efficient than actual water companies observed historically and therefore capable of outperforming the stretching cost allowances set for it. However, that the NEC has more stretching cost allowances set for it than at previous price reviews might suggest it will be more difficult to outperform those allowances over AMP7 than in the past. Moreover, it does not seem reasonable to assume that a NEC is capable of outperformance significantly in excess of that achieved by actual companies in the past.

Historical expenditure data for water companies appears to show that there are significant variations between the actual and allowed expenditure. For example, our analysis indicates:

- 13 out of 18 companies have underspent opex allowances by more than 10% in AMP5;
- 10 out of 18 companies have underspent wholesale totex allowances by more than 10% in 2015/16; and
- 8 out of 17 companies have underspent wholesale totex allowances by more than 10% in 2016/17.

Based on this data, it does not appear unreasonable to expect a NEC to expect to be able to outperform its totex allowances and to achieve some totex rewards, though caution should be applied to interpreting the data from 2015/16 and 2016/17 in particular because a simple comparison of actual and allowed totex does not explain why actual expenditure is lower than allowed expenditure e.g. whether it is due to efficiency improvements, changes in circumstances which have meant that certain planned expenditures no longer needed to be undertaken or because of delays in delivering aspects of the totex programme (meaning the expenditure will be “caught up” later in the AMP). Outperformance may be better judged over the course of an AMP, rather than a couple of selected years. While some outperformance of cost allowances may be possible, noting how challenging Ofwat has stated it intends to be when setting cost allowances at PR19, the outperformance which might be reasonably expected to be possible for a NEC may be lower than the levels achieved historically.

4.1.2 Would out/underperformance by 10% give rise to a +/- 2% contribution to RoRE?

The answer to this question depends on the relative magnitudes of allowed expenditures and regulatory equity and on the strength of cost out/underperformance incentives. The main cost performance incentives proposed by Ofwat for PR19 are:

- the totex incentive scheme for water resources, water network plus and sewerage network plus;
- separate totex cost sharing arrangements for bio-resources; and
- another totex cost sharing arrangement for residential retail.

Cost sharing incentives for water resources, water network plus and sewerage network plus²⁸

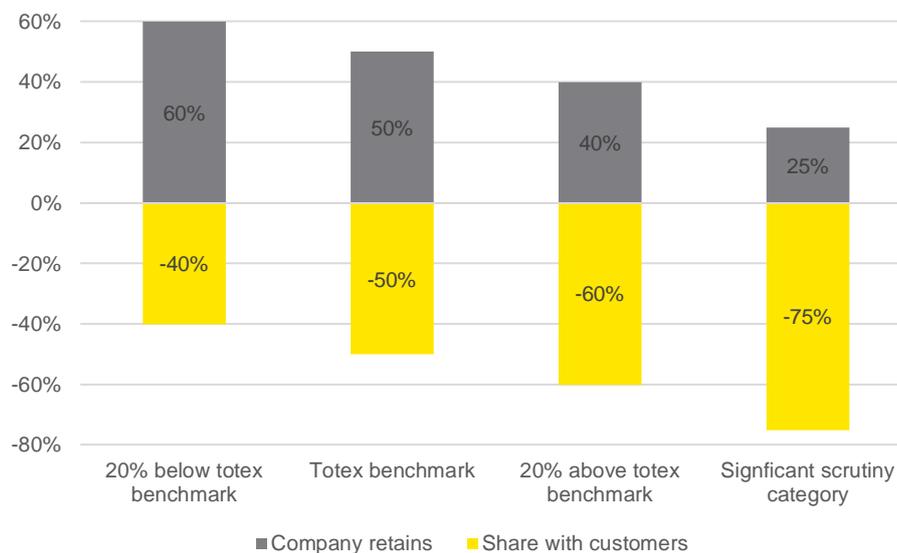
The cost sharing incentive will reward companies that outperform the cost allowance (i.e. underspend) and penalise companies that underperform against the cost allowance (i.e. overspend). The sharing rate determines how much of the amount of any difference between actual expenditure and allowed expenditure is returned to customers and how much of it is retained by companies. The size of the sharing rate depends on how close the company's costs in its business plan are to Ofwat's determination of the cost allowance.

