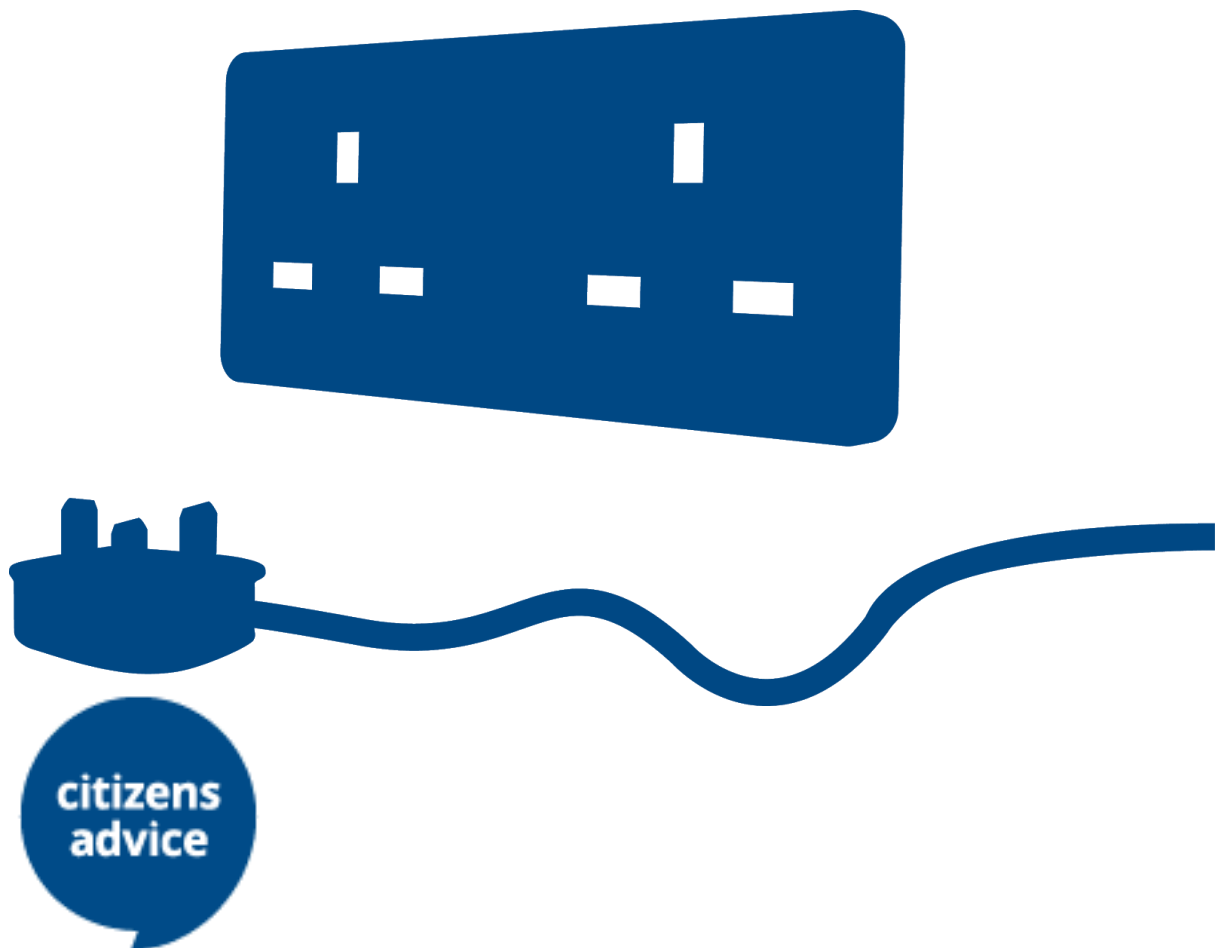


# **Ofgem RIIO-ED2**

## **Methodology consultation**

### **Annex 3 Finance Section**

Citizens Advice submission  
October 2020



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This is the fourth of 4 submissions in response to the RIIO-ED2 Sector Specific Methodology consultation. Please read our first response which contains our Executive Summary as this provides context to the responses in this section.

We anticipate that the recent decision by the CMA on the cost of capital in response to the PR19 appeal will be a consideration for Ofgem in setting levels for RIIO-2. We stand by the central claim below that there is a demonstrable and persistent legacy of regulators setting the cost of capital too high. Citizens Advice will seek to provide a further response to the CMA decision and the implications for water and energy sectors.

# 1. Regulatory Finance Response

In this section, we present evidence that there are a number of ways Ofgem is still overestimating the cost of capital and undervaluing the protections for investors introduced for GD&T draft determinations.

## **We have 8 key recommendations for Ofgem for a lower cost of capital:**

- **Equity beta** - Our analysis shows that Ofgem should apply an asset beta of at most 0.30, rather than 0.34-0.39, and a corresponding notional equity beta of at most 0.56, rather than 0.66-0.79. This alone would imply a reduction in Ofgem's allowed return on equity to at most 2.87%.
- **Total Market Returns (TMR): diversified portfolios** - TMR shouldn't just be based on the average returns on UK equities, but on the average returns on a wider and more diversified portfolio of investments. Based on this we think Ofgem's TMR of 6.25% to 6.75%, is too high, and should be a maximum of 4.0%.
- **Total Market Returns: actual market returns** - Ofgem should take account of forecasts which show that the market is expecting lower returns than Ofgem's analysis of historical returns. Ofgem's TMR assumption based on historical averages (6.25%-6.75% CPIH real) is higher than Ofgem's own data on forecasts from investment managers (4.8% CPIH real).
- **Cost of Equity** - Ofgem's cross-checks source data suggests a cost of equity of 3.1% compared to Ofgem's assumption of 4.2%

- **Outperformance** - We suggest a minimum adjustment of 1.6% half of the amount of expected outperformance by investors of 3.2% revealed by market to asset ratios.
- **Ex Post adjustment** - We disagree with Ofgem's proposed ex post adjustment. It is not necessary and is a one-sided measure for which consumers bear all the down-side risk with no upside.
- **Return Adjustment Mechanism (RAM): debt windfall** - We think it would therefore be reasonable to include debt costs in the RAM to provide an additional safeguard for consumers.
- **Return Adjustment Mechanism (RAM): lower beta** - We also consider that the RAM reduces the riskiness of the regulated companies for investors which should be reflected in a lower beta.

## 1.1 Equity beta

We argue that Ofgem (and also Ofwat in the PR19 water price control) have materially over-estimated the level of systematic risk facing the UK regulated energy and water companies, and therefore the corresponding equity betas for the RIIO-2.

On the basis of the longer-run raw betas estimated in the Wright and Robertson report – of 0.3-0.5 – Ofwat's asset betas in PR19 would fall from 0.36 to 0.21-0.30, and notional equity betas from 0.71 to 0.33-0.55. **Accordingly, Citizens Advice considers that Ofgem should apply an asset beta of at most 0.30, not 0.34-0.39, and a corresponding notional equity beta of at most 0.55, not 0.66-0.79. This alone would imply a reduction in Ofgem's allowed return on equity to at most 2.91%.**

## 1.2 Total Market Returns and RoRE

In this section we argue Ofgem (and Ofwat in PR19) have potentially under-estimated TMR. We argue the TMR should not just be based on the average returns on UK equities and what impact this has on RoRE and TMR. Adjusting this to the same basis as **Ofwat's and the CMA's estimated TMR in the NERL appeal (suggests that Ofgem's TMR of 6.25% to 6.75%, and Ofwat's TMR of 6.50% are too high, and should be closer to 4.0%.**

Further, Ofgem should consider adjusting its use of historical market returns as a proxy for current forecast total market returns and take account of actual

market forecasts which show that the market is expecting lower returns than Ofgem's analysis of historical returns. **We find Ofgem's TMR assumption based on historical averages (6.25%-6.75% CPIH real) is higher than that actually expected by investors as shown by Ofgem's own data on forecasts from investment managers (4.8% CPIH real).** We also assess Ofgem's use of cross-checks for its cost of equity and find that its approach generates a higher cost of equity than is supported by the source data. **The underlying data suggests a cost of equity of 3.1% compared to Ofgem's assumption of 4.2%. We suggest Ofgem updates its cross-checks analysis to ensure it provides consistent and comparable evidence to its CAPM derived assumptions.**

### **Outperformance and ex post adjustment**

We encourage Ofgem to stick with its analysis that suggests a much higher level of expected outperformance than put forward in the draft determination. Our analysis of Ofgem's data suggest actual levels of expected outperformance by investors of 3.2% are revealed by market to asset ratios. On that basis we suggest a minimum adjustment of half of that amount, reflecting that this is the first use of this improvement to the CAPM based methodology for setting a cost of equity. **We propose an outperformance adjustment of 1.6%.**

**We strongly disagree with Ofgem's proposed ex post adjustment.** It is not necessary and is a one-sided measure for which consumers bear all the down-side risk with no upside.

### **Return Adjustment Mechanism RAM**

Notwithstanding the benefits of using an indexation approach for the cost of debt, we are concerned that companies may still generate windfall gains for shareholders as a result of debt outperformance. In our view it would therefore be reasonable to include debt costs in the RAM to provide an additional safeguard for consumers.

We also consider that the RAM reduces the riskiness of the regulated companies for investors which should be reflected in a lower beta. This should be either taken into account explicitly in determining beta or would support the adoption of a beta at the bottom of any market-based beta.

### **Equity beta**

We argue that, based on the evidence available, the equity beta for energy companies is lower than the estimate Ofgem used in their determinations. Firstly, we consider how Ofgem proposes to determine the equity beta for the regulated energy network companies. Secondly, we outline why energy and water networks companies are likely to hold similar low systematic risk and consider an alternative approach to betas for the RIIO-2.

### **Ofgem's approach**

In the 2019 RIIO-2 Sector Specific Methodology Decision (“SSMD”)<sup>1</sup>, Ofgem proposed to estimate “*forward-looking*” equity betas for the regulated network companies by looking at the historical correlations between the share prices of listed regulated utilities and stock market indices, such as the FTSE All-Share index, following the methods described in the UKRN 2018 cost of capital study<sup>2</sup>. In particular, the SSMD proposed to use “*outturn data over long periods of time of at least 5 years, primarily using [ordinary least squares (OLS)], with [generalised autoregressive conditional heteroscedasticity (GARCH)] as a cross-check*”<sup>3</sup>. Ofgem nevertheless stated that its approach to beta estimation was pending its review of “*the overall systematic risk of the RIIO-2 price control*”.

In the subsequent RIIO-2 draft determinations, Ofgem has said that “*given the uncertainty of any beta estimate, Ofgem has considered a range of estimation approaches and averages*” – based on “*raw equity beta estimates for SSE, National Grid plc (NG), Pennon (PNN), Severn Trent (SVT) and United Utilities (UU), using a combination of estimation windows and averaging periods*” – and that “*such raw equity betas indicate a majority of the values between 0.55 and 0.70*”<sup>4</sup>.

Furthermore, the draft determinations find that the relative systematic risk of GB energy networks is similar to the corresponding risk for GB water networks, based on work by CEPA, and therefore that the beta (and overall allowed return on capital) for the energy and water companies should also be similar<sup>5</sup>.

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<sup>1</sup> Ofgem, [RIIO-2 Sector Specific Methodology Decision – Finance](#), Ofgem, May 2019, §3.106.

<sup>2</sup> Wright, Burns, Mason and Pickford, Estimating the cost of capital for implementation of price controls by UK Regulators, report for UKRN, 2018.

<sup>3</sup> Ofgem, [RIIO-2 Sector Specific Methodology Decision](#) – Finance, §3.176.

<sup>4</sup> Consultation - RIIO-2 Draft Determinations – Finance Annex, Ofgem, July 2020, §3.32-3.33.

<sup>5</sup> Consultation - RIIO-2 Draft Determinations – Finance Annex, §3.57.

## **Energy and water networks company are likely to hold similar systematic risk during RIIO-2 and PR19 respectively**

Citizens Advice strongly agrees with Ofgem's finding that the regulated energy network companies are likely to face similar levels of systematic risk (also known as "non-diversifiable" risk) during the RIIO-2 price control review period as the regulated water companies during PR19, for the reasons as described in CEPA's report for Ofgem that:

*"GB energy and water regulated utilities exhibit many similarities in factors that might be considered to affect systematic risk and, therefore, asset beta [...in particular] regulatory protections of value, price control building blocks and firm characteristics are all broadly similar, as is the current industry structure in terms of maturity and elasticity of demand, prevalence of competition and position in the investment cycle. [page 5 and §2.4]*

*The overall judgement reached [as to the relative systematic risk facing the energy and water companies] is in some cases sensitive to the weighting of different categories of risk:*

- *Within the 'Market risk' category the overarching regulatory framework is very similar between the two sectors [energy and water], and the current structure of demand, exposure to competition, investment cyclicity and political risk is arguably also similar.*
- *[...] Patterns of network demand and investment intensity are arguably greater sources of uncertainty in the energy sector than in the water sector [...albeit] this uncertainty may continue to be mitigated under a stable regulatory framework and [...] may be more idiosyncratic than systematic in nature.*
- *Price control building block risk appears, if anything, slightly higher in water than in energy. [§2.24]*

*The sector risks and the regulatory regimes, particularly for energy and water networks, have many closely aligned features, including that:*

- *Both energy and water sectors – current and previous price controls – have a well-established RAV framework supported by a clear licensing and appeals mechanism.*

- *Both energy and water networks are subject to revenue cap regulation which mean that operators in both sectors eventually recover their allowed revenues when demand is lower or higher than expected.*
- *While aviation services [by comparison] are considered to be more sensitive to macro-economic risks, water and energy represent an essential product with consensus that demand is inelastic, likely below 1. [§2.2.1]”<sup>6</sup>*

We agree therefore with Ofcom’s conclusion that, on the basis of CEPA’s report, *“pure-play energy networks in GB have several similar risk characteristics as pure-play GB water networks, suggesting that [the pure-play water companies Severn Trent (SVT) and United Utilities (UU)] are appropriate comparators for estimating betas for pure play GB energy networks”<sup>7</sup>.*

### **Ofgem must determine forward-looking long-run betas for the regulated energy and water companies**

Beta is a measure of the systematic risk faced by investors in equities – and/or other assets – such as regulated energy and water network company equities and bonds, on which investors expect commensurate returns. Namely, investors will only accept lower returns for equities or bonds with lower betas, as such investments help to reduce the overall volatility in a well-diversified investment portfolio. This makes the equity (and debt) beta a critical input for determining the regulated energy and water companies’ overall allowed returns.

