

National Grid's response to Ofgem's RIIO-2 sector-specific methodology consultation – Finance

Finance overview

An appropriate, balanced financial framework results in current and future consumers being fairly charged for the network they use and the services they receive. Careful assessment and calibration of the framework enables a balance to be struck between consumers benefitting from sustainably low bills and incentivising continued investment which retains flexibility in the network to meet future stakeholder requirements. This balance has always been important but is even more so during the current period of energy transition where networks need to be able to respond to asks which cannot yet be defined, in a way that delivers the most value to consumers.

Stakeholders set out their expectations for networks and the services they want through constructive engagement. The financial framework then needs to support the investment and behaviours required to drive these outcomes. Allowing a return commensurate with the risks borne by networks gives networks sufficient financial capacity and incentive to deliver the innovation and efficiencies which drive service improvement and reduce costs for consumers in the current and future price control periods.

We have profound concerns that the proposed RIIO-2 financial framework does not achieve these outcomes.

The financial framework must be justifiable and estimated using robust processes and assumptions. Ofgem's proposals fail on both counts; they require correction for errors and adjusting to take the full evidence base into account. As such, the proposed framework would not protect the interests of current and future electricity and gas consumers and must be changed as part of this consultation.

We summarise the key points of our response to the Finance annex of Ofgem's Sector Specific Methodology consultation below. Our focus here is on cost of equity, the outperformance wedge, the cashflow floor mechanism and cost of debt allowances. Our detailed responses to the Finance Questions then set out all our views on the framework and proposals for change in detail.

Cost of equity

Setting the right allowed return is critical in ensuring networks are able to fund future infrastructure and have adequate financial capacity to manage uncertainty around the energy transition. Our primary concern with Ofgem's proposals is that the cost of equity value and methodology as they stand give rise to a number of errors:

- **The estimation of underlying CAPM parameters incorporates technical errors.**

At the very least consumers and investors should be able to rely on the estimation of the cost of equity being objective and justifiable, showing continuity from price control to price control and being derived using a transparent process. This is not the case with Ofgem's proposals which contain clear errors.

- **Methodologies introduce arbitrary judgements and depart from regulatory precedent.**

Changes proposed for the RIIO-2 framework have been unpredictable and, in some cases unjustified in nature. Stakeholders expect a price control process to follow regulatory commitment and established principles with clear justification where there is departure from previous approaches. Ofgem has not presented evidence to support such changes creating an unstable regulatory regime. This makes investment in the UK Energy sector less attractive and reduces incentives for networks to invest in the

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appropriate projects. Investors value stability in their future return on investment. Ofgem's framework does not achieve this to the detriment of current and future consumers.

- **The cost of equity range is based on biased filtering of evidence.**

The allowed return value will always be an estimation not an exact calculation which makes it even more important that all available evidence is taken into account to ensure that the estimation is suitably robust. In several areas, Ofgem's proposals exclude sources of evidence against network and third-party recommendations without justification, leading to an unbalanced view of the evidence available.

The combined impact of these errors contributes to Ofgem's proposed working assumption for cost of equity of 3%, RPI-stripped. This value is a full 100 basis points lower than the untested PR19 proposal. As Ofgem shows in the Sector Specific consultation, since the PR19 methodology publication in December 2017, water companies have typically traded below a Market-to-Asset Ratio (MAR) of 1. So, if 4% cost of equity for water companies is not sufficient to generate a MAR of 1 then the 3% arrived at in Ofgem's process cannot be reflective of the higher risk energy sector.

We expand on our key concerns regarding the beta and Total Market Return components of cost of equity as well as Ofgem's methodology use to select a cost of equity point value

Beta

There are three technical errors in the estimation of the beta range for the energy sector:

- Ofgem proposes to de-lever observed equity beta values to estimate an asset beta range for the energy sector. The gearing rate erroneously uses a spot rate of 51% instead of an average gearing rate of at most 45% which results in a substantial understatement of the notional equity beta.
- Ofgem takes the unprecedented and erroneous step of adjusting the observed gearing by an assumed 1.1 value for the Market to Asset Ratio (MAR). This creates a circularity in calculations and an inconsistently low equity return as it breaks the fundamental relationship between gearing and beta. Ofgem should not be targeting a MAR of 1.1. The price control should establish a fair cost of capital. Ofgem should not assume a guaranteed level of outperformance or ignore that the actual MAR is influenced by general market perceptions.