For a company which proposes cost allowances in its business plan equal to Ofwat's assessment of efficient expenditure, the company would retain/incur 50% of any out/underperformance of Ofwat's cost allowances. Different cost sharing rates would apply to companies which proposed cost allowances in their business plans which were higher or

²⁸ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p166ff for further details.

lower than Ofwat's assessment of efficient expenditures. The cost sharing rates are asymmetric in most cases: companies which propose cost allowances less than Ofwat's proposed cost benchmark will retain more of the outperformance than they will bear of any underperformance, but companies which propose cost allowances higher than Ofwat's proposed cost benchmark will bear more of the underperformance than they will retain of any outperformance. Some of the different cost sharing rates are illustrated in Figure 4 below.

Figure 4: Ofwat's proposed cost sharing rates



Source: EY analysis, Ofwat (2017) *Delivering Water 2020: Consulting on our methodology for the 2019 price review* (Figure 9.1)

Since the NEC would, under our definition, have costs equal to Ofwat's assessment of efficient expenditure, the cost sharing rate for the NEC would be symmetric at 50% for outperformance and 50% for underperformance.

Cost sharing incentives for bio-resources and residential retail

Ofwat states that it is planning to apply the “cost sharing mechanism for ... water network plus, wastewater network plus and the water resources controls” but not to bio-resources and retail, which are average revenue controls.²⁹ This means that companies will bear 100% of any over or underspend in the bio-resources and residential retail price controls. The presence of volume drivers in these price controls (i.e. allowed revenues adjust automatically if demand increases or decreases) means that companies have some protection against cost over or underspends due to changes in volumes of activity, but because the unit cost (average revenue) is fixed, regardless of the volume of activity undertaken, companies will bear significant risks of cost over or underspends due to changes in unit costs of these activities.

It is outside the scope of work of this report to try and assess the proportion of cost over/underspends which might be borne by companies in these two price controls, but in the absence of this analysis we assume for the purposes of this report that the proportions of over/underspends would be similar in these price controls to in the total revenue controls.

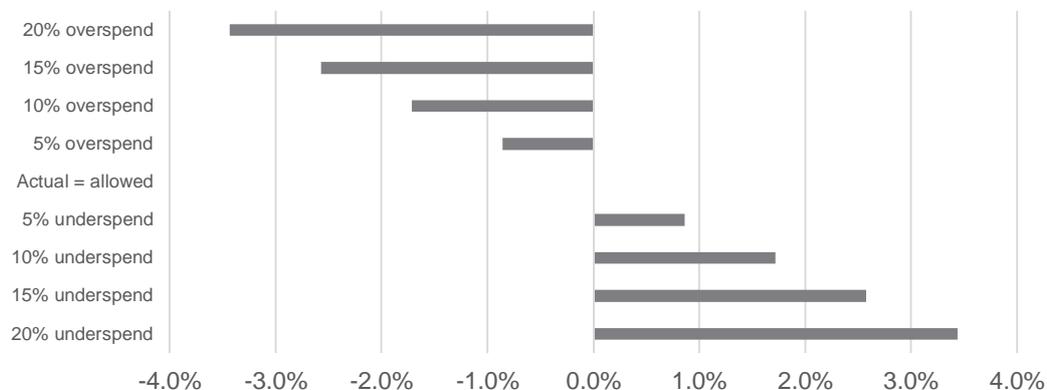
Would these cost sharing rates mean that outperformance of expenditure allowances by 10% is equivalent to +2% of RoRE?

As outlined above, we assume that a NEC would face a cost sharing rate for any out/underperformance of 50%. To test what impact this would have on RoRE at PR19, we have reviewed Ofwat's “cost sharing spreadsheet model”, published alongside its PR19

²⁹ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p166.

methodology consultation.³⁰ Our assessment of the impact of the sharing mechanism on RoRE, illustrated in Figure 5 below, suggests that the impact on RoRE would be slightly lower than the 2% Ofwat proposes at about +/- 1.7% of RoRE.³¹

Figure 5: Impact on RoRE of different levels of expenditure for a NEC³²



Source: EY analysis based upon Ofwat's Cost sharing spreadsheet model

4.2 Service standards

Ofwat state that companies should be able to earn/incur rewards/penalties up to 2% of RoRE by out/underperforming on their PCs. This raises the question as to whether a NEC could out/underperform its target service levels and achieve net rewards/penalties that would give rise to a +/- 2% contribution to RoRE? We consider this question below.