Accordingly, Citizens Advice agrees with Ofgem that RIIO-2 should seek to determine the *“forward-looking”* betas for the regulated energy network companies focusing on the *“longest horizon available”<sup>8</sup>*, namely the betas for the RIIO-2 price control review period for long-term investors. Ofwat similarly emphasises the importance of focusing on long-term financing horizons for the water sector, as the water companies should not be reliant on short-term investors<sup>9</sup>.

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<sup>6</sup> RIIO-2: Beta estimation issues, Final report for Ofgem, CEPA, July 2020.

<sup>7</sup> Consultation - RIIO-2 Draft Determinations – Finance Annex, §3.49.

<sup>8</sup> Consultation - RIIO-2 Draft Determinations – Finance Annex, para. 1.8.

<sup>9</sup> For example, see PR19 final determinations: Aligning risk and return technical appendix, Ofwat, pages 7-8, 37.



Likewise, the 2018 cost of capital report for the UK Regulators Network (UKRN)<sup>10</sup> recommends a “fairly long horizon, for example, 10 years” for estimating regulated companies’ allowable returns, on the basis of not wanting to create a “disconnect between the horizons of the (notional) investor and the expected life of the assets employed” (which are long-lived in both the water and energy network sectors)<sup>11</sup>.

In Citizens Advice’s view, the systematic risk (and associated beta) of regulated network companies varies considerably by time. In particular, systematic risk and beta varies significantly by investor time-horizon, namely, between short-term and long-term investors. Systematic risk and beta can also vary materially by time period, for example, by regulatory price control review period.

In general, systematic risk is considerably lower for long-term investors than for short-term investors, especially for the equities and bonds of regulated utility companies. This is because short-term movement in equity and bond prices is strongly correlated with overall market indices. In comparison, long-term variation in equity and bond prices – and, moreover, underlying company financial performance – is far less correlated with overall market indices, if at all.

This arises because high levels of equity and bond market trading is in market indices, such as the FTSE All Share Index – or in near-100% components of such indices. Such trading is in order to meet supply and demand for collective investment products, such as open-ended investment companies (“OEICs”), exchange-traded funds (“ETFs”), and managed pension funds. Such collective investment products now dominate overall equity and bond market holdings in the UK and most other global capital markets. The effect of this is that, in the short-term, the covariance of index-constituent equity and bond prices (and returns) with market indices is high, independent of the underlying systematic risk applicable to individual index constituents. In comparison, it is typically only when individual equities or bonds enter or exit an index that there is a greater divergence in prices and associated returns from the index. This equity and bond market trading behaviour therefore results in a strong bias of short-term beta estimates towards “1” for all firms in a given index – based on short-term price changes (such as daily returns) – versus the underlying long-term systematic risk and beta.

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<sup>10</sup> Estimating the cost of capital for implementation of price controls by UK Regulators, by Stephen Wright, Phil Burns, Robin Mason, and Derry Pickford, 2018.

<sup>11</sup> UKRN report, pages 7 and 28-29 (the 2nd of the 10 key report recommendations).

Such high short-term covariance of equity and bond prices with market indices is also an example of “mean reversion” in asset prices and returns. This is where prices tend to fluctuate about a mean level, or grow at a mean rate, rather than follow a “random walk”. The chief cause of such mean reversion is the same index-constituent effect, i.e. that index-constituents prices tend to move together in the short-term but much less so in the long-term.<sup>12</sup>

Second, systematic risk and beta can also vary materially by time period, for example, by regulatory price control review period. This is primarily the result of changes in the regulatory and political framework, such as changes in the price control setting mechanisms.

This is highly relevant for determining beta for RIIO-2 (and PR19) owing to introduction of new uncertainty mechanisms (“UMs”) at both RIIO-2 and PR19, which provide additional protection to investors against systematic risk, by transferring systematic risk from energy and water company investors to customers, for example, in the case of RIIO-2:

*“Overall, the RIIO-2 price control exhibits lower systematic risk than previous controls, with lower sharing factors and a narrower [Return on Regulatory Equity (RoRE)] range [...than ] RIIO-1”<sup>13</sup>.*

The effect of this reduction in systematic risk must therefore mean a reduction in beta, all else being equal. Indeed, a transfer of systematic risk from investors to customers must be compensated for in lower customers prices (i.e. via lower allowed returns), otherwise it will only make customers worse off. However, betas estimated using historic share price data from previous price control review periods will not of course reflect such lower future systematic risk.

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<sup>12</sup> In contrast, under a “random walk” hypothesis (also known as the “Efficient Markets Hypothesis”), changes in equity and bonds prices (i.e. returns) in one period are independent of changes in previous periods. Under the random walk hypothesis, price changes are driven purely by underlying risk rather than by collective investment choices. In contrast, under the mean reversion hypothesis, price changes tend to be driven by a combination of collective investment choices and other “herd” behaviour. The extent of such “random walk” versus “mean reversion” market features can be measured by comparing the variance of returns over different return periods. Namely, according to the random walk/Efficient Markets Hypothesis, the variance of returns should grow linearly with return period. In contrast, under the “Mean Reversion Hypothesis”, the variance of returns should remain constant with return period. In practice, the variance of asset price returns is somewhere in between, i.e. neither linear nor constant.

<sup>13</sup> Consultation - RIIO-2 Draft Determinations - Core Document, Ofgem, July 2020, §6.11 and §2.15-2.16.

In Citizens Advice's view, these market effects and principles are strongly supported by the 2018 UKRN report, by an important appended report to the UKRN report, by Stephen Wright and Donald Robertson<sup>14</sup>, and by the reports that Ofgem has commissioned on beta estimation as part of RIIO-2, also by Donald Robertson (2018)<sup>15</sup>, by Indepen (2018)<sup>16</sup>, and again by Donald Robertson (2020)<sup>17</sup>

### **UKRN report (2018)**

It is notable that beta estimation was the most contentious matter in the UKRN report, with distinctly differing views among the report's authors. For example, 3 out of the 4 report authors argued for the importance of using longer-term data and at lower frequencies, as being more relevant to the long term horizons applied by the regulators, and accordingly, that *"regulators should take very seriously the implications of lower values of equity betas, and hence asset betas"*<sup>18</sup>. In contrast, the fourth main author<sup>19</sup> sought to dismiss such a position as "of interest [...but that the author] remain[ed] unconvinced".

Accordingly, the UKRN report went on to highlight and recommend that:

*"[...] the estimation of beta is the one component of the cost of equity where the regulator must use its judgement and discretion [...and] This places an obligation on regulators to examine the evidence as a whole, not simply relying a single approach that results in outlying estimates, in order to retain the benefits of a stable and transparent approach to setting the [regulatory allowed return]. This approach has successfully driven down the [UK regulated utility cost of capital] over the past 25 years as the perception of regulatory risk has diminished, and this stability has also contributed to a stable commercial environment within which operators have made significant dynamic efficiency improvements."*<sup>20</sup>

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<sup>14</sup> UKRN report, Appendix G: Beta Estimation for CAPM-WACC at Long Horizons, by Stephen Wright and Donald Robertson (the "Wright and Robertson report").

<sup>15</sup> Estimating beta, Donald Robertson, April 2018.

<sup>16</sup> Ofgem Beta Study – RIIO-2: Main Report Final, Indepen, December 2018.

<sup>17</sup> Re-Estimating beta, Donald Robertson, June 2020.

<sup>18</sup> UKRN report, page 9.

<sup>19</sup> Philip Burns, a Director of Frontier Economics, who might appear to have a strong interest in rejecting any approach that leads to lower beta estimates, given Frontier Economics' role advising many of the regulated water and energy companies.

<sup>20</sup> UKRN report, page 9.

Furthermore, the UKRN report noted that, when regulators use equity betas close to 1 (for example, as Ofwat has done at PR19 and Ofgem has proposed for RII0-2), that this *“effectively minimises the role of the risk-free rate as a determinant of the cost of equity [and in particular...]. In a period during which the RFR has shifted so dramatically, this has potentially major consequences, which suggests that the estimation of beta should be critically reviewed”*<sup>21</sup>.

The UKRN report then specifically asks why: *“If regulators wish to estimate the [cost of capital] appropriate to a relatively long horizon (say, 10 years), is it appropriate to estimate beta over such a short sample (often distinctly shorter than the horizon itself) and using high frequency (daily or weekly) data?”*<sup>22</sup> The report notes that the “benchmark case” in which the length or frequency of the sample used in estimation should not matter (and when high frequency estimation may be preferred) is when the returns on both the market and the individual stock are serially uncorrelated and have volatilities and correlation that are constant over time (known as “non-heteroscedastic” returns). However, if there is evidence that these conditions are not satisfied, then the length of the sample and the frequency with which returns are measured does matter a lot (as also concluded and described in detail in Donald Robertson’s report for Ofgem).

Last, the UKRN report notes that past research by Ofgem has specifically made the case that on the basis of *a priori* reasoning – i.e. from first principles – that the risk profile of cashflows for regulated businesses is almost entirely “idiosyncratic” (i.e. non-systematic risk, also known as “diversifiable” risk), namely, that such companies face almost no systematic risk, and therefore should be expected to have betas close to zero.

### **Wright and Robertson report (2018)**

The UKRN report includes an appended report by Stephen Wright and Donald Robertson on estimation of beta at longer horizons<sup>23</sup>.

This report argues that *“if [UK utility regulators] are concerned to assess the nature of systematic risk at long horizons, [they] should ensure that our estimation techniques are consistent with that horizon [whereas, in contrast...] what is now standard practice in beta estimation: the use of relatively short (2- 5 year) samples of,*

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<sup>21</sup> UKRN report, page 49.

<sup>22</sup> UKRN report, page 51.

<sup>23</sup> UKRN report, Appendix G: Beta Estimation for CAPM-WACC at Long Horizons, by Donald Robertson and Stephen Wright (the “Robertson and Wright report”).

*usually daily data [...] reflects the relatively short-term objectives of most users of estimated betas in the finance industry”<sup>24</sup>.*

Accordingly, the report specifically argues for estimation of beta based on “longer-term data and at lower frequencies”, on grounds that this is “more relevant to the long horizons used by regulators”, and that this “results in distinctly lower equity beta estimates”, namely, of raw equity beta estimates in the range 0.3-0.5 – and towards 0.3 at lower estimation frequencies – on the basis of United Utilities and Severn Trent Water, the same two listed water companies on which Ofwat and Ofgem rely on for their beta estimates<sup>25</sup>.

This compares to Ofwat’s considerably higher raw beta estimates of 0.58-0.66<sup>26</sup>, and “updated final view” of 0.63<sup>27</sup>.

### **Robertson report (2018)**

As part of Ofgem’s RIIO-2 2018 Sector Specific Methodology Consultation (“SSMC”), Ofgem commissioned a report from Donald Robertson on estimating beta.

This report particularly highlights the “time-varying” nature of beta and therefore the considerable challenges of estimating forward-looking betas, especially when based on historic data, namely:

*“It is extremely difficult to argue that beta should be treated as a constant except perhaps in the very short run. [...] Hence,] if one wishes to produce beta estimates for horizons further than days or even months the issue of time variation in the future as well as the past has to be acknowledged. [§3.1.1]*

*Least squares estimation of the CAPM model raises some issues:*

- *[...] If beta is time varying then a linear regression assuming constant coefficient is mis-specified and the model will display heteroscedasticity; and*
- *If beta is time varying then [least squares estimation] will attempt to estimate some average beta over the estimation window. Whilst this*

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<sup>24</sup> UKRN report, page G-139.

<sup>25</sup> See also UKRN report page 9.

<sup>26</sup> PR19 final determinations: Allowed return on capital appendix, page 64.

<sup>27</sup> PR19 final determinations: Allowed return on capital appendix, page 69.

*might be appropriate for portfolio analysis over short horizons, especially if beta is relatively slowly varying, if we are interested in longer run estimates of beta this requires some model of how beta evolves [over time]. [§3.2]*

*Summary:*

- *[...] The individual rolling OLS estimates can be far from the true long run beta and rather unstable. Even the average of the rolling OLS coefficients substantially overstates the true parameter.*
- *OLS using the full sample gets closer to the long run coefficient.*
- *GARCH estimation provides a good estimate of the long run parameter and also models the short run dynamics of beta. [§5.4]*

*Consistent with the discussion above the OLS estimates at lower frequencies are in much closer agreement with the long run estimates of beta obtained from the multivariate GARCH approach. As we move to lower frequencies we generally see a decline in the estimated betas. [§7]*

*Estimation can tell us something about past beta. What is more relevant for thinking about returns on assets is beta in the future. [§8]*

*Conclusion:*

1. *If beta is believed to be a constant one should use the full sample of data, at the highest frequency where accurate measurement is possible, unless there is evidence of a clear structural break in the nature of the underlying business.*
2. *However there is overwhelming evidence that beta is time varying and these variations can be quite persistent.*
3. *If beta is time varying forecasts over different horizons really need some model of how beta evolves. [...]*
9. *Using lower frequencies eliminates a lot of the heteroscedasticity and gives estimates closer to the long run betas. But this requires a much longer sample of data for estimation.*
10. *There is still the possibility of structural change. This suggests that using a rolling window may still be sensible. [§10]<sup>28</sup>*

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<sup>28</sup> Estimating beta, Donald Robertson, April 2018.