In any case, a uniform adjustment to cost of equity is a flawed approach. Each area of the price control should be individually assessed and calibrated to drive the right behaviours and provide potential for out- and under-performance. Further to this point, Ofgem has already applied a similar arbitrary adjustment in reducing cost of equity by an assumed ex-ante outperformance wedge. We strongly disagree with both of these adjustments as a matter of principle and we disagree further with the application of two such amendments to cost of equity as they are a double count of the same assumption.

- Ofgem has excluded sources of evidence and has not carried out a risk assessment to appraise the results of the beta estimation process. Despite Indepen's recognition that beta decompositions "*may be an important part of the analysis*", Ofgem has not considered disaggregated values in its estimation. This approach has a strong precedent, having for example been used by Ofcom in relation to BT and Openreach.

Furthermore, Ofgem has not included observed beta values for international energy networks as comparators despite them being a better comparator for transmission than UK water companies where beta is lower both in regulatory precedent and observations. Indepen say that significant care should be taken when using international comparators but this is no different to any comparator group.

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Ofgem base their cost of equity working assumption on an asset beta value of 0.35, below the value in the PR19 consultation for the water industry of 0.37. The implication is that energy companies hold less risk than water companies, contrary to regulatory precedent and observed data which show transmission having the highest risk. Ofgem has not carried out a risk assessment to substantiate this premise and there is no evidence to support this assertion. We will continue to invest in more complex, bespoke projects, remain exposed to more uncertainty due to the impact of decarbonisation and are subject to greater cyber risk through greater reliance on digital assets.

When corrections are made for the errors set out above, the energy sector range for asset beta is 0.38 – 0.45, consistent with that proposed in our framework response. The higher risk for transmission and the increase in non-diversifiable political and regulatory risk point to a value in the top end of the range for gas and electricity transmission.

Our responses to FQ12 to FQ15 cover our views on beta in further detail.

Total Market Return (TMR)

Ofgem has put forward its view of TMR which equates to a decrease of ~25% since RIIO-T1 and 20% since the CMA NIE (2014) determination. As with beta, this proposal is underpinned by arguments which contain erroneous assumptions and one-sided reasoning.

The technical errors previously raised in our response to the Framework consultation and which we consider Ofgem has not adequately addressed in the Sector Specific consultation are:

- The CPI index used to deflate nominal TMR to real values is drawn from sources which do not reliably reflect a consumer price index.
- The TMR is weighted towards the geometric mean value rather than the arithmetic mean. This conflicts with accepted academic theory which says that for the investor holding period compared with the long-term data set used to inform TMR estimates, significant weight should be applied to the arithmetic mean.

In addition, there is no justification to exclude international returns data from the comparator set. Our preliminary analysis shows that this data again supports an increase in Ofgem's TMR range, as do shorter term and longer term averages of the historical returns data which have not been considered by Ofgem.

Ofgem compounds these errors by disregarding the upper end of their TMR range through cross-checking to only a limited selection of the evidence available. The lower end of the TMR range is favoured by Ofgem through use of investment consultant evidence which is not directly comparable as it is subject to prudence and has not been adjusted for arithmetic returns. In addition, despite drawing attention to the independent Dividend Growth Models (DGM) from the Bank of England and Bloomberg in our framework response which support the upper end of the TMR range, Ofgem has not included this in their evidence base. Furthermore, although CEPA has updated their DGM, this has not addressed the fundamental criticisms of the input parameters.

Ofgem relies on the line of reasoning that investors reference the prevailing official measure of inflation in forming their view of real returns. On this basis, Ofgem equates CPI-stripped real return to the RPI-stripped value underpinning previous controls. Moody's clearly state that this assumption implies lack of value neutrality on transition from RPI to CPIH; *"Ofgem would use the same 'real' market return regardless of its chosen inflation index. If this is the case, the change from RPI to CPIH is likely to be NPV-negative."*¹

¹ "Regulated gas networks – Great Britain, Credit quality likely to weaken in RIIO-GD2 regulatory period", Moody's Investor Service, 14 February 2019

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In summary, the inflation transition should not be used to justify a decrease in TMR and furthermore, the balance of evidence does not suggest a downwards adjustment to the value of 6.5% (RPI-stripped) determined by the CMA in NIE (2014).

Further detail is set out in our responses to FQ9 to FQ11.