Ofwat has proposed that companies' PCs should include stretching target levels of service, in some cases at the upper quartile level of service. The extent to which the NEC could reasonably expect to outperform these levels of service is unclear. As was the case for the cost efficiency targets discussed above, Ofwat needs to demonstrate that the assumed level of outperformance of target levels of service is realistic. Some evidence that the NEC could reasonably be expected to outperform the target levels of service by the amount assumed by Ofwat needs to be advanced.

Ofwat might argue that some outperformance of the committed service levels by the NEC could be reasonably expected to be possible given that (i) "exceptional" companies will be expected to deliver even higher standards of service than "fast track" companies (the category we assume that the NEC belongs to) and (ii) the target level of service is to be set at the upper quartile level for some areas of performance (rather than at the efficient frontier). However, it is not clear how much outperformance might be achievable since it is not clear how much more stretching the committed service levels of an "exceptional" company will be than the corresponding levels of service committed to by a "fast track" company.

Three other pieces of evidence which are relevant to the scale of outperformance Ofwat assumes that a NEC is capable of are:

- the performance of actual companies relative to their existing PCs so far over PR14, though we note that the definitions of PCs will be revised for PR19. Our analysis indicates that in 2016/17, committed performance levels were met for 266 out of 388 (69%) PCs for which companies clearly stated they had either met or not met those committed performance levels;³³

³⁰ See Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology; cost sharing spreadsheet model](#).

³¹ We assume that Ofwat's spreadsheet technically only applies to totex for water resources, water network plus and wastewater network plus, but for the reasons discussed above we assume that the cost sharing arrangements in the bio-resources and residential retail price controls would be similar. We have therefore assumed that Ofwat's spreadsheet model applies at an Appointee level, not just to the three total revenue controls.

³² This analysis draws upon the table in Ofwat's spreadsheet, plotting the values in the RoRE table for different out-turn costs under the scenario where the business plan totex (100) is equal to Ofwat's baseline view (100).

³³ Analysis based on Table 3A of the Annual Performance Report Industry Data Share. Companies also had a range of PCs which did not have reported data or it was not clear if the committed performance level had been met.

- for the NEC to achieve RoRE upside of 2% through ODIs, this is roughly equal to between 10-15% outperformance of cost allowances, which is clearly a very significant level of outperformance; and
- Ofwat has stated that “an average company with average performance would expect to incur penalties on its ODI package, rather than rewards”³⁴ and that “companies will need to justify why they do not intend to continue with any of their PR14 performance commitments ... particularly if the company was performing badly on the performance commitment during the last control period”.³⁵ This suggests that the NEC would need to be reasonably expected to be capable of significantly outperforming an average company in order to achieve net positive ODI rewards of the scale Ofwat has assumed.

Noting the above, it is not clear how much outperformance of PCs the NEC might be reasonably assumed to be capable of. However, assuming that the targeted levels of service can be outperformed, whether that outperformance be reasonably expected to give rise to a 2% contribution to RoRE for the NEC depends on the strength of ODI rewards available to the NEC. In this respect, we note that Ofwat has proposed that companies calibrate these ODI rewards in a similar way to PR14 i.e. taking into account customer valuations of the higher standards of service and the cost sharing rate (which plays a role in allocating the benefits of higher standards of service between customers and companies).³⁶

It is not clear at this stage whether customers will support the scale of ODI rewards Ofwat has assumed – customer research is ongoing for PR19 – but we note that customers did not generally support ODI rewards of this magnitude at PR14.³⁷ We note that additional customer engagement through revealed preferences and behavioural economics (techniques in addition to the stated preference willingness to pay analysis primarily used at PR14) requested by Ofwat for PR19 could produce different customer valuations to those identified at PR14.³⁸ However, it is not obvious why customers would be willing to support significantly larger rewards now than they did at PR14 (when ODI rewards contributed a much smaller proportion of RoRE upside than Ofwat proposes for PR19) and incremental service improvements were off a lower base PC (meaning customers’ marginal utility from incremental service improvements should have been higher).