### ***Indepen report (2018)***

As part of Ofgem's 2018 SSMC, Ofgem also commissioned a report on estimating beta from Indepen, which reached similar conclusions as the UKRN, Wright and Robertson, and Robertson reports as to the difficulties in estimating long-run forward-looking betas, namely:

*"Concerns about the evidence on equity betas is that the estimates require multiple assumptions and they appear to be unstable. [p. v]*

*When considering the length of the estimation window, an important factor is the existence of structural breaks. Reasons why a time series (or a relationship between time series) may include structural breaks include:*

- *Changes in the regulatory regime affecting risk. [§2.1]*

*Consideration of the evidence and results derived from the six listed UK [regulated utility] network companies leads to the following findings.*

- *There have been structural breaks in the CAPM beta relationship for most companies since 2000.*
- *Autoregressive conditional heteroscedasticity makes OLS unsuitable when using daily or weekly data for all the companies and remains a problem for half of them even when considering monthly data.*
- *GARCH models can be estimated using daily returns data but there is no one preferred model appropriate for all six companies. [...]*
- *For OLS estimates calculated over different time windows, a relatively small number of observations can influence results for a significant period, especially when the window is quite long – say five years. This means it is important to take a longer view, such as consideration of rolling estimates, and to use high frequency data and longer windows, to ensure that underlying changes are captured rather than noise. [...]*

*The evidence suggests that the process for estimating statistically stable equity betas is problematic [...]*

*There appear to be [various] options available:*

- *Acknowledge the weakness in the current OLS approach and collect a broad range of information [...] and use regulatory judgement to draw a conclusion on the appropriate estimate of the equity beta. [§2.5]*<sup>29</sup>

### **Robertson report (2020)**

As part of Ofgem's Draft Determinations, Ofgem commissioned a further report on beta by Donald Robertson, which reaffirms the same central conclusion about the time-varying nature of beta:

*"The time varying nature of beta should be acknowledged, both in the estimation method and (importantly) in forecasting future betas over the horizon relevant for regulatory control. [...]"*

*The maximum time interval of data should be used consistent with a view that there is no underlying structural shift in the process generating the equity beta." [page 1]*<sup>30</sup>

We also note that Ofgem says that it agrees with the problems associated with using short-term beta estimates, as described in the various beta reports, namely:

*"We remain unconvinced that we should place material weight on short-term equity beta results. Statistically, we believe this is dubious and intuitively we do not think there is materially more information content within short-term (eg 2 to 5-year) beta values compared to long-run values. Our strong view is that the noise to signal ratio is particularly high within short-term results. We also observe a mean-reversion effect within the data - we therefore believe that long runs of data will help us to see through the cycle, avoiding undue bias on high-points or low-points within the short-term date."*<sup>31</sup>

Accordingly, Citizens Advice strongly agrees with the UKRN report, Wright and Robertson report, Robertson reports, and Indepen report that:

- Regulators should take very seriously the implications of lower values of equity betas and asset betas, but we do not believe that Ofwat and Ofgem have done so

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<sup>29</sup> Ofgem Beta Study – RIIO-2: Main Report Final, Indepen, December 2018.

<sup>30</sup> Re-Estimating beta, Donald Robertson, June 2020.

<sup>31</sup> Decision - RIIO-2 Sector Specific Methodology Decision – Finance, para. 3.155.



- Estimation of beta is the one component of the cost of equity where regulators must use their judgement and discretion, including an obligation to examine the evidence as a whole, and we do not believe that Ofwat and Ofgem have done this
- When regulators use an equity beta close to 1, that this has potentially major consequences, implying that the estimation of beta must be critically reviewed
- If regulators wish to estimate the allowable rate of return appropriate to a relatively long horizon, then it is not likely to be appropriate to estimate beta over a short sample period and using high frequency data
- Returns on the market and individual stocks are serially correlated and/or heteroscedastic over time, and therefore that the length of the investment horizon will affect the nature of systematic risk over that horizon
- From first principles, the longer-term non-diversifiable risk in a regulated water company is likely to be close to zero, and therefore the corresponding equity (and debt) betas should also be close to zero.

### **Overall, Ofgem has materially over-estimated water and energy company betas**

Citizens Advice considers that Ofgem has materially over-estimated the level of systematic risk facing the UK regulated energy and water companies, and therefore the betas for the RII0-2 price control review period.

First, we note CEPA's recommendation that asset betas for the regulated energy companies should be in the same range as for the UK regulated water companies:

*"Over the long-term, the empirical evidence of GB water network asset betas are most consistent with a range of around 0.34-0.39. This is supportive of Ofgem's SSMD range of 0.35-0.40 for GB energy networks. [page 5]"<sup>32</sup>*

In the draft determinations, Ofgem is therefore proposing to use an asset beta in the range 0.34 to 0.39 and notional equity beta in the range 0.66 to 0.79, reflecting "[Ofgem's] current judgement that pure-play energy networks hold similar systematic risk to pure-play water networks"<sup>33</sup>.

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<sup>32</sup> RII0-2: Beta estimation issues, Final report for Ofgem, CEPA, July 2020.

<sup>33</sup> Consultation - RII0-2 Draft Determinations – Finance Annex, para. 3.54 and Table 16.

By comparison, Ofwat's PR19 Final Determinations decided on a water company asset beta of 0.36 – and corresponding unlevered equity beta of 0.29, debt beta of 0.125, and notional equity beta of 0.71<sup>34</sup>. Ofwat's Final Determinations are currently subject to appeal at the Competition & Markets Authority (“the CMA”).

In comment to the CMA on the PR19 Final Determinations, Citizens Advice has submitted that it considers that Ofwat has materially overstated the systematic risk faced by investors, and associated betas, in GB water companies<sup>35</sup>. Accordingly, Ofwat's estimates materially overstate the corresponding systematic risk and betas of the energy network companies.

Alongside the CMA PR19 regulatory appeals, the CMA is also currently considering regulatory appeals concerning NATS (En Route) Plc /CAA<sup>36</sup>. We note that in its Provisional Findings report on NATS, the CMA also highlights the general difficulties of measuring regulated company betas<sup>37</sup>.

Second, as described in the CEPA report for Ofgem on beta estimation, systematic risk – and beta – primarily represents business risks associated with the economic cycle. Namely, beta is a measure of the sensitivity of an individual company to the overall economic cycle and/or to other economy-wide economic shocks.

Accordingly, a firm with a positive beta implies a “pro-cyclical” financial risk profile, i.e. that the firm's financial performance is expected to vary positively with the wider economy. In contrast, a firm with a zero beta would imply independence from – i.e. imperviousness to – the economic cycle. Furthermore, a firm with a negative beta would mean a counter-cyclical risk profile, i.e. that varies negatively with the economy<sup>38</sup>.

Hence, energy network firms with asset betas of 0.34-0.39, and notional equity betas of 0.66-0.79 – as proposed by Ofgem – means that the firms' risk profile

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<sup>34</sup> See PR19 final determinations: Aligning risk and return technical appendix, Ofwat

<sup>35</sup> Citizens Advice, [Redetermining water](#), July 2020

<sup>36</sup> NATS (En Route) Plc /CAA Regulatory Appeal: Provisional findings report, Competition & Markets Authority, 2020.

<sup>37</sup> CMA Provisional findings report, §12.57.

<sup>38</sup> For example, bankruptcy/insolvency practitioners.

varies pro-cyclically with the wider economy to a substantial degree. Namely, a 1.00-percentage point increase in the UK economy would imply a 0.34 to 0.39-percentage point increase in energy companies' profit (before interest costs) and 0.66 to 0.79-percentage point increase on average in profit to shareholders.

In Citizens Advice's view, this degree of sensitivity to the wider economy is not plausible. On the contrary, in our view, energy and water companies' financial performance is in general independent of the economic cycle, i.e. not procyclical to any material degree. This is for a combination of reasons, most of which are already identified in detail by Ofwat and Ofgem, namely that:

1. Energy and water are non-cyclical economic sectors, with neither revenues nor costs likely to vary materially, or at all, with the wider economy.
2. The energy and water regulatory regimes substantially protect investors from systematic risk. They also substantially protect investors from most non-systematic risks (also known as "diversifiable" or "idiosyncratic" risk).
3. Both RII0-2 and PR19 add a series of new mechanisms that further protect investors from systematic risk.

### **Energy and water and are non-cyclical economic sectors**

It is widely accepted that energy and water are non-cyclical economic sectors – namely, that they are generally impervious to the wider economy and other economy-wide economic shocks – with neither revenues nor costs likely to vary materially or at all with wider economic cycles.

For comparison, we note the CMA's NERL/CAA Regulatory Appeal Provisional findings report's assessment of non-diversifiable risk of NERL's air traffic control business<sup>39</sup>. In this, the CMA highlights the considerable differences of risk between NERL's business – namely, of volume risk related to air travel demand – and the risk faced by water utilities, of little if any volume risk<sup>40</sup>.

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<sup>39</sup> NATS (En Route) Plc /CAA Regulatory Appeal: Provisional findings report, Competition & Markets Authority, 2020.

<sup>40</sup> CMA Provisional findings report, para. 12.46.

To the extent that energy and water companies (and other utilities) are pro-cyclical, this chiefly comprises bad debt risk, extreme weather risk, and/or political risk, to the degree that such risks impact the regulated companies and the wider economy in the same direction.

However, from the perspective of the typical global investors in the UK energy and water network companies – most of all are which are global banks, global asset management firms, global private equity funds, major pension funds, and/or other institutional investors or multi-national corporations<sup>41</sup> – much or all of such risk should nevertheless be considered as non-systematic risk, as most such risks are local to the UK.

By way of example, the most likely non-diversifiable revenue risk for UK water companies is customer bad debt. For example, Ofwat describes, for the “water resources” and “network plus” price controls, minimal revenue is at risk, *“because the revenue forecasting incentive mechanism allows companies to adjust for over/under recoveries”*, whereas for the retail price controls, the chief (or only) revenue risk associated with these is bad debt, albeit *“which companies are strongly incentivised to manage”*<sup>42</sup>. According to Ofwat, the proportion of water company households recently showing default – i.e. bad debt – is 0.067%<sup>43</sup>. In the event of a dramatic rise of customer default resulting from an economic downturn (such as the COVID-19 pandemic), say by 250% (i.e. an increase of three-and-a-half times), this would still have only a small impact on water company revenues (namely, a reduction of just 0.2%<sup>44</sup>) and profits (a reduction of 1.1%<sup>45</sup>) – and a corresponding small impact on return on capital (a reduction of 0.03 percentage-points<sup>46</sup>) and return on regulatory equity (a reduction of 0.12 percentage-points<sup>47</sup>). If such a downturn corresponded to an economy-wide reduction in corporate profits of 10% or greater, as suggested by various recent

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<sup>41</sup> For example, see Appendix 1 for a list of energy network owners or a list of UK water company owners/parents at [en.wikipedia.org/wiki/United\\_Kingdom\\_water\\_companies](https://en.wikipedia.org/wiki/United_Kingdom_water_companies).

<sup>42</sup> PR19 final determinations: Aligning risk and return technical appendix, page 33-34.

<sup>43</sup> PR19 final determinations: Securing cost efficiency technical appendix, Table A2.3, page 173.

<sup>44</sup> Namely, the water company's bad debt default rate (0.067%) multiplied by 250%.

<sup>45</sup> Namely, the reduction in revenues divided by the share of revenues attributable to capital, of 14.9%, i.e. ratio of projected allowed return on capital revenue to water company wholesale and retail revenues for 2020-25 (source: PR19 final determinations: Company-specific Allowed revenue appendices).

<sup>46</sup> A reduction from projected Ofwat rate of return of 2.96% (CPIH basis) to 2.93%, reflecting that return on capital represents.

<sup>47</sup> A reduction from projected return on regulatory equity of 4.19% (CPIH basis) to 4.07% (assuming 60% notional gearing).

forecasts<sup>48</sup>, this would imply a water company asset beta of at most 0.1<sup>49</sup> and corresponding equity beta of at most 0.3<sup>50</sup>.

In Citizens Advice's view, this example serves to illustrate that Ofwat's and Ofgem's asset beta estimate of 0.36 and equity beta of 0.71 are implausibly high. In Citizen Advice's view, this reflects and confirms the conclusions of the successive studies that beta estimates based on high frequency short-term data will tend to overstate substantially the corresponding underlying systematic risk facing the firms. This is in addition to historic data that overstates the beta for future price control periods with known lower systematic risk.

### **The energy and water regulatory regimes protect investors from systematic risk**

A principal feature of UK economic regulation is that systematic risk is almost entirely borne by customers, rather than by investors. Furthermore, the majority of regulated company non-systematic risk is also borne mainly by customers.

For example, as regulatory economist Professor Dieter Helm has often noted:

*"The overwhelming financial value in most utilities is in the accounting number—the [regulatory capital value]. This is guaranteed by the financing duty on the regulator, so that equity risk lies with customers, not shareholders."*<sup>51</sup>

This contrasts with the standard *"your capital is at risk"* risk warning disclosed to retail equity investors in general.

The CMA NERL Provisional Findings report notes in general that volume risk is itself a function of the way given network companies are regulated<sup>52</sup>.

Furthermore, in its 2015 report on water sector regulation, the National Audit Office found that water companies – and water company lenders – themselves

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<sup>48</sup> For example, "The 90% economy that lockdowns will leave behind", The Economist, 30 April 2020.