Cost of equity point value

Two risks arise in selecting a point estimate for cost of equity within a range - the value may prove to be either too high or too low. Regulatory best practice is to take account of the likelihood and consequences of making either of these errors. Setting a point value at the upper end of the cost of equity range is justified by recognising that underinvestment arising from setting allowed returns too low leads to more material harm to consumers than the consequences of setting cost of equity too high. The CMA and other regulators have relied on this reasoning on many occasions in the past. Academic research also supports this approach, finding that selection of a value well above the central estimate is likely to minimise the expected losses to society. In contrast to this, Ofgem has deviated from precedent and theory tending towards the low end of ranges for each of the financial components and selecting the mid-point of the range for the cost of equity estimate.

In this context, the water industry provides a powerful reminder of what 'getting it wrong' entails. Following the 1999 water settlement there was a withdrawal of equity from the sector and capex fell in real terms for the period 2000 to 2004 compared to 1995 to 1999. Following PR99, water companies adopted more risk averse operational strategies and subsequently criticised financial engineering was introduced to manage financeability concerns. In addition, there was a sharp reduction in the provision of previously free services, where for example companies stopped providing free water efficiency audits with the potential to create adverse consequences for the environment. Given the proposed package there is a real risk that these consequences could play out again in the energy sector, at a point where there is already significant uncertainty coming from a rapid change in consumer energy needs and political focus.

Ofgem goes further in reducing the point estimate to the lower limit of the proposed range by introduction of a 50 basis points outperformance wedge which is not justified from either a conceptual or a practical basis. From a conceptual perspective, Ofgem is confusing windfall gain from regulators 'getting it wrong- and outperformance from incentives. If Ofgem is adjusting for the first, then regulators are just as likely to set a price control which exposes networks to risk of underperformance as one which gives them windfall gain. If Ofgem is adjusting for the second, then this is a departure from the proven principles and consumer benefit from incentivisation. In this regard, an ex-ante adjustment is to the detriment of consumers due to:

- **Reduced investor confidence and increased investor risk:** the unprecedented and arbitrary adjustment reduces the stability of the regulatory regime and increases investors' required cost of capital.
- **Weaker incentives to deliver efficiencies and innovation:** By calibrating the adjustment to historic performance, Ofgem are effectively applying an ex-post mechanism to clawback performance from previous price controls limiting networks' ability and motivation to deliver such improvements.
- **Distortion of incentives to invest:** The allowed return plus any performance wedge adjustment will need to be factored into investment decisions. This will directly impact operational decisions with a higher hurdle rate discouraging investment.

Practically, Ofgem offers little evidence for the existence or quantum of the 50 basis points reduction. The adjustment is equivalent to an arbitrary 5% to 14% ex-ante totex allowance reduction, applied in a non-uniform way across different networks. Such an arbitrary adjustment could not be justified with so little evidence and neither can the performance wedge, particularly when so many key elements are yet to be finalised. Even when the RIIO-2 price control is

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settled, it should be calibrated to clearly reward networks which perform well and penalise those that do not.

We address these points in detail in our responses to FQ16 to FQ21 covering the cross-checks to cost of equity and expected and allowed returns.

Conclusion

We accept that there is evidence that equity return has reduced from when RIIO-1 was settled. Within our response, we show that rectifying the individual errors Ofgem has made and considering the full suite of evidence results in an allowed equity return of at least 5.5% (relative to RPI) for transmission. The compound extent of the errors, arbitrary adjustments and lack of regard to the full evidence base is demonstrated by the Ofgem range not even capturing our more robust view of the required return.

Cost of debt

The cost of capital is also reliant on setting a cost of debt value appropriate for a notional, efficient company.

We support a methodology which meets Ofgem's policy objectives; that consumers should pay no more than an efficient cost of debt and companies should be incentivised to obtain the lowest cost financing without incurring undue risk. Ofgem's proposal to adopt a full indexation mechanism fulfils these requirements.

However, Ofgem introduces a further error to its proposals by not applying full indexation in practice which is inconsistent with its stated policy. Ofgem's apparent intention is to set an allowance to meet average financing costs across the sector based on actual forecast cost of debt for the price control period. This mechanism effectively passes through the risk attached to the embedded portion of the debt to consumers without taking into account whether it was efficiently incurred. Knowledge that networks bear no risk for the cost of debt raised in previous price controls will not drive the low risk, low cost funding strategy inherent in Ofgem's policy statements. Rather this encourages a short-term strategy for financing costs which will increase costs to consumers. Indeed, Ofgem has already recognised these arguments in discounting pass-through and embedded debt funding mechanisms.