4.3 CMeX / DMeX

Ofwat’s indicative RoRE ranges indicate that companies should be able to earn/incur rewards/penalties up to 0.5% of RoRE by out/underperforming on the CMeX and DMeX mechanisms. This raises the question whether a NEC could out/underperform the CMeX and DMeX target service levels by a sufficiently large amount to achieve rewards/penalties which give rise to a +/- 0.5% contribution to RoRE.

Ofwat has proposed that the top three companies ranked by their CMeX performance would receive a reward of up to 1.2% of residential retail revenues each year (adding up to 6% over AMP7). A further reward of another 1.2% p.a. of residential retail revenues could be achieved if the company is not only in the top three within the water sector, but also achieves upper

³⁴ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p71.

³⁵ See Ofwat (2017) [Delivering Water 2020: Consulting on our methodology for the 2019 price review](#), p62.

³⁶ See Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology: Appendix 2: Delivering outcomes for customers](#), pp73-74 for Ofwat’s proposed approach at PR19. See also Ofwat (2013) [Setting price controls for 2015-20 – final methodology and expectations for companies’ business plans: Appendix 1 – Integrating the calibration of outcome delivery and cost performance incentives](#), July, which sets out a similar approach at PR14.

³⁷ Ofwat has noted that “Financial ODIs deliver benefits to customers, but the way in which they do this is not always obvious to customers. It became clear during PR14 that customers supported financial ODI rewards when the context was properly explained, such as the absence of rewards for stretching levels of service performance being likely to imply a higher cost of capital for companies and higher bills for customers. We explain this context in the introduction section above.” see Ofwat (2016) [A consultation on the outcomes framework for PR19](#), November, p23.

³⁸ We note that Ofwat has suggested companies may consider other types of evidence about customers’ valuations of incremental service improvements in addition to those considered at PR14: see Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology: Appendix 2: Delivering outcomes for customers](#), p73. It is not clear if this additional evidence will lead to higher customer valuations of incremental improvements in service standards.



quartile performance on the UK Customer Satisfaction Index (UKCSI), a measure of customer satisfaction across a wide range of industries (not just water or utilities).³⁹

Ofwat's own analysis indicates none of the water companies is currently in the upper quartile of the UKCSI and only one company was even close to achieving this based on 2015/16 SIM scores data.⁴⁰ It is not clear how likely it is that the NEC could achieve upper quartile performance on the UKCSI, noting that the NEC would not be as efficient as the leading companies in the sector (which would be in the "exceptional" category whereas the NEC would be in the "fast track" category).

Assuming that outperformance can be achieved, whether the scale of rewards proposed by Ofwat equates to 0.5% of RoRE needs to be considered. In this respect, our analysis of PR14 Final Determinations data indicates that 12% of residential retail revenue equates to only about 0.35% of RoRE, short of Ofwat's 0.5% target.⁴¹ And, as noted above, the 12% outperformance assumes very strong performance. It is not clear therefore that a NEC could reasonably be expected to be capable of performing strongly enough on CMex and DMeX to earn a full 0.5% upside on RoRE at PR19.⁴²

4.4 RoRE as a Package

The discussion above has considered each of the core components of Ofwat's RoRE range in isolation. It does not take into account any relationships or correlations between performance in each of these areas e.g. whether it is plausible to assume that a company can be a leading performer across cost efficiency and service standards. To test whether it is reasonable to assume that a NEC could out/underperform simultaneously on cost efficiency, PCs and CMex/DMeX we have considered historical outturn performance data across eight areas relating to cost efficiency, standards of service and financing for 2015/16 and 2016/17:

- ▶ Wholesale water totex outperformance (relative to PR14 FD) in percentage terms;
- ▶ Wholesale wastewater totex outperformance (relative to PR14 FD) in percentage terms;
- ▶ Household retail cost to serve outperformance (relative to PR14 FD) in percentage terms;
- ▶ Net ODI rewards (or penalties) in £m terms, expressed as a percentage of total wholesale totex;
- ▶ Percentage of PCs met, both financial and non-financial;⁴³
- ▶ SIM score;
- ▶ Cost of debt i.e. weighted average interest rate in percentage terms; and
- ▶ Rate of return on RCV in percentage terms.