<sup>49</sup> The ratio of reduction in water company profits to market-wide profits.

<sup>50</sup> Reflecting notional water company gearing of 60% (omitting the debt beta, which would otherwise reduce the notional equity beta).

<sup>51</sup> Commentary: Special administration, financing functions and utility regulation, Dieter Helm, 2008.

<sup>52</sup> CMA Provisional findings report, para. 12.70.

say that they are positive about the stability and certainty that the UK water regulatory regime provides<sup>53</sup>.

In practice, the chief risk borne by investors in the water companies is ineffective management. This should be entirely within investors' control and responsibility. For example, as Ofgem notes:

*"In our SSMD we set out that the network companies should manage the uncertainty they face and that the regulatory regime should not protect network companies against all forms of uncertainty."*<sup>54</sup>

Correspondingly, Ofwat's PR19 Final Determination describes in much detail how water company investors are afforded considerable risk protections:

- *"Water companies and their investors already benefit from significant risk protection [...] We have added additional uncertainty mechanisms at final determination, which further reduce risk exposure of water companies."*<sup>55</sup>
- *"Companies and their investors in this sector have significant protection from risks compared to companies operating in a wholly competitive environment."*<sup>56</sup>
- *"The revenue risk faced by water companies is low as a result of the reconciliation mechanisms and regulatory protections in place."*<sup>57</sup>

For the water companies, such investor risk protections include<sup>58</sup>:

- **cost sharing incentives** including all water company allowed expenditure (i.e. total expenditure, "totex");
- **inflation indexation** of companies' regulatory capital value and allowed revenues;
- **reconciliation and adjustment mechanisms** that protect investors from changing wage rates, new cost of debt, business rates, abstraction charges, tax rates, and demand volume;

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<sup>53</sup> The economic regulation of the water sector, National Audit Office, 2015, §14.

<sup>54</sup> Consultation - RIIO-2 Draft Determinations - Core Document, Ofgem, July 2020, §7.2.

<sup>55</sup> PR19 Final Determinations: Aligning risk and return technical appendix, Ofwat, December 2019, page 5.

<sup>56</sup> PR19 Final Determinations: Aligning risk and return technical appendix, page 17.

<sup>57</sup> PR19 Final Determinations: Aligning risk and return technical appendix, page 33.

<sup>58</sup> See PR final determinations: Policy summary, Ofwat, 2019, page 27-28, 58; Aligning risk and return technical appendix, page 17, 45; and Putting the sector in balance, page 14-15.

- allowances for **special cost factor claims**;
- **outcome delivery incentives (ODIs)**, which create financial or non-financial incentives for companies to outperform and avoid underperformance;
- **allowed pay-as-you-go (PAYG) adjustments** between PAYG costs and regulatory capital value run-offs, to increase company financial flexibility;
- **customer and developer experience measures**, to create incentives for outperformance;
- **a gearing outperformance sharing mechanism**, which intends to share the benefits of higher gearing with customers; and
- **price-limit reopeners** (also known as interim determinations).

Correspondingly, investors in the energy network companies enjoy similar categories of uncertainty mechanisms, namely:

*“Uncertainty mechanisms (UMs) allow [Ofgem] to adjust a network company’s allowances in response to changing developments during the price control period. Without these, network companies’ allowances could be higher or lower than required. This could result in consumers facing higher costs than necessary or expose network companies to an unreasonable level of risk. [§7.3]*

*There are 4 main types of UMs that we are using in the RIIO-2 price control:*

- **Volume drivers** to adjust allowances in line with actual volumes where the volume of certain types of work that will be required over the price control is uncertain (but where the cost of each unit is stable)
- **Re-opener mechanisms** to decide within the price control period on additional allowances to deliver a project or activity once there is more certainty on the needs case, project scope or quantities, and costs.
- **Pass-through mechanisms** to adjust allowance for costs incurred by the network companies that they have limited control over and that, in general, we consider the full cost should be recoverable eg business rates.
- **Indexation** to adjust allowance for costs that network companies have very limited control over such as general price inflation or interest rates. [§7.4]<sup>59</sup>

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<sup>59</sup> Consultation - RIIO-2 Draft Determinations - Core Document, Ofgem, July 2020.

Ofwat and Ofgem have also previously highlighted that: “[Water and energy] companies’ exposure to unanticipated cost shocks is limited to the extent that there are regulatory mechanisms that can be used to deal with them for example in the water sector the interim determination and substantial effect mechanisms” noting of course that “these mechanisms are not designed to subsidise inefficiency”<sup>60</sup>.

### **RIIO-2 and PR19 add a series of new mechanisms that further protect investors from systematic risk**

Ofgem notes that “Overall, the RIIO-2 price control exhibits lower systematic risk than previous controls, with lower sharing factors and a narrower RoRE range [...than ] RIIO-1 [...providing] greater certainty for investors than previous controls [...including Ofgem’s decision to index the WACC (debt and equity allowances)] to protect both consumers and networks from forecast error”<sup>61</sup> and:

*“The introduction of cost of equity indexation for RIIO2 provides further regulatory protections against financing risk. PR19 has introduced cost of debt indexation for the first time in the sector. [...]*

*The analysis indicates that RIIO2 represents more limited risk across the cost and performance incentives than previous price controls in the energy sector. [§2.2.2]”<sup>62</sup>*

Corresponding, PR19 also adds a series of new uncertainty mechanisms over and above PR14, comprising<sup>63</sup>:

- caps and collars on potentially financially significant performance commitments “to mitigate extreme cashflow and bill volatility”;
- caps and collars to financially material and/or highly uncertain performance commitments;
- the option for companies the option to ask Ofwat to defer excess “delivery incentive adjustments” to a subsequent year;
- reconciliation mechanisms for changes in business rates and abstraction licence charges;

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<sup>60</sup> See for example, Financing Networks: A discussion paper, Ofgem and Ofwat, 2006, para. 71.

<sup>61</sup> Consultation - RIIO-2 Draft Determinations - Core Document, Ofgem, July 2020, §6.11 and §2.15-2.16.

<sup>62</sup> RIIO-2: Beta estimation issues, Final report for Ofgem, CEPA, July 2020.

<sup>63</sup> For example, Aligning risk and return technical appendix, page 83.



- bespoke “*notified items*” for several companies, including at least two of the disputing water companies (Anglian Water and Bristol Water).

### **Ofgem (and Ofwat) should determine materially lower water and energy company betas**

On the basis of the longer-run raw betas estimated in the Wright and Robertson report – of 0.3-0.5 – Ofwat’s asset betas would fall from 0.36 to 0.21-0.30, and notional equity betas from 0.71 to 0.33-0.55<sup>64</sup>.

Accordingly, Citizens Advice considers that **Ofgem should apply an asset beta of at most 0.30**, not 0.34-0.39, and a corresponding notional equity beta of at most 0.55, not 0.66-0.79.

## **1.2 Total Market Returns**

In this section we argue that Ofgem (and Ofwat) have likely under-estimated Total Market Returns (“TMR”). We outline Ofgem’s approach and outline why the TMR should not just be based on the average returns on UK equities and what impact this has on Return on Regulatory Equity (“RoRE”) and TMR. Further, Ofgem should consider adjusting its use of historical market returns as a proxy for current forecast total market returns and take account of actual market forecasts which show that the market is expecting lower returns than Ofgem’s analysis of historical returns. We also assess Ofgem’s use of cross-checks for its cost of equity and find that its approach generates a higher cost of equity than is supported by the source data.

### **Ofgem’s approach**

In Ofgem’s 2018 RIIO-2 Framework Consultation, Ofgem said that it proposed to estimate TMR) “*by considering the historical long-run average of market returns as the best single objective estimate of investors’ expectations of the future*”<sup>65</sup>, taking into account recent decisions by other sector regulators, including Ofwat and the CAA, and the recommendations on the 2018 UKRN cost of capital report.

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<sup>64</sup> Following Ofwat’s and Ofgem’s standard derivation and calculation of asset betas and equity betas from raw betas, leaving other components (observed gearing, notional gearing, and debt betas) unchanged.

<sup>65</sup> Decision - RIIO-2 Sector Specific Methodology Decision – Finance, §3.44.

In Ofgem's following RIIO-2 Framework Decision, Ofgem *"decided to implement our preferred TMR approach – that the best objective measure of TMR is the long-run outturn average, while also placing due weight on forward-looking approaches"*<sup>66</sup>.

At Ofgem's subsequent 2019 Sector Specific Methodology Decision ("SSMD"), Ofgem decided that it *"continued to believe that the UKRN Study provides a robust recommendation that the TMR is between 6% and 7% CPIH real"* and to *"re-present [Ofgem's] TMR range of 6.25% to 6.75% CPIH-real as a working assumption [...], which we believe is conservative in light of the range of reasonable evidence"*<sup>67</sup>.

At Ofgem's 2020 RIIO-2 Draft Determinations, Ofgem notes the cross-sector importance of TMR and that Ofgem had referred the TMR issues identified in the RIIO-2 process to the CMA in the CMA's price determination for NATS En-route Limited (NERL)<sup>68</sup>. Ofgem says that it remains of the view that a TMR range of 6.25% to 6.75% (CPIH-real) is appropriate for RIIO-2 price controls but will consider the CMA's final view alongside stakeholder responses to the draft determinations, before making final determinations for RIIO-2<sup>69</sup>.

In response, Citizens Advice agrees with Ofgem that its proposed TMR range of 6.25%-6.75% (CPIH-real) is conservative and is thereby likely to overstate the true TMR.

As Ofgem notes, Ofgem, the CMA, Ofwat, and other UK regulators endorse the approach recommended in the UKRN cost of capital report that *"regulators should base their estimate of the TMR on long-run historic averages, taking into account both UK and international evidence"*<sup>70</sup>. The recommended UKRN approach is based on *"a methodology in which [the TMR] that is, the expected real return on investments in the equities of a firm with a [beta] of precisely one, should be assumed constant, and set in the light of realised historic real returns in a range of stock markets, over long samples [and that] this methodology is about deriving an estimate of the [TMR, while...] it does not claim to be a precise description of the actual [TMR] (which is of course not directly observable)."*<sup>71</sup>

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<sup>66</sup> Decision - RIIO-2 Sector Specific Methodology Decision – Finance, §3.45.

<sup>67</sup> Decision - RIIO-2 Sector Specific Methodology Decision – Finance, §3.103-3.104.

<sup>68</sup> Consultation - RIIO-2 Draft Determinations – Finance Annex, §3.16.

<sup>69</sup> Consultation - RIIO-2 Draft Determinations – Finance Annex, §3.22-3.23.

<sup>70</sup> Wright, Burns, Mason and Pickford, Estimating the cost of capital for implementation of price controls by UK Regulators, report for UKRN, 2018, page 48.

<sup>71</sup> UKRN cost of capital report, page 36.

## **TMR based on average returns on diversified portfolios**

In Citizens Advice's view, the TMR should not just be based on the average returns on UK equities, but ideally on the average returns on a wider and more diversified portfolio of investments, namely, including bonds, property, infrastructure, private equity, and other such assets that are all readily available to the typical investors in UK energy and water network companies. Such a portfolio is necessarily more diversified than UK listed equities alone, therefore a much better fit for the CAPM's requirement that the "market portfolio" should represent the most diversified (and readily available) portfolio of investments to relevant investors. Such a portfolio is also likely to exhibit lower average returns than equities alone, owing to the inherently geared nature on average of equities.

Correspondingly, estimation of water and energy company betas with respect to UK equities alone is likely to overestimate the relevant systematic risk. This is because the risk associated with UK equities – assumed by definition in the UKRN report as having a beta of 1 – itself represents a diversifiable risk, especially from the perspective of global institutional and corporate investors. Hence, water company betas estimated with respect to UK equities should represent at most an upper bound estimate of the wider market portfolio beta.

As evidence of the long-run average returns on such a wider portfolio of assets, Citizens Advice recommends in particular the widely acclaimed research of Professor Thomas Piketty, who finds that the real "pure return on capital" – a measure based on very long-run directly observable historic averages of return on capital<sup>72</sup> – is currently in the range 3-4%, namely:

*"From the eighteenth century to the twenty-first, the pure return on capital [in Britain, France, the two countries with the most complete historical data] has oscillated around a central value of 4-5 percent a year, or more precisely an interval of 3-6 percent a year. [...] It is possible, however, that the pure return on capital has decreased slightly over the long run: [...] in the early twenty-first century it seems to be approaching 3-4 percent. [...] In any case, this virtual stability of the pure return on capital over the very long run (or more likely this slight decrease of about one-quarter to one-fifth, from 4-5 percent in the*

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<sup>72</sup> Defined as the long-run average real return to capital, comprising the sum of non-financial assets (such as land, property, and other directly owned assets) plus financial assets (such as equities, bonds, savings, pension funds, and other financial investments), less financial liabilities, net of investment management costs.

*eighteenth and nineteenth centuries to 3-4 percent today) is a fact of major importance to this study.”<sup>73</sup>*

Professor Piketty's measure is based on the method of comparing directly observed and recorded national income from capital, with recorded national wealth, to derive the average rate of return on all capital (such as including land and real estate, infrastructure, private equity, and other non-listed assets, rather than just the estimated return on public equity alone)<sup>74</sup>. As above, the CAPM specifies that the relevant “market investment portfolio” should ideally include all available assets (rather than just equities), as such a portfolio will inevitably be more diversified than a portfolio of equities alone. We note in particular that such widely diversified assets portfolios are readily available to the typical investors in UK energy and water companies, who generally include international banks, asset managers, pension funds, and other global corporations<sup>75</sup>.

Adjusting this to the same basis as Ofwat's and the CMA's estimated TMR suggests that Ofgem's TMR of 6.25% to 6.75%, and Ofwat's TMR of 6.50% are too high, and should be closer to 4.0%.