Full indexation should represent efficient notional company costs. All networks operate within the same industry, achieve similar credit ratings and invest in similar assets with comparable asset lives. An appropriate starting point is therefore an industry wide tracker with consistent tenor and rating of the index. A trailing average length of 20 years is consistent with the long-term nature of the assets and is typical of the tenor of debt across the industry, and in that sense, is internally consistent with the iBoxx 10+ index which has been used in RIIO-1, the constituent bonds of which have an average tenor of c.20 years. Such an assumption requires sense checking against actual data. To gain a full picture of industry wide costs, debt re-financing costs should be included in establishing the cost of debt and the tenor and rating to which these costs equate. Exclusion of re-financing costs² does not represent the cost required to achieve lower cost financing in the long-run, producing an asymmetric view which will contribute to networks adopting sub-optimal strategies at a higher cost to consumers overall.

We set out further detail in our responses to FQ1 to FQ4.

Cashflow floor

If cost of equity and cost of debt are set at the correct level, networks should be financeable except in extreme situations such as sustained, material underperformance. Ofgem has

² As proposed by Ofgem through the separate Regulatory Financial Performance Reporting

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proposed a cashflow floor mechanism which advances cash collection from consumers when networks are unable to service their debt. If the cost of debt reflects efficient costs of the notional network and the cost of equity is appropriate for the transmission network, it is unclear in what circumstances the cashflow floor mechanism is expected to be triggered. If an individual network is unable to cover its interest costs due to the outcome of management decisions and actions, it seems inappropriate that consumers are expected to 'bail out the network'. If the cashflow floor mechanism is intended to be triggered as a failsafe for multiple networks, it implies that the cost of capital has not been set in accordance with energy industry requirements. This is inconsistent with Ofgem's duty to have regard to setting a price control at a level which would allow an efficient notional company to finance its licensed activities

Moody's have expressed their concerns that if Ofgem consider there is no longer a need for headroom to financing costs as a result of the cashflow floor, the credit quality of the sector is likely to be weakened.³ This in itself sends a message to equity investors about a changing regulatory framework where Ofgem's proposals to transfer risk from debt to equity holders is actually being incorrectly used to justify depression of equity returns, risking the likelihood of RIIO-2 providing a fair return to shareholders.

The cashflow floor confuses the concepts of liquidity and financeability, cash and returns. The mechanism may well deliver additional cashflow in the short-term but at the expense of value due in the future to investors, to the detriment of long-term financeability. The additional cashflow which could be advanced under the cashflow floor is no compensation for setting a cost of capital which appropriately meets Ofgem's duty to have regard to the need to secure that licence holders are able to finance their licensed activities.

Further detail is included in our responses to FQ24 and FQ25.

Summary

Estimation of cost of capital, and in particular cost of equity, is a complex process. Transparent, accurate calculations are clearly a necessity and established regulatory precedent provides trusted and robust methodologies to guide us to a reasonable value.

Ofgem's current proposals do not meet these basic requirements:

- Technical errors are embedded in the beta and TMR calculations.
- Both beta and TMR introduce calculations which employ arbitrary judgments and depart from precedent.
- Selective reliance and biased assessment of evidence skews the cost of equity to an inappropriately low range.
- The cost of equity point value is unacceptably low due to the erroneous inference that the mid-point of the cost of equity range represents a zero performance position.
- The cost of equity is adjusted for an outperformance wedge which offers a poor substitute for calibrating the price control properly and could cause a wide array of unintended negative consequences.
- Ofgem proposes a cost of debt methodology which does not meet the policy objectives previously specified.
- Ofgem does not properly assess or allocate the risk managed by networks resulting in an insufficient cost of capital for transmission networks.

³ "Credit quality likely to weaken in RIIO-GD2 regulatory period", Moody's Investor service, 14 February 2019

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- The proposals introduce mechanisms as protection for the regulator against setting a cost of capital which is too low.⁴

The immediate consequences of this approach are:

- Ofgem has failed to have regard to balancing their duties to investors and consumers. Investor confidence will be shaken in a regime which is no longer clear, stable or transparent in its approach.
- Network ability to incentivise and innovate is diminished due to reduced financial capacity in cost of capital. Incentives are key to unlocking value which cannot yet be identified or valued and to find innovative ways to deliver the outcomes stakeholders want.