The results of this analysis for 2016/17 are presented in Figure 6 below. It is clear from this analysis that all companies have at least one or two areas where their performance is mid-ranking or lower. Or, put differently, no company is a high ranking performer across all of these areas. The results for 2015/16 (not presented) show a similar picture. This suggests it is difficult for a company to outperform across all areas of the price control and that even a NEC would be unlikely to be able to outperform totex, ODIs and CMex/DMeX and achieve the upper end of the RoRE ranges proposed by Ofwat for PR19.

³⁹ See Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology; Appendix 2: Delivering outcomes for customers](#), p97.

⁴⁰ See Ofwat (2017) [Delivering Water 2020: consultation on PR19 methodology; Appendix 2: Delivering outcomes for customers](#), Figure 4.3, p98.

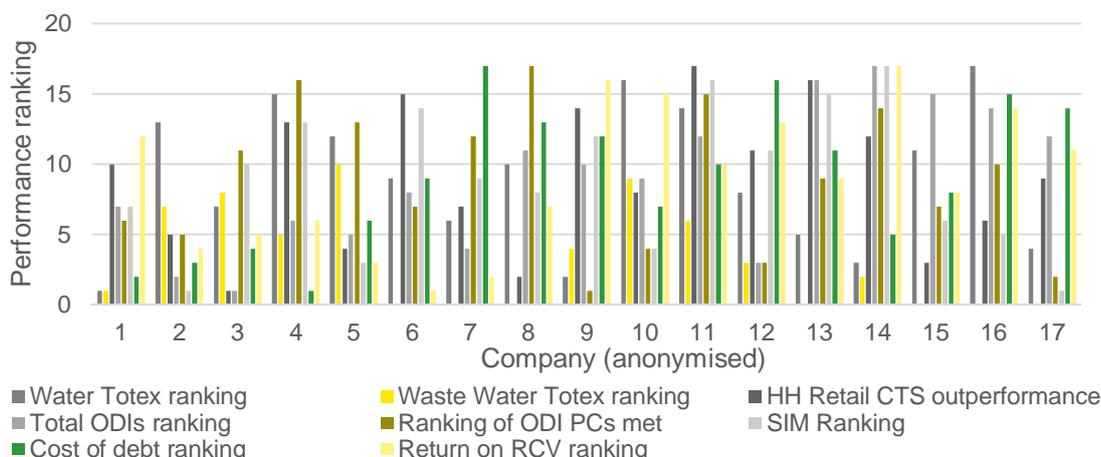
⁴¹ We also note that since these calculations are based on PR14 data, the results could be different if applied to PR19 data. However, if the relative scale of residential retail revenue and regulatory equity remain the same, the results presented would be applicable.

⁴² We note that Ofwat's 0.5% of RoRE upside combines both the CMex and the DMeX. The potential rewards under the DMeX are up to 5% of developer services revenue. However, we have not been able to calculate what percentage of regulatory equity this equates to, but we assume it would be very small (and not large enough to fill up the remainder of Ofwat's 0.5% of RoRE upside claim).

⁴³ The analysis only includes PCs for which companies reported whether they had actually met or failed to meet the PC. PCs with missing data were excluded.



Figure 6: Water company performance rankings across various areas: 2016/17



Source: EY analysis of 2016/17 Annual Performance Reports and PR14 Final Determinations.

Recognising that the analysis above covers a short period of time and is constrained to English and Welsh water companies, we have also considered pairwise correlations between some of the areas of performance over a longer historical period and for British energy networks.

The results of these pairwise correlation tests are presented in Table 2 below.⁴⁴ Further graphical analysis of some of these relationships are presented in Appendix 1.