### **Ofgem (and Ofwat) should set materially lower water and energy company allowed returns on equity**

On the basis of the longer-run raw betas estimated in the Wright and Robertson report – of 0.3-0.5 – Ofwat's asset betas would fall from 0.36 to 0.21-0.30, and notional equity betas from 0.71 to 0.33-0.55.

Accordingly, Citizens Advice considers that Ofgem should apply an asset beta of at most 0.30, not 0.34-0.39, and a corresponding notional equity beta of at most 0.55, not 0.66-0.79. This alone would imply a reduction in Ofgem's allowed return on equity to at most 2.87%.

On the basis of the Piketty long-run returns data, Ofgem's allowed return on equity should be lower still.

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<sup>73</sup> See Capital in the 21st century, Thomas Piketty, 2013 (section: The Return on Capital in Historical Perspective).

<sup>74</sup> See <http://piketty.pse.ens.fr/capital21c>.

<sup>75</sup> For example, see Appendix 1 for a list of energy network owners or a list of UK water company owners/parents at [en.wikipedia.org/wiki/United\\_Kingdom\\_water\\_companies](http://en.wikipedia.org/wiki/United_Kingdom_water_companies).

## Use of historical data for estimating TMR

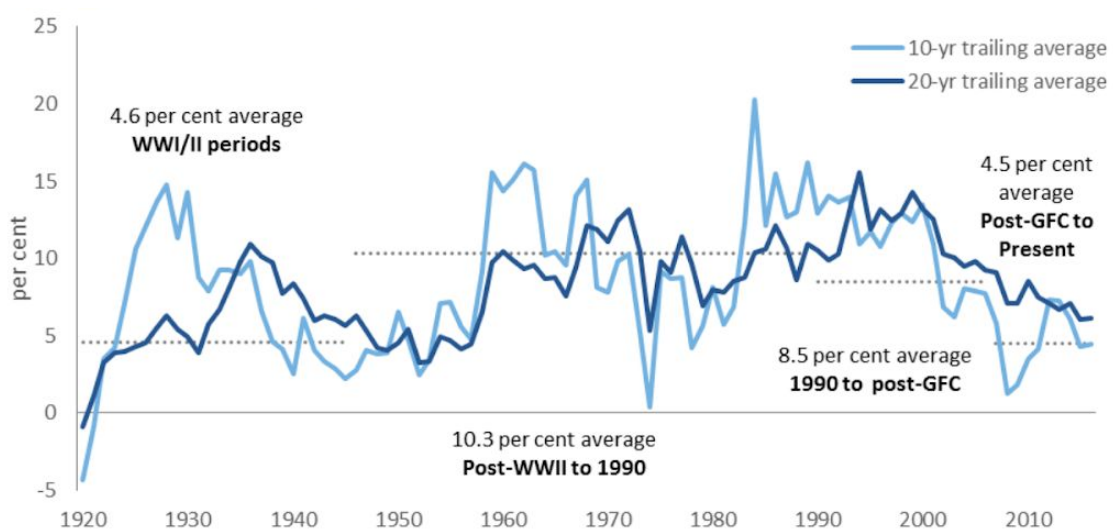
The TMR used in the CAPM framework represents investors' ex ante expectations of market returns. Ofgem (and the CMA) rely primarily on using an 'historical ex post' approach which assumes that historical realised returns provide the best estimate of investors' current expectations.

The huge amount of detailed analysis and arguments around measuring historical TMR for use in price controls of the allowed rate of return provide an unhelpful distraction from a fundamental problem in its use. This is that the conceptual CAPM framework on which the calculation of the allowed rate of return is based requires the TMR to reflect the forecast level of return which investors require in the market today to invest (or the current 'expected' level of return).

The use of historical rates of returns as a proxy for investors' required rates of return is well established in the UK. However, it is critical not to lose sight of the fact that the measure is only a proxy – and if the evidence suggests that it is not a good proxy, then action needs to be taken, particularly if it risks harming consumers.

Since the early 1900s the economy has experienced distinct economic phases, some of considerable duration. This is illustrated in Figure 1 below.

**Figure 1: Historical real equity market returns in the UK**



Source: CEPA<sup>76</sup>

Figure 1 shows that there have been significant variations in the trends of equity returns during different periods. Ignoring these differences in periods of relatively low returns risks is likely to provide shareholders with a higher return than is required or expected by the market.

In our previous submissions to Ofgem we demonstrated that the evidence on actual investor forecasts of TMR indicated materially lower rates of TMR than those obtained from Ofgem's historical ex post analysis.<sup>77</sup>

We do not think that sole reliance on past market conditions is appropriate because it ignores the significance of recent and anticipated market trends. Recently in its provisional findings report on the NATS/CAA appeal, the CMA has set out its case for why it does not consider forward-looking approaches, including surveys of investors and other market participants, to be as robust as statistically historical data. At a simple level that is inevitable – forecasts will inevitably be a less robust data source in terms of variability, but that should not mean they should be dismissed, particularly where, as we demonstrated in our previous submissions to Ofgem, they indicate real market investors making real investment decisions require a lower level of return than that indicated by a proxy for exactly that real world expectation.<sup>78</sup>

It cannot be sensible to set rates of return to be earned by shareholders in 2020 based on returns achieved more than 100 years ago whilst ignoring actual forecasts of market returns made by real investors making decisions today, particularly when that will lead to unnecessary gains to shareholders at the expense of consumers in an obvious breach of the regulator's statutory duties.

## Actual TMR forecasts

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<sup>76</sup> CEPA, report for Ofgem: *Review of Cost of Capital Ranges for Ofgem's RIIO-2 for Onshore Networks*, February 2018, Figure E.3 based on CEPA analysis of Credit Suisse Global Investment Returns Yearbook 2017 <https://www.ofgem.gov.uk/ofgem-publications/130262> Ofgem, *Consultation – RIIO-2 Draft Determinations – Finance Annex*, Table 24, page 64.

<sup>77</sup> Citizens Advice, [submission to Ofgem, Ofgem call for evidence on the Electricity Transmission, Gas Transmission, Gas Distribution and Electricity System Operator Business Plans for RIIO-2](#), February 2020

<sup>78</sup> Citizens Advice, [submission to Ofgem, Ofgem call for evidence on the Electricity Transmission, Gas Transmission, Gas Distribution and Electricity System Operator Business Plans for RIIO-2](#), February 2020

In the draft determinations, Ofgem notes that recent TMR forecasts from investment managers have fallen since its May 2019 SSMD; from 7.65% (nominal) to 7.1% (nominal), a fall of 0.55%.<sup>79</sup> We are disappointed that Ofgem has not reflected this in its TMR assumption.

In its February 2020 report prepared for Citizens Advice, HMK Advisory noted that Ofgem's stated nominal TMR forecasts from investment managers were based on adjusting the published TMRs stated on a geometric average to an arithmetic average:

*"Investment managers' forecasts are stated as geometric averages and, in its analysis, Ofgem adjusted these to an arithmetic average as follows:*

*"we assume an uplift of 1%, which we believe is appropriate based on the JP Morgan publication (which implies a differential between arithmetic and geometric forecasts of 0.82%).*

*Note that this simplification is for demonstration purposes and may not be appropriate for all values"*

*Ofgem do not explain why they apply a higher adjustment than that implied by the JP Morgan data"<sup>80</sup>*

In its draft determinations, Ofgem appears to have made the same simplified 1% adjustment to convert the investment managers TMR forecasts from a geometric mean to an arithmetic mean. For example, Ofgem's analysis includes a TMR forecast of 4.9% (based on an arithmetic mean) for Schroders based on a forecast dated December 2019.<sup>81</sup> Schroders actual forecast is a TMR of 3.9% (on a geometric mean basis).<sup>82</sup> Ofgem therefore appears not to have changed their unnecessarily generous adjustment of 1% and are therefore overstating their investment managers forecasts by 0.18% (i.e. 1% - 0.82%).

On this basis, Ofgem's assessment of the average fund managers' forecast of 7.1% (nominal) should be adjusted to 6.92% (nominal). This is equivalent to 4.8% (CPIH real), using Ofgem's assumption of CPIH (2.02%).<sup>83</sup> This compares to Ofgem's TMR range based on historical returns of 6.25% to 6.75% (CPIH real) – a difference of 1.45% to 1.95%. This is a material difference and indicates that setting an allowed rate of return on TMR assumption based on historical levels of return will be unnecessarily generous to companies.

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<sup>79</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 23.

<sup>80</sup> HMK Advisory Ltd, RIIO-2 Cost of capital, A Report for Citizens Advice, 6 February 2020

<sup>81</sup> Schroders, [10-year return forecasts \(2019-2019\)](#), December 2019, page 6

<sup>82</sup> Schroders, [10-year return forecasts \(2019-2019\)](#), December 2019

<sup>83</sup>  $(1+6.92\%) / (1+2.02\%) - 1 = 4.8\%$

We ask Ofgem to reconsider how it takes into account evidence of actual market expectations into its assessment of TMR and considers making an explicit adjustment to its historical approach where the evidence indicates current expectations are materially below historical averages. We note that Ofgem does take account of current market expectations as part of its cross-checks which we consider in section below.

### Ofgem’s cross-checks indicate a lower WACC is appropriate

In the draft determinations, Ofgem adjusts its CAPM based cost of equity from the mid-point of its range (4.3%) to 4.2% (CPIH real) based on its cross-checks:

*“In our view, cross-checks support CAPM values around 4.2%, which is slightly lower than the mid-point of the Table 16 range. The impact of Step-2, therefore, decreases our estimate of the cost of equity from 4.3% to 4.2% CPIH-real.”<sup>84</sup>*

Ofgem’s cross-checks analysis is shown in Table 1 below.

**Table 3: Ofgem’s Cross-checks**

Cross-check	Nominal	CPIH-real	Source
Modigliani-Miller cost of equity inference (WACC cross-check)	5.3% to 6.2%	3.2% to 4.1%	Real values as per Table 21 for NG, PNN, SVT and UU. Nominal value derived using 2.02% CPIH assumption, for example: $(1+3.2\%) * (1+2.02\%) - 1 = 5.3\%$
MAR-implied cost of equity	$\leq 6.31\%$	$\leq 4.2\%$	Real value implied in paragraphs 3.76 to 3.85. Nominal value derived using 2.02% CPIH assumption. $(1+4.2\%) * (1+2.02\%) - 1 = 6.31\%$
Unadjusted OFTO implied equity IRR	7.00%	4.9%	Nominal value as per Figure 12. CPIH-real derived using 2.02% CPIH assumption. $(1+7.0\%) / (1+2.02\%) - 1 = 4.9\%$
Unadjusted investment managers (TMR) cost of equity	7.10%	5.0%	Nominal value as per Table 23. CPIH-real derived using 2.02% CPIH assumption. $(1+7.10\%) / (1+2.02\%) - 1 = 5.0\%$
Unadjusted infrastructure fund implied equity IRR	6.30%	4.2%	Nominal value as displayed in Figure 13. CPIH-real derived using 2.02% CPIH assumption. $(1+6.30\%) / (1+2.02\%) - 1 = 4.2\%$
CAPM with 0.9 equity beta & investment managers’ TMR	6.44%	4.3%	Real value calculated using risk-free rate of -1.48% and real TMR of 5.0%. Nominal value derived using 2.02% CPIH assumption. $(1+4.3\%) * (1+2.02\%) - 1 = 6.44\%$

Source: Ofgem<sup>85</sup>

<sup>84</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.99

<sup>85</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 24, page 64.



Ofgem does not explain how it uses its range of cross-check data in Table 3 to derive a cross-check for the cost of equity of 4.2%. Our analysis of Ofgem's cross-check suggests a much lower cost of equity is implied by the cross-check data.

### **Modigliani-Miller Cross-check**

The Modigliani-Miller cross-check of 3.2% to 4.1% (CPIH real) would clearly suggest a lower cost of equity than Ofgem's 4.2% (CPIH real).

### **Market to Asset Ratios Cross-check**

Ofgem's analysis of market to asset ratios (MARs) is based on its analysis of water company returns and potential levels of outperformance. Ofgem does not assess cost of equity is implied by a set of reasonable assumptions and the evidence on MARs. Rather it uses MARs data to conclude that a cost of equity of 4.2% represents an upper limit based on 'exceptional assumptions regarding future outperformance:

*"Equity analyst reports indicate potential PR19 outperformance of up to 3% for PNN, SVT and UU, but if we assume the cost of equity is 4.2%, outperformance of approximately 3.7% is needed for 20 years to explain observed premiums. That level of sustained outperformance would be exceptional, and helps justify a view that an allowed return on equity of 4.2% represents an upper limit for the water sector. If we assume that energy and water are of approximately equal risk, given risk benchmarking discussed above (see paragraphs 3.30 to 3.64), the upper limit of 4.2% applies to GB energy networks by extension"<sup>86</sup>*

In fact, rather than exceptional, such a level of outperformance would suggest the efficiency targets in the price control are far too generous. For example, the threshold for Ofgem's proposed return adjustment mechanism designed to protect consumers from "unreasonably high returns" is returns 3% above or below the regulated return on regulatory equity. It cannot be reasonable to calibrate the cross-check data using an assumption which is 'exceptional' or unreasonably generous.<sup>87</sup>

Ofgem's analysis of outperformance, MARs and cost of equity is shown in Table 2 below.

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<sup>86</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.83.

<sup>87</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, page 135.