These are primary effects which combine to deliver a package that is to the detriment of current and future consumers, contrary to Ofgem's principal objective.

⁴ "Britain's energy regulator is drawing up plans for a "bailout" scheme for the large monopolies that run Britain's gas and electricity networks, which would see consumers provide "potentially unlimited" money to companies that run into unexpected financial difficulty and could not make debt payments.", extract from the article "Ofgem consults on plan for energy networks 'bailout' scheme", Nathalie Thomas, Financial Times, 25 February 2019

Finance responses

Below are our detailed responses to the questions in the Finance annex of Ofgem's Sector Specific Consultation. Please note throughout our response, cost of capital figures will be quoted on an RPI-stripped basis for comparability to previous price controls unless otherwise stated.

Cost of debt questions

When the overall RIIO Framework was first introduced through the RIIO Decision in 2010⁵, Ofgem made a number of commitments in relation to the approach that would be taken for finance and financeability in future price controls. These included that Ofgem would take a *"longer-term view of financeability, reinforced by regulatory commitment"*. Also, that *"the cost of debt embedded in the allowed return would be a backwards looking determination, based on a long-term trailing average of forward interest rates"* with the index *"based on the real yields of sterling issuers of a similar credit rating to regulated utilities"*.⁶

Thus, the cost of debt allowance would not be set (whether explicitly or implicitly) using actual network debt costs. It would instead be set using evidence of the efficient cost of debt that could be assumed for any notional network company, based on evidence from a much wider sample of companies. The iBoxx indices provide a defensible reference point for an independent, observable cost of debt allowance removing any necessity to rely on company specific data which may not be representative of efficient costs.

Through the RIIO-2 Framework and Sector Specific consultations, there have been some further developments to and clarifications of the proposed approaches, with Ofgem stating that the following principles will be applied in choosing the approach:

- Consumers should pay no more than an efficient cost.
- The cost of debt allowance should be a fair and reasonable estimate of the actual cost of debt likely to be incurred by a notionally geared, efficient network company.
- Network companies should be incentivised to obtain lowest cost financing without incurring undue risk.
- The calculation of the allowance should be simple and transparent while providing adequate protection for consumers.

As noted in our response to the Framework document, we are supportive of these policy objectives. They have a role in incentivising companies to obtain the lowest cost financing without incurring undue risk, which is in the best interests of consumers both present and future. They also build on and are consistent with original 2010 RIIO Decision in relation to cost of debt, so adopting these principles also fulfills Ofgem's earlier commitments.

We support Ofgem's proposal of a full indexation mechanism as the right approach to deliver these objectives. This approach has worked well in RIIO-1 and has delivered benefits for consumers, c.£0.5bn⁷ of savings to date, as allowances have adjusted to changes in market conditions. However, Ofgem's apparent intention is to implement a mechanism which, in practice, would not correspond to full indexation. If the length of the trailing average and potentially the rating were adjusted to fit the cost of debt allowances to the actual costs forecast for the RIIO-2 period, Ofgem would essentially be moving to an embedded debt mechanism with consumers exposed to full cost of debt raised prior to RIIO-2 even where not efficient. This departure from Ofgem's original commitments after just a single round of RIIO price controls,

⁵ "RIIO: A new way to regulate energy networks", Ofgem, October 2010

⁶ *Ibid*, Box 2 page 40

⁷ Savings against Final Proposals base revenues due to movements in the cost of debt allowance, quoted for National Grid networks in outturn prices

would increase market perception of regulatory risk, and so increase financing costs in both the short and longer term, to the detriment of consumers.

We propose and give evidence for a full indexation mechanism which meets the policy objectives, is consistent across the energy industry (electricity and gas, transmission and distribution) and is based on an independent benchmark. We agree that the parameters of the benchmark should be cross-checked using the average tenor of the debt issued across the industry. Also, the credit rating of the iBoxx indices used for the trailing average should be consistent with the results of the financeability assessment carried out for the notional company.

FQ1. Do you support our proposal to retain full indexation as the methodology for setting cost of debt allowances?

We support full indexation across the energy industry which is based on an independent benchmark. We do not support a roll forward of networks' debt across a sector which could be the impact of implementing Ofgem's preferred mechanism.