Table 2: Correlation of company totex and service standards performance rankings

Period	Year	Test	Correlation	#
PR09	2010-15	Company SIM score ranking and their ranking on opex performance.	Slightly positive + 0.2	18
PR14	2015/16	Company ODI rewards and penalties against totex outperformance	Slightly negative - 0.2	18
	2016/17	Company ODI rewards and penalties against totex outperformance	Slightly positive + 0.2	17 ⁴⁵
	2015-17	Company ODI rewards and penalties against totex outperformance	No correlation 0	35
RIIO-ED1	2015/16	DNO outcome ⁴⁶ rewards and penalties against totex outperformance	Slightly negative - 0.1	14
	2015/16	DNO Group ⁴⁷ outcome rewards and penalties against totex outperformance	Negative - 0.3	6
RIIO-GD1	2015/16	GDN outcome rewards and penalties against totex outperformance	Negative - 0.3	8
	2015/16	GDN Group ⁴⁸ outcome rewards and penalties against totex outperformance	Positive +0.4	4

Source: EY analysis of industry data

The results show that there is no clear positive between company rankings of cost efficiency and service standards performance in the water sector over AMP5 or AMP6. Evidence from energy networks' performance is also mixed and does not suggest companies which are leading performers on cost efficiency are also leading performers on service standards.

⁴⁴ The method which we have followed is to assess the out-turn cost against the allowance in percentage terms for each company or entity, and rank them from highest to lowest performance. We then ranked the performance of the observed quality of service metrics. For PR14 and RIIO we added the various rewards and penalties together, and then divided them by the totex allowance (to normalise them), and then ranked them from highest to lowest performer. We then took the two performance rankings (for totex and incentives) and performed a basic correlation.

⁴⁵ Sembcorp Bournemouth Water was acquired by South West Water in 2015 (see Competition and Markets Authority (2015) [South West and Bournemouth Water merger referred for in-depth investigation](#), 8 June), reducing the number of companies in the sample by one from 2015/16 onwards.

⁴⁶ By "outcome rewards and penalties" we mean financial rewards and penalties earned by energy networks for performance against service incentives. Ofgem uses the term "outcome" to refer to the measures of performance (service standards) valued by customers.

⁴⁷ The 14 electricity distribution network operator (DNO) licenses are owned by six DNO Groups.

⁴⁸ The eight gas distribution network (GDN) licenses are owned by four GDN Groups.



Overall, this evidence suggests – in line with the earlier analysis of water company performance across a wider range of areas – that it may be difficult to reasonably expect a NEC to outperform strongly on both cost efficiency and service standards (PCs and CMeX/DMeX) and therefore achieve RoRE towards the upper end of Ofwat’s proposed range for PR19.⁴⁹

4.5 Summary

In order to balance its various duties, there are limits on Ofwat’s discretion to define the NEC and to assume the extent of any out/underperformance that the NEC may be able to achieve and the rewards/penalties that may follow (expressed in RoRE terms). For example, it would be difficult to justify assuming that the NEC was twice as efficient as actual water companies, or, conversely, that the NEC was only half as efficient as actual water companies. The former would undermine investor confidence in the sector and ultimately increasing the cost of capital to the detriment of customers. The latter would evidently not be in customers’ interests as it would represent a deterioration in value for money.

Appropriate supporting evidence needs to be advanced to justify the choices that are made about the NEC. Based on our analysis the NEC at PR19 may not face RoRE ranges which are similar to those proposed by Ofwat for a “fast track” company because:

- the cost and service standards (including CMeX and DMeX) targets Ofwat proposes to set are likely to be very stretching, which may make significant outperformance difficult;
- customers may not support the required ODI rewards needed to achieve the +2% RoRE upside Ofwat has assumed;
- companies may not be able to achieve the maximum CMeX and DMeX rewards assumed by Ofwat, since the NEC would need to achieve both top three performance within the industry and upper quartile performance across the UKCSI in order to achieve the whole 0.5% RoRE upside on CMeX and DMeX;
- historical performance information for both water companies and energy networks suggests individual companies do not tend to be leading performers across both cost efficiency and service standards and consequently it would be unlikely for a NEC to reasonably be assumed to be able to achieve the upper limits of the proposed RoRE range (which requires outperformance across several categories of performance).