**Table 4: Ofgem’s Market to Asset Ratios analysis**

Given MAR and expected out-(under-) performance, we infer the true cost of equity as follows...				Given MAR and the true cost of equity, we infer expected out-(under-) performance as follows...			
Out-(under-) performance	MAR = 1.0	MAR = 1.1	MAR = 1.2	True cost of equity	MAR = 1.0	MAR = 1.1	MAR = 1.2
-1.0%	+3.2%	+1.7%	+0.6%	5.20%	+1.0%	+3.0%	+5.1%
-0.5%	+3.7%	+2.1%	+0.9%	4.70%	+0.5%	+2.5%	+4.4%
0.0%	+4.2%	+2.6%	+1.3%	4.20%	0.0%	+1.9%	+3.7%
+0.5%	+4.7%	+3.0%	+1.7%	3.70%	-0.5%	+1.3%	+3.1%
+1.0%	+5.2%	+3.4%	+2.1%	3.20%	-1.0%	+0.7%	+2.4%
+1.5%	+5.7%	+3.9%	+2.5%	2.70%	-1.5%	+0.1%	+1.8%
+2.0%	+6.2%	+4.3%	+2.9%	2.20%	-2.0%	-0.4%	+1.1%

Source: Ofgem<sup>88</sup>

A more realistic approach would suggest the cost of equity should be based on a plausible level of sustained outperformance of, say 0.5%, and a MAR of 1.2, as supported by Ofcom’s data on MARs for network companies based on market value for debt (see Figure 5 and following comments). Ofgem’s analysis (as shown in Table 2) provides a cost of equity for these parameters of 1.7%.

### OFTO IRRs

Whilst the returns required by investors in new OFTO projects provides a useful measure of current investor requirements, the IRRs set by equity investors do not provide a directly comparable benchmark for regulated energy companies, not least because of the differences in gearing and beta assumptions. We recommend that Ofgem undertakes the analysis needed to enable a like-for-like comparison for this potentially useful cross-check to be useful.

### Investment Managers TMR and cost of equity

Ofgem’s unadjusted investment managers’ TMR of 5% is not directly comparable as it ignores any differences in betas. Ofgem takes this into account in final cross-check based on a CAPM calculation using the 5% TMR assumption. This provides an equity cross-check of 4.3% (as per Table 1 above). However, this calculation overstates the cost of equity for 2 reasons. Firstly, as explained above it is based on an unnecessarily generous averaging adjustment. A more

<sup>88</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 22, page 58.

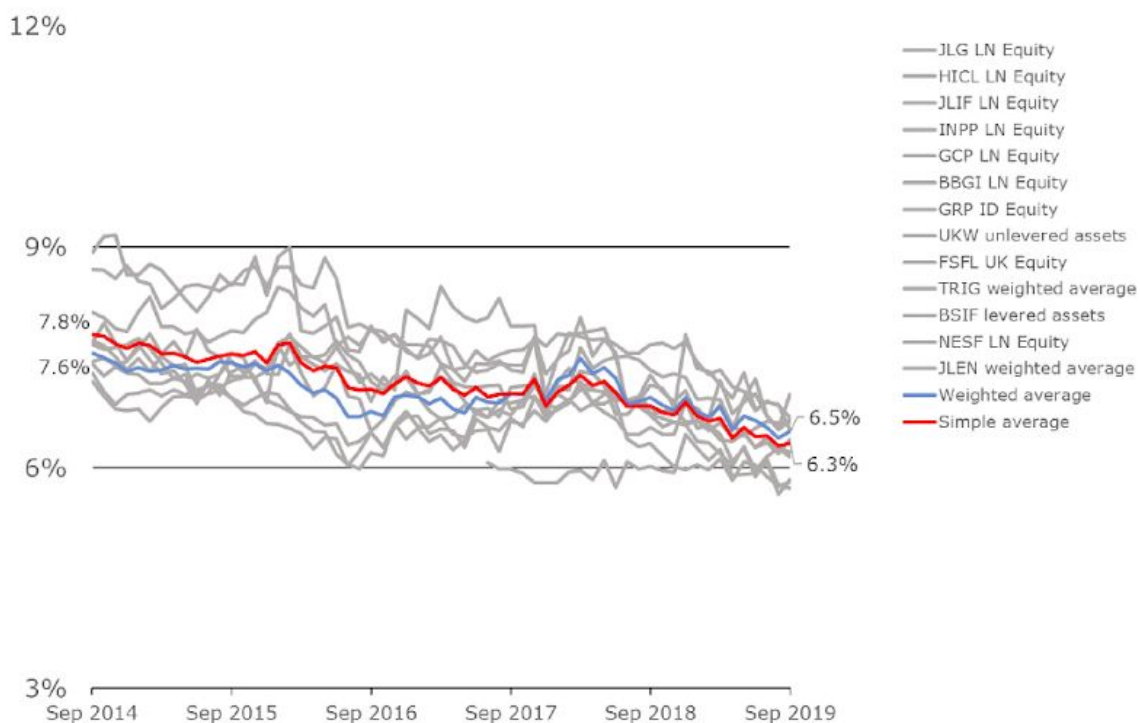
reasonable adjusted TMR (based on an adjustment of 0.82%) is 6.92% (nominal) or 4.8% (CPIH real). Secondly, Ofgem’s calculation of the cost of equity using investment managers’ TMR forecasts assumes a beta of 0.92 whilst its calculation of the cost of equity from historical TMR data is based on a beta assumption of 0.72.<sup>89</sup>

The 2 cost of equity calculations are clearly inconsistent, and the correct approach to obtaining a consistent cross-check is to apply the same beta assumption – i.e. 0.72 for a ‘mid’ value in a cross-check range. The cost of equity implied by the corrected investment managers’ forecast (of 4.8% (CPIH Real)) based on a beta of 0.72 is then 3.19% (CPIH real).

### Infrastructure Funds IRR

Ofgem has used infrastructure funds implied equity IRRs as a cross-check. Its findings are shown in Figure 1 below.

**Figure 1: June 2019 BGGI Infrastructure returns expectations**



Source: Ofgem<sup>90</sup>

Based on the data in Figure 1, Ofgem uses an average IRR of 6.3% in its

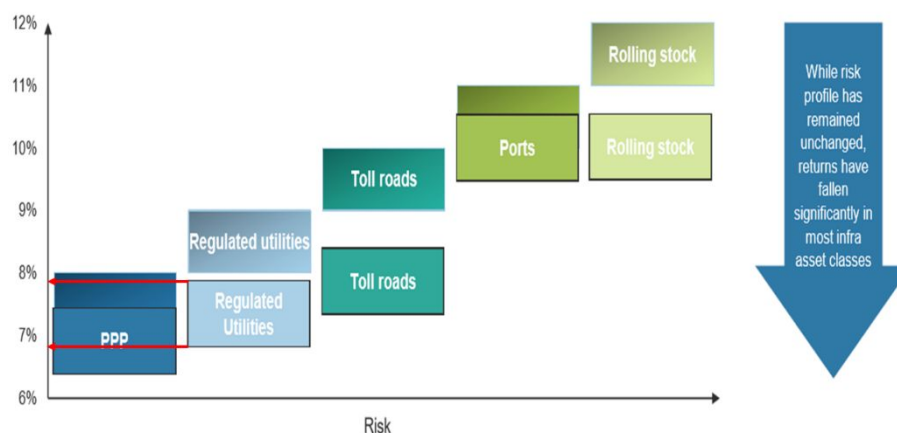
<sup>89</sup> Ofgem, *Consultation – RIIO-2 Draft Determinations – Finance Annex*, Tables 17 and 24.

<sup>90</sup> Ofgem, *Consultation – RIIO-2 Draft Determinations – Finance Annex*, Figure 13 page 63.

assessment of cross-checks<sup>91</sup>.

As outlined in 1.1 on equity beta and in its previous report for Citizens Advice, HMK Advisory noted that in general the required returns from regulated utilities are amongst the lowest of all infrastructure sectors – which would imply a lower than average beta, as illustrated in Figure 2 below.

**Figure 2: June 2019 BGGI Infrastructure returns expectations**



Source: BGGI<sup>92</sup>

Ofgem acknowledges that:

*“We have not attempted to present IRRs on a risk-adjusted basis, and hence acknowledge asset or financial risk could impair comparability among funds and/or direct applicability for RIIO-2.”<sup>93</sup>*

On that basis, it would be reasonable for the cross-check from infrastructure funds to be at the lower end of the range of funds’ IRR reviewed by Ofgem (in Figure 1 above), say 6% (nominal) and not the average (6.3%) which Ofgem has used. An IRR of 6% (nominal) then equates to a comparable cost of equity of 3.9% (CPIH real) assuming CPIH of 2.02%.

A summary of our analysis of Ofgem’s cross-checks, adjusted where appropriate on the basis described above, is shown in Table 5 below.

<sup>91</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 24 page 64.

<sup>92</sup> <https://www.bb-gi.com/media/1845/2019-bbgi-interim-results-presentation-final.pdf>

<sup>93</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.96.

## Cross-Checks conclusion

**Table 5: Citizens Advice Cross-checks analysis**

Cross-check	Ofgem Cross-Check <sup>94</sup> CPIH Real	Citizens Advice Analysis	Reference
Modigliani-Miller cost of equity inference (WACC cross-check)	3.2% - 4.1%	3.2% - 4.1%	0
MAR-implied cost of equity	<= 4.2%	1.7%	1.4.8
Unadjusted OFTO implied equity IRR	4.9%	-	1.4.9
Unadjusted investment managers (TMR) cost of equity	5.0%	-	1.4.10
Unadjusted infrastructure fund implied equity IRR	4.2%	3.9%	1.4.18
CAPM using investment managers' TMR	4.3%	3.19%	1.4.14
Average (excluding unadjusted investment managers TMR)	4.25%	3.11%	

Source: Citizens Advice analysis

As shown in Table 5, our analysis of Ofgem's cross-checks' data after correcting for inconsistencies, unnecessarily generous assumptions and only using directly comparable data sets indicates a cost of equity of 3.1% (CPIH real) compared to Ofgem's assumption of 4.2%. On this basis we request Ofgem looks again at its use of cross-checks and reviews its approach to ensure that:

- **Where appropriate it uses assumptions consistent with its CAPM cost of equity calculations based on historical TMR data**
- **Where cross-checks are not directly comparable because of differences in betas or gearing it considers whether the cross-checks data can be adjusted to ensure cross-checks are comparable**
- **Assumptions used in its calculations are not 'simplified' in a way that distorts the results**

## 1.3 Expected Outperformance Adjustment

In this section we argue why Ofgem should consider the evidence for a larger adjustment to the cost of equity for outperformance. Firstly, we outline Ofgem's

<sup>94</sup> As per Table 3.

approach and suggest a significantly larger adjustment which we argue is objective, transparent and replicable. Secondly, we challenge the need for Ofgem's proposed ex post adjustment.

### **Ofgem's proposed approach**

In the draft determinations, Ofgem proposed to reduce the expected outperformance adjustment to the cost of equity from the 0.5% proposed in the May 2019 SSMD to 0.25%. Ofgem bases its decision on 3 types of analysis (historical totex performance, RIIO-1 performance, MAR analysis) which all indicate actual levels of outperformance will be higher than 0.25% (as Ofgem acknowledges). Ofgem explains that:

*"For the avoidance of doubt, Step 3 [the expected outperformance adjustment] is not designed to entirely or perfectly capture future outperformance. Therefore, investors can still expect to earn returns above the cost of capital, if companies perform well. We have sought to ensure that incentive properties will remain for individual companies and sectors. For these reasons, we do not consider that there is a binary choice between the benefit of incentives and accounting for expected outperformance or information asymmetry."<sup>95</sup>*

In the following sections we explain that a more realistic level of expected outperformance, based on Ofgem's analysis would be 1.6% which would still retain a significant allowance for incentive effects.

### **Expected outperformance based on totex**

Ofgem's first approach is to estimate future outperformance based on historical levels of totex outperformance. Ofgem considers historical levels of totex spend compared to levels assumed in the price control cost models and uses it to assess and calculate an impact on RoRE. It finds that between 2000 and 2020 and a sample of 943 observations, the average level of underspend was 7%.<sup>96</sup> Ofgem then considers how 2 other factors will affect how expected underspend is related to actual performance. Firstly, expected outperformance will be influenced by the incentive effect (i.e. how much of any underspend the company will keep). Secondly, the greater the proportion of total costs represented by totex; the greater will be the impact of underspend on RoRE.

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<sup>95</sup> Ofgem RIIO-2 Sector Specific Methodology Decision – Finance, 24 May 2019, paragraph 3.148.

<sup>96</sup> Ofgem RIIO-2 Sector Specific Methodology Decision – Finance, 24 May 2019, paragraph 3.123.

This is measured by the Totex:RAV ratio. Ofgem’s analysis of expected outperformance based on these factors is shown in Table 4 below.

**Table 6: Ofgem’s analysis of expected outperformance based on totex**

		Incentive strength (company share)				
		30%	35%	40%	45%	50%
Totex:RAV ratio	6%	0.32%	0.37%	0.42%	0.47%	0.53%
	7%	0.37%	0.43%	0.49%	0.55%	0.61%
	8%	0.42%	0.49%	0.56%	0.63%	0.70%
	9%	0.47%	0.55%	0.63%	0.71%	0.79%
	10%	0.53%	0.61%	0.70%	0.79%	0.88%
	11%	0.58%	0.67%	0.77%	0.87%	0.96%
	12%	0.63%	0.74%	0.84%	0.95%	1.05%

Source: Ofgem<sup>97</sup>

Ofgem’s analysis considers that company Totex: RAV ratios range from 6% to 12% as shown in Table 7 below.