The cost of debt allowance needs to be set to reflect the cost of debt that would be expected for an efficient, notionally geared network company that follows a typical prudent and efficient debt financing strategy. That is, where the network borrows over time, issuing long-term bonds as it goes along. Thus, in any given year its balance sheet will contain debt issued over many previous years, in addition to the new debt it might issue to finance that year's activities and re-finance of past debt that is maturing.⁸ As Ofgem have previously recognised (para 7.8 in Ofgem's Framework consultation, March 2018), for such a notional company the best approximation for the efficient cost of debt is likely to be a trailing average of market index rates.

Given that companies across all the energy network sectors (gas distribution, gas transmission, electricity distribution and electricity transmission) have issued debt with broadly the same average tenor and all are investing in similarly long-life assets under the same regulatory framework, there is no good reason why debt costs or cost of debt allowances should in the future differ across the sectors⁹:

- The conceptual basis for using a trailing average index applies equally across all sectors. The rationale is that it allows the cost of appropriately rated long-term debt, if raised in equal amounts each year, to be recovered through allowed revenues.
- This profile of debt raising is not intended to be a precise model of the actual debt that has been raised for any individual company, but a plausible model of efficient funding for any network operator.
- There are also no fundamental differences between the sectors that would justify the cost of debt allowances being different.¹⁰ Networks share the same industry, regulatory

⁸ The profile of borrowings that would result from this strategy is not expected to be a perfect representation of actual company debt strategies, and the actual profile of borrowings for individual companies will inevitably depart from this idealised profile for a number of reasons. For example, companies might choose to raise debt less frequently to reduce issuance costs. However, the resulting differences in timings would not be expected systematically or on average to increase or reduce borrowing costs relative to the theoretical /conceptual profile described, so it is not clear why consumers should be exposed to these differences or the risks related to individual companies' decisions.

⁹ Assuming the price controls across the different sectors are being set on a broadly similar basis, with similar notional gearing assumption, and targeting a similar credit rating on a notional basis for each.

¹⁰ Provided notional gearing and other elements of the price control are set for each sector to achieve the same target credit rating on a notional basis (i.e. for the notional company). There are, though, clearly some differences in risk exposure between sectors and companies that need to be taken into account when setting the allowed cost of equity and notional gearing, as was the case in RII0-1 where different companies/sectors had the same cost of debt allowance but different notional gearing and cost of equity.

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frameworks, political risks, financial market, and target credit rating for the notional network company.

A reasonable estimate of the efficiently-incurred costs for a notional efficient network company should therefore be the same in all sectors.

These observations are supported by analysis of the debt instruments that have been issued by different networks. After adjusting for credit ratings, which will reflect corporate capital structure choices, and the tenor of individual debt issuances, the cost of new debt is generally very similar for all network companies. Therefore, after adjusting for these factors, the apparent variations in debt costs between networks and sectors is largely down to when they chose to issue debt.

We do not support Ofgem's apparent proposal to adjust parameters¹¹, such as the length of the trailing average of the iBoxx index and the rating of the reference indices, to back fit actual debt costs, as this would lead to consumers paying for the financing structures that companies have chosen to implement. This would have the substantive effect of making the approach equivalent to either a 'pass-through' (Option C) or partial indexation (Option B), both of which Ofgem have already rejected for good reason. Furthermore, adjusting the parameters to back-fit actual debt costs in this way would cause the approach to fail two of Ofgem's four cost of debt principles for RIIO-2, these being that:

- Consumers should pay no more than an efficient cost of debt, as this principle would be failed for those companies or sectors where the actual cost of debt exceeds the efficient level; and
- The cost of debt allowance should be a fair and reasonable estimate of the actual cost of debt likely to be incurred by a notionally geared, efficient company.

There are also practical difficulties in estimating cost of debt for a notional efficient company based on actual network debt costs (whether on an individual company basis or in aggregate across all the industry). It is difficult to do this in a way that leads to a fair and balanced result which takes proper account of all the main relevant considerations. Such estimates would require the application of a large element of subjective judgment:

- There would be numerous complexities in attempting to make such an assessment. Multiple decisions would need to be made on a case-by-case basis as to whether companies' current actual financing arrangements and past decisions that have led to their current capital structures were efficient or not¹²; and
- Regulatory transparency and scrutiny would become impractical if such estimates rely on commercially confidential corporate and financing information.