A consequence of the above analysis is that the RoRE range faced by the NEC at PR19 would likely be skewed to the downside since some of the financial rewards Ofwat assumes contribute to RoRE upside do not appear reasonably likely to be achievable. The consequences of a negatively skewed RoRE range and the adjustments to the risk and reward package that may be required to correct that are discussed in more detail in the next section.

⁴⁹ We note that the evidence we have considered here is not perfect for informing views about a NEC since different companies in the samples will have different levels of efficiency in the first place, therefore masking the relationships between cost efficiency and service standards performance. Ideally, the analysis would focus on the most efficient companies only and see if those companies were able to out/underperform across a number of areas, but it is difficult to identify the best performers in practice because (a) Ofwat’s cost assessment models are imperfect and do not therefore necessarily provide an accurate measure of efficiency; (b) the cost allowances set at PR14 involved combining a number of models and adjustments, so outperformance of the assumed cost allowances is not necessarily an indication of outperformance of an efficient level of expenditure; (c) many of the PCs and ODIs used at PR14 were not directly comparable across the industry, making it difficult to identify which companies are actually leading performers in particular areas of service. It may also be worth considering information about expected out/underperformance across cost efficiency and service standards, such as statements by listed water companies (see, for example, United Utilities (2016) [Annual Report](#)) or by equity analysts, but we have not been able to compile a sufficiently large and comparable data set of this kind of information to undertake meaningful analysis.

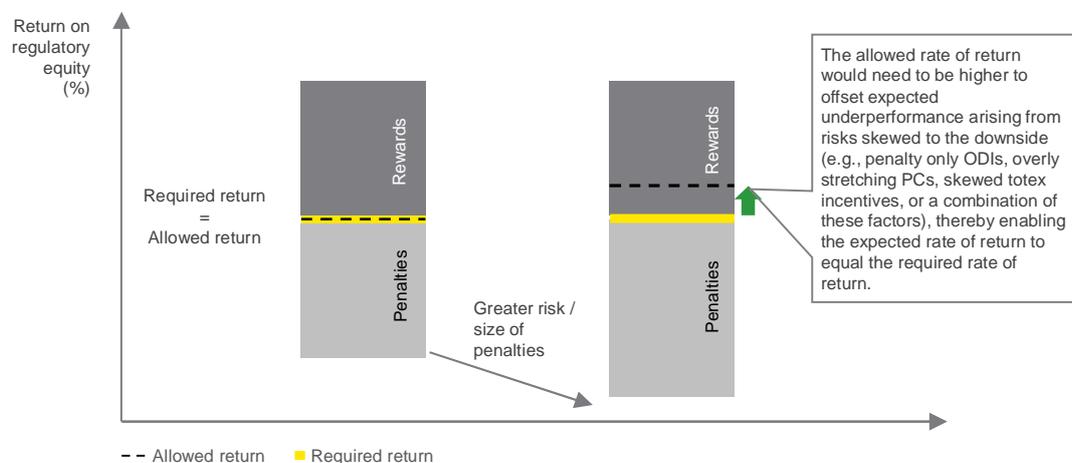
5. Does the shape of the RoRE range faced by a notionally efficient company have any implications for how the risk and reward balance should be calibrated for that notionally efficient company?

The discussion above has identified that the RoRE ranges faced by the NEC at PR19 may be skewed to the downside (because some of the upside assumed by Ofwat may not be achievable in practice).

One potential solution to this issue could be to revisit the calibration of cost efficiency targets, cost sharing incentives, PCs, ODIs and CMeX/DMeX to increase the amount of RoRE upside available. However, noting that one of the constraints on the RoRE upside may be limited customer willingness to pay for ODI rewards, increasing RoRE upside may also involve re-balancing the contributions of different types of outperformance to the RoRE range e.g. more RoRE upside may have to come from totex than ODIs.

Another potential solution could be to adjust the allowed cost of equity to restore the balance between investors' required rate of return on equity and the expected rate of return. As Ofwat has previously recognised, investors would require a higher allowed cost of equity in order to expect a rate of return equal to their required rate of return: '[i]f investors were asked to invest in companies with a regulatory system that only allowed for penalties, or downside risk, customers would pay for this through a higher cost of capital'⁵⁰. This is illustrated below in Figure 7.