**Table 7: Ofgem’s analysis of Totex:RAV ratios**

Sector	Network area	RIIO-1 incentive strength (company share)	RIIO-2 incentive strength (company share)	RIIO-1 Totex/RAV	RIIO-2 Totex/RAV (baseline totex)	RIIO-2 Totex/RAV (Illustrative totex)
GD	East	63.0%	49.6%	10.4%	8.3%	8.7%
	London	63.0%	49.8%	12.8%	9.3%	10.9%
	North West	63.0%	49.5%	10.8%	8.7%	11.1%
	West Midlands	63.0%	49.8%	10.4%	9.2%	10.3%
	Northern	64.0%	49.8%	11.3%	9.9%	10.8%
	Scotland	63.7%	49.5%	10.3%	9.8%	11.8%
	Southern	63.7%	49.5%	10.1%	8.9%	10.3%
	Wales & West	63.2%	49.6%	10.4%	9.3%	11.5%
GT	NGGT	44.4%	36.6%	6.7%	7.4%	8.8%
ET	NGET	46.9%	39.2%	9.8%	5.7%	6.8%
	SHET	50.0%	30.9%	18.7%	8.9%	12.1%
	SPTL	50.0%	39.1%	13.2%	7.7%	11.2%

<sup>97</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 26, page 73.

Source: Ofgem<sup>98</sup>

Ofgem does not explain how the difference between 'baseline' totex and 'Illustrative' totex is used to calculate the Totex:RAV ratios in Table 7, so our assessment is based on the average of both data sets: 9.5%.

It is important that there is an incentives element in a price control, and for the purpose of calibrating this adjustment we assume a 50% 'incentive strength' assumption (i.e. the company's share of underspend, as shown in Table 4) is reasonable, although noting that a much lower assumption could reasonably be used. On that basis, Ofgem's analysis would indicate that its totex analysis would support a minimum expected outperformance adjustment of 0.83%.

As Ofgem itself notes, expected outperformance covers more than just totex (and that evidence from other analysis (such as market to asset ratios - see section 2.5 below), indicates that expected outperformance is much higher than the totex analysis on its own, it would be reasonable to base a minimum expected outperformance adjustment at the average Totex:RAV ratios. This is because there are other sources of expected outperformance. Ofgem explains that totex outperformance is not correlated with non-totex performance and therefore that:

*"We agree with Frontier that expected outperformance is driven, at least in part, by non-totex incentive mechanisms. On this basis Table 26 [expected outperformance as a result of totex underspend, shown as shown as Table 4 above] understates expected outperformance"*<sup>99</sup>

To determine a reasonable level of expected outperformance, it is necessary to take into account other sources of outperformance in addition to totex. In the following section we explain why, based on Ofgem's analysis of RIIO-1 outperformance, it would suggest a reasonable level of expected outperformance on incentives would be 0.6% (See Figure 5 and following comments). A reasonable assumption for the total expected outperformance adjustment based on historical totex outperformance would therefore be 1.53% (i.e. 0.83% for totex plus 0.6% for incentives).

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<sup>98</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 19, page 52.

<sup>99</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Table 26, page 73



## RIIO-1 analysis

Ofgem’s second approach is to assess expected outperformance using RIIO-1 data. To do this, Ofgem has adjusted RIIO-1 returns to make them more comparable with RIIO-2, as shown in Figure 3 below.

**Figure 3: Ofgem’s re-presentation of RIIO-1 RORE**



Source: Ofgem<sup>100</sup>

From Figure 3 Ofgem concludes:

*“This analysis generally supports expected outperformance levels above 0.25% for RIIO-2”<sup>101</sup>*

As in its totex analysis, Ofgem appears to be being generous to the companies. The data does indeed indicate expected outperformance above 0.25%, but the question to be asked is what level of adjustment does the RIIO-1 data support. In our view, Ofgem’s analysis in Figure 3 would support a much higher adjustment than 0.25%.

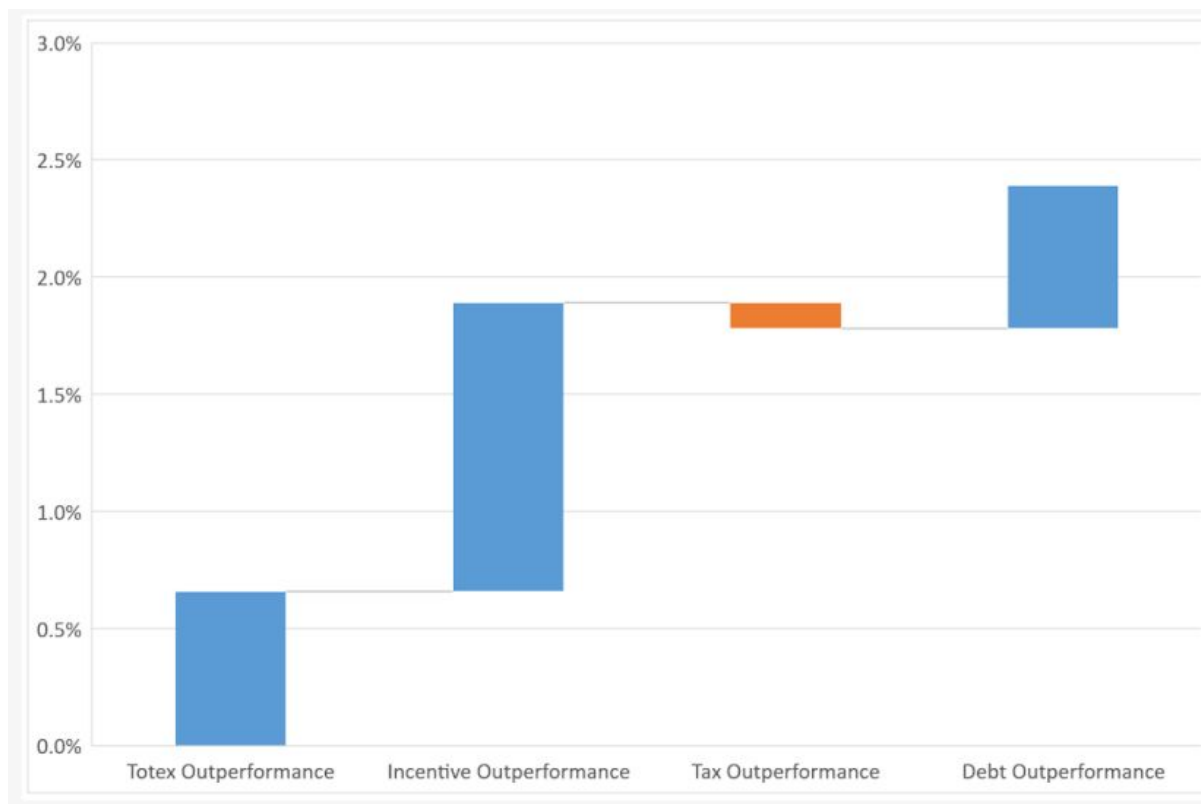
In order to assess a reasonable level of adjustment based on RIIO-1 data, we think it necessary to consider not just totex, but other relevant sources of

<sup>100</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Figure 18, page 75.

<sup>101</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.128.

outperformance. Ofgem's data for all sources of outperformance shown on a weighted average basis is shown in Figure 4 below.

**Figure 4: Ofgem's re-presentation of RIIO-1 RORE data**



Source: Citizens Advice analysis of Ofgem data<sup>102</sup>

We agree with Ofgem that historical levels of tax and debt outperformance are not relevant in this context, but that incentive and totex outperformance incentives are relevant. A reasonable assumption for the level of expected outperformance based on RIIO-1 data would therefore be 1.9% (i.e. 0.7% for totex plus 1.2% for incentives (as shown in Figure 4). Assuming an incentive effect of 50% would therefore imply an expected outperformance adjustment based on RIIO-1 data of 0.95% (i.e. 50% x 1.9%)

### Market to Asset Ratios

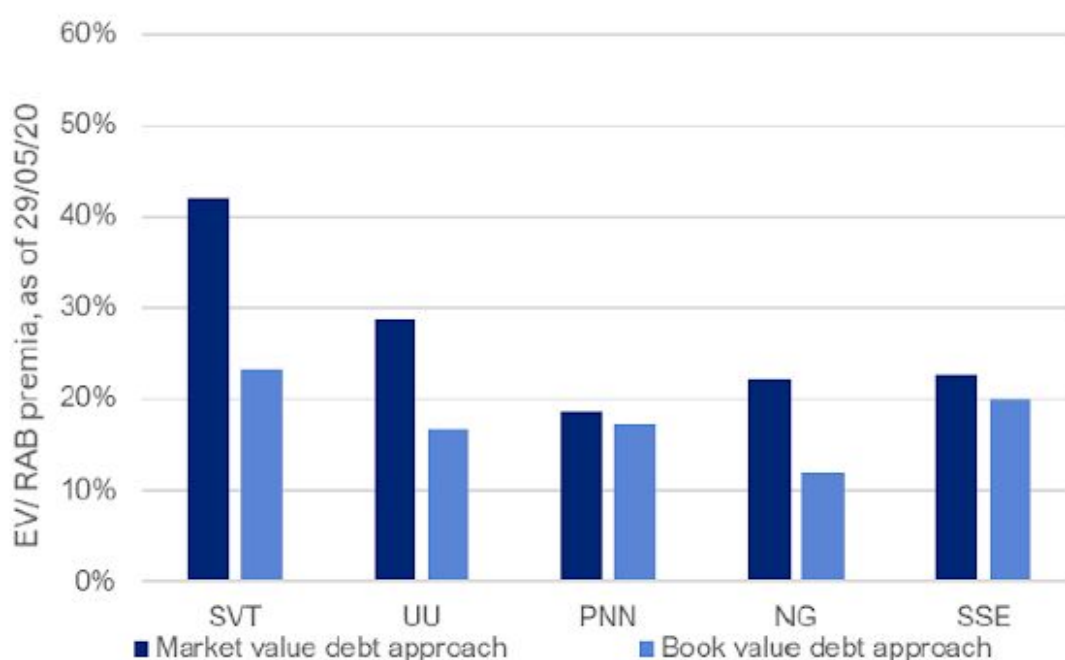
Ofgem's third approach to estimating future outperformance is to use MARs data. Similarly to its use of market to asset ratios to inform cost of equity, Ofgem

<sup>102</sup> Ofgem source data: Draft Determinations technical Annexes Part 1 - Excel file 'Draft Determinations - Residual Outperformance.xlsx'

has used MAR data in considering what level of expected outperformance is revealed by market valuations.

We agree that MARs provide a critical insight into the determination of the cost of capital: unlike much of the CAPM framework which is based on conceptual models and complex statistical analysis of historical market data, MARs provide a direct, observable view of the market’s expectations of future outperformance. Ofgem’s data on MARs for listed companies holding water and energy network assets is shown in Figure 5 below.

**Figure 5: Market to Asset Ratios**



Source: Ofgem<sup>103</sup>

Using the MARs based on market value of debt rather than book value (as that provides a better insight into the corresponding market value of equity), we assume a MAR of 20% (based on the data in Figure 5 above). Using Ofgem’s analysis shown in Table 4 above, a MAR of 20% and Ofgem’s proposed cost of equity of 4.2% would imply an expected level of outperformance (for 20 years) of 3.7%.

As Ofgem itself notes:

<sup>103</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Figure 19, page 78.

*“we believe that expected outperformance of 0.25% is a fraction of the outperformance that is reasonably derived from MAR evidence”<sup>104</sup>*

The question to be asked is then what level of adjustment does the data support? In our view, Ofgem’s outperformance figure of 3.7% (Figure 5 and following comments) is a reasonable place to start. However, some of that overall level of outperformance revealed by the MAR will be due to expected levels of debt and tax outperformance. For the purpose of this analysis we assume the weighted average of tax and debt outperformance (from Ofgem’s adjusted RIIO-1 analysis) of -0.1% and 0.6% respectively (as per Figure 4) to give a total for these two sources of outperformance of 0.5%.

Deducting this from the 3.7% suggests an expected level of outperformance of 3.2%.

### **Summary on evidence of expected outperformance**

All 3 of Ofgem’s approaches to assessing expected outperformance indicates a much higher level than the 0.25% Ofgem propose:

- Totex analysis: 1.53%
- RIIO-1 analysis: 0.95%
- MAR analysis: 3.2%

Of these three, we suggest that more weight is placed on the MAR analysis because, as discussed in relation to MAR, it is based on actual market valuations of future performance.

In considering what level of adjustment to apply to the cost of equity to reflect the level of expected outperformance, we suggest that because this represents a new approach in charge control design, a more cautious approach is justified, but that this should not be taken as a precedent for future years. We therefore suggest that Ofgem applies an adjustment of 50% of the expected outperformance adjustment suggested by MARs (excluding debt and tax) i.e. 50% of 3.2% or 1.6%. This approach has also the benefit of being objective, transparent and replicable in future charge controls and sectors.

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<sup>104</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.138.

## Ex post adjustment

Ofgem is proposing that, at the close-out of RIIO-2, if realised outperformance is less than expected (across 2 groups of gas and electricity licence holders), an additional allowance, up to the original value of expected outperformance is made to the companies. Any outperformance due to the business plan incentive, debt and tax is excluded.

Ofgem argues that the top-up is needed to reinforce stakeholder confidence in the regulatory regime. It explains that if outperformance does not materialise on average then a top-up will increase returns. We disagree with the adjustment for 3 reasons. Firstly, Ofgem presents no evidence to suggest that any reinforcement of the regulatory regime is needed. Market reactions to Ofgem's previous views on the expected outperformance adjustment which did not include the ex post adjustment, clearly show that the market does not need such safeguards as Ofgem seems to think. Rather current company values and the MARs they reveal indicate that investors expect companies to do significantly better than any targets the regulators set. Secondly, an ex post adjustment to "keep shareholders whole" as Ofgem puts it significantly reduces the risks investors face, and if applied should also be reflected in a lower cost of equity than that derived from the CAPM framework. Thirdly, Ofgem does not explain why consumers should bear this risk. Ofgem states:

*"the ex-post mechanism can only increase returns as highlighted in Table 28. This means that the underlying risk of Step 3 is borne by consumers, such that if we are mistaken about information asymmetry, or if (on average) licensees do not beat RIIO-2 targets, equity investors are kept whole."*<sup>105</sup>

*"This analysis generally supports expected outperformance levels above 0.25% for RIIO-2"*<sup>106</sup>

Ofgem is effectively saying: "here is a target which, based on all the evidence, we think is reasonable, but don't worry if you miss the target because we'll increase prices and consumers can pay for it". Such an approach is not reflective of the competitive market which Ofgem is striving to mimic, and risks setting an unnecessary precedent.