Ofgem has recognised these and other drawbacks in paragraphs 2.8 and 2.12 of the Finance annex of the Sector Specific consultation in the context of the partial indexation approach (Option B) and the sharing of debt performance. However, they would also apply to an approach where an assessment of actual network borrowing costs was used to adjust or set the parameters, such as the length of trailing average, using Ofgem's full indexation approach.

At this stage, the focus should be on establishing a principled approach to setting the future cost of debt. This would need to meet the four cost of debt principles that Ofgem have proposed. As explained above, applying a common trailing average index across all the sectors best meets this objective. Once this approach has been agreed, the details of this common approach – such as the length of the trailing average and iBoxx index/credit rating on which it is based – can be

¹¹ RIIO-2 Sector Specific Methodology Annex: Finance, Ofgem, 18 December 2018, para 2.22 to 2.25

¹² 'British Gas Trading Limited v The Gas and Electric Markets Authority: Final Determination', CMA, September 2015, para 8.13 "GEMA stated that its approach was to consider efficiency of debt at the industry level, not to assess the efficiency of individual companies or their debt portfolios" and para 8.15 "GEMA commented that its approach was consistent with the position that financing decisions are for the companies to take, and the regulators role is not to review the efficiency of each debt issuance."

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considered in due course, taking all the relevant evidence into account. In this regard, we note the following:

- Whilst a 10-year trailing average index was originally adopted for RIIO-T1/GD1, Ofgem recognised in RIIO-ED1 that this trailing average would lead to a situation where the cost of efficiently incurred debt would not have been recovered across a range of interest rate scenarios. This led to the adoption of the modified ‘trombone’ index, which extends from a 10-year trailing average to 20 years by 2024/25. In its determination of the BGT Appeal of RIIO-ED1, the CMA then accepted this modified approach and reasoning behind it.¹³
- Companies across all the energy sectors (gas distribution, gas transmission, electricity distribution and electricity transmission) have issued debt with broadly the same average tenor of around 20 years. The average age for existing debt¹⁴ is broadly consistent at around 10 years which leaves an average remaining life of around 10 years. This gives a conceptual basis for the future use of a 20-year trailing average index applying equally across all sectors. This approach would allow the cost of appropriately rated 20-year debt, if raised in equal amounts each year, to be recovered through allowed revenues. In this approach, 20 years is not only broadly consistent with the average length of energy network debt, but also with the average duration of debt that is included in the iBoxx non-financials 10+ index at around 20 years.
- The credit rating of the iBoxx indices used for the trailing average should be consistent with the results of the financeability assessment that is carried out for the notional company. This requirement will need to be addressed in due course, throughout the development of the framework and in networks’ business plan submissions.

Whilst cost of debt allowances should continue to be based on a suitable trailing average of a transparent market index, the actual financing costs of each individual network company will nevertheless almost inevitably depart somewhat from this average, in one direction or the other. Such differences, whether individually or in aggregate, do not however imply that the trailing average index is a poor indicator of the average, efficiently-incurred cost of debt for energy networks. Actual network financing costs depend upon the individual financing decisions that individual companies have taken over many years. These decisions are made in the expectation that networks bear the risks (both upside and downside) that their financing costs may deviate from an objective assessment of the efficient level in successive price controls. We therefore agree with Ofgem’s view (para 6.25 in the Framework Decision) that “*any gains or losses that occur over time against a transparent market-based index*” should not be considered “*windfalls*.”

FQ2. Do you agree with our proposal to not share debt out-or-under performance within each year?

We agree with Ofgem’s proposal not to share debt out- or under-performance. This means adopting a full indexation methodology and excluding financing performance from any Return Adjustment Mechanism. This principle is equally applicable whether performance is considered from a within year or full price control perspective. Options to share performance weaken incentives to create efficiencies and expose consumers to the choices companies make in relation to their corporate structures.

¹³ ‘British Gas Trading Limited v The Gas and Electric Markets Authority: Final Determination’, CMA, September 2015, para 8.22 to 8.43, para 8.38, “We attach more weight to the argument which recognises the challenges with identifying an effective efficiency test at the industry level. It is a common regulatory approach for sector regulators to consider debt costs at an industry level rather than an individual company level. In this light, GEMA’s approach seems broadly consistent with accepted regulatory practice”.

¹⁴ Note that the prevailing interest rate environment at the time debt is issued, so hence how long ago debt was issued i.e. the average age of existing debt, is a key influence on a network’s cost of debt.