Figure 7: Impact of skewing the RoRE range on the required and allowed rates of return



We note that since our analysis has focused on the NEC, the implied skewness of RoRE ranges would be applicable across the industry and would therefore be more difficult to diversify. It might therefore be considered systematic risk within a Capital Asset Pricing Model (CAPM) framework, though we note the CAPM assumes that the probability distribution of expected returns is normally (and therefore symmetrically) distributed and so not ideally suited to addressing asymmetric risks.⁵¹ Taking these asymmetric risks into account when setting the allowed cost of equity may require applying an uplift to the cost of equity, either within the asset beta or to the cost of equity directly.

⁵⁰ See Ofwat (2016) [A consultation on the outcomes framework for PR19](#), November, pp6-7.

⁵¹ Ofwat has recognised that "asymmetric risks could lead to downside risks, not captured through the Capital Asset Pricing Model (CAPM), which could require investors to be compensated through a higher return, or alternatively to a lower return in cases where there is greater potential for upside": see Ofwat (2016) [Water 2020: our regulatory approach for water and wastewater services in England and Wales: Appendix 3: Tackling water scarcity: further evidence and analysis](#), p31.

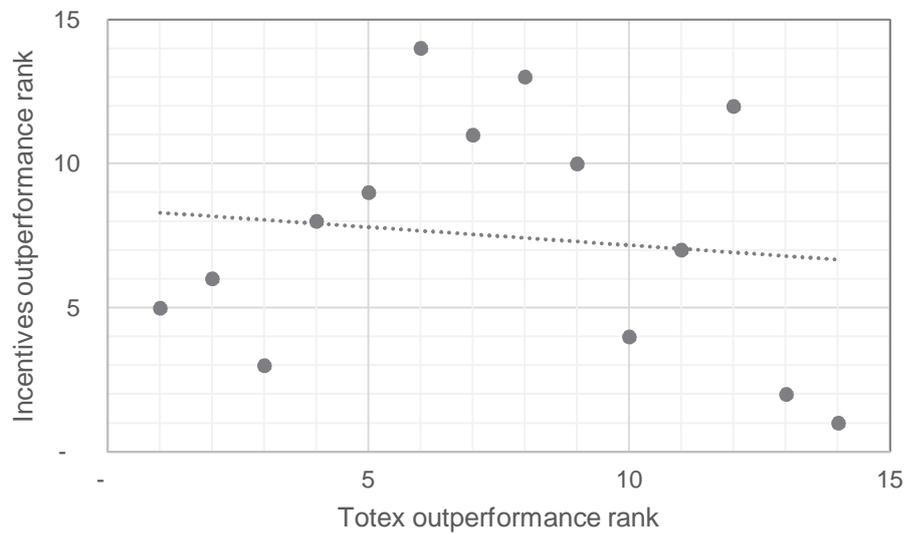


Appendix 1: Further information on the relationship between cost efficiency and service standards

Figure 8: PR14 framework - 2016 totex outperformance v ODI outperformance



Figure 9: RIIO-ED1 framework - 2016 totex outperformance v outcomes outperformance



Authors of the report



Anthony Legg

Head of Power & Utilities, Economic Advisory

Office: + 44 20 7951 6129

Mobile: + 44 7753 300 520

Email: alegg@uk.ey.com



Christian Speedy

Power & Utilities, Economic Advisory

Office: + 44 20 7760 9422

Mobile: + 44 7500 097 688

Email: cspeedy@uk.ey.com

Key contacts



Matt Corkery

Head of Economic Advisory

Office: + 44 20 7951 6121

Mobile: + 44 7801 459 569

Email: mcorkery@uk.ey.com



Tony Ward

Head of Power & Utilities, UK & Ireland

Office: + 44 121 535 2921

Email: tward@uk.ey.com



EY | Assurance | Tax | Transactions | Advisory

Ernst & Young LLP

© Ernst & Young LLP. Published in the UK.
All Rights Reserved.

The UK firm Ernst & Young LLP is a limited liability partnership registered in England and Wales with registered number OC300001 and is a member firm of Ernst & Young Global Limited.

Ernst & Young LLP, 1 More London Place, London, SE1 2AF.

ey.com