## Recommendations

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<sup>105</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.128.

<sup>106</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, paragraph 3.156.

- Our analysis of Ofgem’s data suggest actual levels of expected outperformance by investors of 3.2% are revealed by market to asset ratios. On that basis we suggest a minimum adjustment of half of that amount, reflecting that this is the first use of this improvement to the CAPM based methodology for setting a cost of equity. **We therefore propose an adjustment of 1.6%.**
- This approach has the benefit of being objective, transparent and replicable in future charge controls and sectors
- **We strongly disagree with Ofgem’s proposed ex post adjustment.** It is not necessary and is a one-sided measure for which consumers bear all the down-side risk with no upside. Market reactions to Ofgem’s previous views on the expected outperformance adjustment which did not include the ex post adjustment, clearly show that the market does not need such safeguards as Ofgem seems to think necessary.

## 1.4 Return Adjustment Mechanism (“RAM”)

In this section we argue that companies may generate windfall gains as a result of debt outperformance. Firstly, we outline Ofgem’s approach and argue for inclusion of debt costs in the RAM and that the RAM reduces the riskiness of the regulated companies for investors which should be reflected in a lower equity beta.

### Ofgem’s proposed approach

In the draft determinations Ofgem has proposed a return adjustment mechanism (“RAM”) which will adjust the level of returns due to under/overperformance against total expenditure (“totex”) and outcome delivery incentives (“ODI”).<sup>107</sup> For returns which are 300 basis points either side of the baseline allowed return on equity, the company’s return in regulatory equity (RoRE) will be adjusted by 50% of the return above or below the threshold.

Ofgem state that the purpose and benefits of the RAM are:

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<sup>107</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, Chapter 8.

*“to provide protection to consumers and investors in the event that network company returns are significantly higher or lower than anticipated at the time of setting the price control*

*Consumers and investors will benefit from the introduction of RAMs as they will be protected against the possibility of unreasonably high or low or returns in the RIIO-2 price controls.*

*RAMs to help ensure the fairness of RIIO-2 by protecting consumers and investors against ex post overall returns from network price controls deviating greatly from ex ante expectations.”<sup>108</sup>*

### **Exclusion of debt costs from RAM**

Structuring the RAM around RoRE and limiting it to totex and ODI performance means that the RAM may not provide the level of protection to consumers which Ofgem is trying to achieve. This is because it does not limit actual shareholder returns: the RoRE uses a notional gearing structure rather than the actual gearing of companies and so excludes any outperformance companies earn as a result of raising debt at a lower cost than assumed in the allowed rate of return.

In the SSMD Ofgem explains their rationale for not including debt sharing:

*“We therefore believe it would not be appropriate to share out-or-underperformance of debt costs without also imposing much greater restrictions on capital and corporate structures. This would require standardisation of structures across the sector to create a level playing field in which debt costs could be assessed on a like-for-like basis. This would represent more intrusive regulation and could require changes to legislation and significant restructuring costs.*

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<sup>108</sup> Ofgem, Consultation – RIIO-2 Draft Determinations – Finance Annex, page 135.

*It is also important to recognise that, because of the volume of embedded fixed rate and inflation linked debt in the sector which has long dated maturities, decisions that were made in previous price controls will impact debt performance in RIIO-2. Therefore, any introduction of sharing would risk imposing retrospective sharing of risk for decisions that were made expecting no sharing of this risk and/or return. This would represent a significant departure from our previous stance and, if introduced now, may raise questions over regulatory stability”<sup>109</sup>*

Whilst we strongly support the use of indexation as a basis for setting an efficient level cost of debt, we are concerned that companies may achieve higher returns as a result of outperformance on financing costs which, in a very competitive market, would result in lower prices for consumers. We therefore ask Ofgem to consider amending its upside RAM to include outperformance on financing costs.

### **RAM and Equity Beta**

The RAM changes the risk structure of the companies for shareholders by changing the range of potential outcomes. In principle this can be expected to, at some level at least, reduce the equity beta of the companies. This should be either taken into account explicitly in determining beta or would support the adoption of a beta at the bottom of Ofgem’s range, rather than its current approach of using a mid-point based on market data.

## **Annex 3 Finance Questions**

### **Allowed return on debt**

#### **FQ1 Do you agree with our proposal to use the iBoxx Utilities 10yr+ index rather than the indices used in RIIO-1?**

As in GD and T draft determinations, we support Ofgem’s choice of iBoxx GBP Utilities 10yr+ index.

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<sup>109</sup> Ofgem RIIO-2 Sector Specific Methodology Decision – Finance, 24 May 2019, paragraphs 2.34-2.35.



**FQ2 With reference to paragraph 2.8, do you have a view on what debt allowance calibration should be used for business plan working assumption purposes, and why?**

No response provided.

**FQ3 Do you have any evidence to suggest ED networks should or should not have a debt allowance that has a different calibration to GD&T networks?**

We don't have any evidence that suggests a different calibration.

**FQ4 Do you have any views on our analysis of additional costs of borrowing that may not be captured by an index of bond yields?**

Wide variation in some of the proposed additional costs of borrowing should be narrowed towards the bottom of the broad range given what is known about the non-cyclical characteristics of energy network finance as Citizens Advice outlined in response to 1.1.

**FQ5 Do you agree with our proposal to use the longest term OBR forecast for CPI to deflate nominal index yields to a real CPIH allowance and to switch to using OBR CPIH forecasts if these become available?**

We support this approach as it uses the likely most comprehensive data available to reflect price control costs.

### **Allowed return on equity**

**FQ6 In light of the equity methodology we set out in Draft Determinations for GD&T, do you have a view on how implementation could best be applied to the ED sector?**

Please see response in 1.2

**FQ7 Do you have suggestions on how we could estimate systematic risk for ED2 or any evidence to support a difference between ED and the other RIIO sectors, GD&T?**

Please see response in 1.1. In addition, systematic risk of ED2 companies will be impacted by the overall price control design and if ED2 follows the trend of RIIO-2 draft determinations, then it will further reduce systematic risk. Also, the way in which the energy industry has been able to respond to increased

balancing costs and risks to supplier cashflow during the pandemic is an indicator of the energy systems ability to take extraordinary measures to protect operations. The energy suppliers which are conduits to network revenue were insulated from upfront costs to protect consumers and therefore also networks stability. This further emphasises that investment in energy networks does not put capital at risk in the same way as investments in competitive markets.

There remains very slow growth in competition for network delivery and so systematic risk is incomparable to companies in competitive markets. We would also note the government policies around electric vehicles and electric heat that will increase growth in total electricity demand over ED1 and ED2. It will be a test of an electricity network's strategic investment competency how they respond to increased volatility of generation and demand and access incentives. Conversely, RIIO-2 included gas companies with uncertain volume expectations and perceived risk in the long term value of their assets in RIIO-2, as shown in their depreciation considerations.

The provision of strategic investment and new licence conditions also creates scope for a number of additional deliverables that increase the defined competencies and scope of funded activities. For example, around energy efficiency. The ED2 definition of "responsible long-term guardians of critical infrastructure" increasingly defines a network owner as an operator of a trusted public service, now with a broadly defined licence obligation to be fair to consumers. This means that network risk in certain areas will be increasingly protected or even inversely aligned to market conditions. The more consumers need support and assistance due to financial difficulty, or experience difficulty in engaging with their future energy choices - the more funded and tailored activity from energy networks will be expected to provide fairness.

## **Financeability**

### **FQ8 Do you agree with our proposal to align the RIIO-ED2 financeability approach with the approach we have taken for GD&T?**

We support this proposal.

### **FQ9 Are there any reasons why this approach should differ for RIIO-ED2?**

No response provided.

**FQ10 Do you have a view, supported by evidence, regarding the appropriateness of different measures to address any financeability constraints?**

We do not believe that any further mechanisms are required to address financeability constraints. The combination of options outlined in 4.8 provides a high degree of flexibility to network companies.

**FQ11 Do you have any views on the proposed scenarios to be run for stress testing?**

We don't see a requirement for sector specific stress testing.

**Financial resilience**

**FQ12 Do you agree with our proposal to place additional requirements on licensees in RIIO-ED2 to provide Ofgem with a) published ratings reports, and b) a financial resilience report if their issuer credit rating falls below specified levels?**

We agree with Ofgem that it should be companies and their investors rather than consumers that should bear the risk of a company's choice of its actual capital structure to the extent that it departs from the notional capital structure.

We believe the provision of the proposed reports will assist Ofgem in monitoring the financial resilience of companies and will provide Ofgem with valuable information on networks' considerations of and plans for mitigating financial resilience challenges.

We think this is a highly precautionary measure that it is appropriate for Ofgem to consider, but not one we think reflects increased risk.

**Corporation tax**

**FQ13 Do you agree with our proposal to align the RIIO-ED2 tax approach with RIIO GD&T including; to pursue Option A; the approach to additional protections; the approach to capital allowances; and not to pursue the Fair Tax Mark certification as a requirement for RIIO-2?**

We support Option A and think Ofgem has developed a strong suite of protections. In particular, we support the tax clawback mechanism as it

dis-incentivises licensees to increase their gearing and lower their actual tax costs, while retaining the full tax allowance. This helps share the benefit of interest deductibility with the consumer.

We accept that it is reasonable to allow some time for those companies to adjust to lower levels of gearing for tax clawback purposes.

We welcome Ofgem's proposal for a review mechanism to check company tax allowances. We think an efficient process that would first seek a resolution through engagement with the relevant company is appropriate. However, a formal review should be a backstop if required. We think the proposed introduction of a licence requirement for network companies to submit a board assurance statement alongside the tax reconciliation will be an important additional protection over the appropriateness of the values in the reconciliation.

As previously stated in response to the SSMD and in RIIO-2 draft determinations, we are supportive of the Fair Tax Mark and Ofgem can have more confidence that companies that achieve this accreditation are acting in the interests of consumers. We note that Scottish and Southern Electricity Networks (SSEN) and Electricity North West have achieved this mark on a voluntary basis. We think this is a very positive development and welcome both companies doing this and encourage others to do so.

**FQ14 Are there any reasons why this approach should differ for RIIO-ED2?**

We don't see any reason for a sector specific difference.

**Indexation of the RAV and allowed return**

**FQ15 Do you agree with our proposal to implement CPIH inflation?**

We support the use of CPIH inflation.

**FQ16 Are there any reasons why this approach should differ for RIIO-ED2?**

We don't see any reason for a sector specific difference.

## **Regulatory depreciation**

**FQ17 Do you have any specific views or evidence relating to useful economic lives of ED network assets that may impact the assessment of appropriate depreciation rates?**

No response provided.

**FQ18 During RIIO-ED1, the assumed asset life is being increased. Do you consider another change is required in RIIO-ED2 to reflect the expected economic asset life? If so, do you have supporting evidence and proposals, at this stage?**

No evidence to add here.

## **Capitalisation rate**

**FQ19 Do stakeholders support licensee specific rates for the ED sector?**

We agree with licensee specific rates for capitalisation rates given the different activities that energy networks are required to deliver depending on their locality.

**FQ20 For one or more aggregations of totex, should we update rates ex-post to reflect reported outturn proportions for capex and opex?**

As the impact of the uncertainty mechanism design and scale of investment in ED2 is unknown and could significantly impact efficient capitalisation in the round, we think an ex post assessment would be appropriate.

## **Directly remunerated services**

**FQ21 Are there any reasons why the RIIO-ED2 approach to directly remunerated services should differ from RIIO-ED1?**

We see no reason for a sector specific response.

## Disposal of assets

### **FQ22 Do you support our proposal to continue the RIIO-ED1 approach to disposal of assets for RIIO-ED2?**

We support the continued approach for disposal of assets to be netted off against totex. As a result of changes considered in response to strategic investment incentives we would expect networks to provide more detailed planning to anticipate the trade-offs in the short and long term impacts on consumer benefit.

Given Ofgem's critical assessment of detailed thinking from networks ahead of GD and T draft determinations, we would expect further work to improve input for ED2.

## Dividend policy

### **FQ23 Do you agree that additional reporting on executive pay/remuneration and dividend policies will help to improve the legitimacy and transparency of a company's performance under the price control?**

Ofgem, following Ofwat's example in PR19, has taken a number of measures to require greater openness from networks. For companies that will likely be trusted to deliver the tenets of the GB's response to powering Net Zero it is vital that they have a high level of accountability to consumers.

Consumer trust of network companies and of the vital Net Zero policies that they deliver will shape consumer support and willingness to pay. As a result, greater accountability to Ofgem over tax allowances, disclosure of executive pay and of dividends are very welcome. There are set to be extensive protections for accurate tax allowances in RIIO-2. Networks will also be required to link executive pay to the performance of the regulated businesses, which should incentivise staff performance appropriately. When considering a company's Business Plans these factors are highly relevant because they provide examples of how a company creates a culture of efficiency when working at the expense of captive consumers.

## **Return adjustment mechanism**

**FQ24 Do you agree with our proposal to introduce a symmetrical RAMs mechanism?**

Please see 1.4.

**FQ25 Do you agree with our proposal to introduce a single RAM threshold level of 300 basis points either side of the baseline allowed return on equity?**

Please see 1.4.

**FQ26 Do you have any other comments on our proposals for RAMs in RIIO-ED2?**

Please see 1.4.

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