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Sharing of debt performance could also result in consumers paying more than an efficient cost of debt in relation to some networks, which would not be consistent with Ofgem's stated cost of debt principles for RIIO-2 and is not justified.¹⁵

Sharing of cost of debt performance would be substantively the same as setting a cost of debt allowance equal to a weighted average of the trailing average index value and actual company debt costs. It therefore suffers from all the drawbacks of the partial indexation approach which we and Ofgem have previously identified and have resulted in Ofgem proposing to reject this approach in the Sector Specific consultation.

As noted above, we agree with Ofgem's view (para 6.25 in the Framework Decision) that "*any gains or losses that occur over time against a transparent market-based index*" should not be considered "*windfalls*." Rather, they relate to the performance of companies as a result of the financing decisions that they have taken and continue to take in order to best manage their financing costs and risks.¹⁶ Networks have taken these decisions in the knowledge that, under both the RPI-X and RIIO price control frameworks, they are exposed to differences between their actual financing costs and the cost of debt allowance. If Ofgem was now to set the future cost of debt allowances based on actual borrowing costs whether directly or indirectly through sharing of under- and outperformance, and whether on an individual company or sector average basis, this would retrospectively change the strength of the incentives that were set in the earlier price controls, with the benefit of hindsight. Such a retrospective revision of the decisions in past price controls is not justified and would not be contemplated in other areas of the price control.

Indirect sharing of debt out- or under-performance by including financing performance in the assessment of company performance that is subject to the Return Adjustment Mechanism (RAM) would also result in consumers paying "*more than an efficient cost of debt*" in relation to some networks, for reasons that most likely relate to particular financing decisions that those networks have taken. It is also relevant that companies have chosen their capital structures and taken specific financing decisions over many years in the expectation that they bear the risks associated with these, so financing cost performance should not be included in the general RAMs. In addition, if financing performance, totex cost performance and incentives performance were to be combined and considered together in a RAM, this could have unwanted and unintended consequences which would be detrimental to consumer and customer interests. The intended incentives on companies to deliver performance in areas that are valued by customers and to discover ways of reducing costs which can then be fully reflected in future price controls could be weakened or even eliminated if 'good' or 'bad' financing performance resulted in the RAM mechanism taking effect.

FQ3. Do you have any views on the next steps outlined in Finance annex paragraphs 2.22 to 2.25 for assessing the appropriateness of expected cost of debt allowances for full indexation?

We broadly agree with Ofgem's next steps for assessing the appropriateness of expected cost of debt allowances but do not support changing the benchmark parameters to match allowances to the actual cost of debt. We also do not agree with a cost of debt allowance being set on a sector basis. The allowance is applicable to the energy industry as a whole.

We summarise the next steps set out by Ofgem in the development of the appropriate cost of debt allowances as:

¹⁵ It's not clear why consumers in these parts of the country or in these sectors should face these higher costs, even if the average across the whole country and all sectors was the same as without sharing of performance: and there would also be no case for an asymmetric mechanism which shared outperformance only and not under-performance, as this would result in a price control mechanism which on average (both across all networks and over time) would fail to fund efficiently incurred costs.

¹⁶ This is consistent with the principle that is applied more generally when designing price controls, which is that risks should be allocated to the party that is best able to manage them.

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- Review of the full indexation mechanism, including changes to the trailing average period and changes to the reference benchmark.
- Assessment of the expected allowances by reference to financing cost, bond yield, debt maturity and new and re-financing data as submitted through the Regulatory Financial Performance Report (RFPR) process
- Assessment of the requirement to adjust the chosen index to reflect the impact of the halo effect, debt issuance costs and company specific circumstances
- Assessment of expected sector debt costs against expected allowances with scenario analysis based on the networks' submitted business plans

Whilst it is important for Ofgem to be mindful of regulatory good practice including principles such as consistency and predictability, we agree that Ofgem should assess whether refinements to the existing indexation mechanisms are justified. We consider each of these proposed next steps below.

Review of the full indexation mechanism, including changes to the trailing average period and changes to the reference benchmark

We support the continued use of the iBoxx 10+ non-financials indices. These indices have the benefit of being based on a large number of bonds from different companies and so are more reliable than other indices which are based on a smaller number of bonds. Ofgem¹⁷ and Ofwat have previously considered different reference indices including those published by Bloomberg, and concluded that the iBoxx indices provide a suitable benchmark that is representative of the networks whereas the other indices have drawbacks. There is no additional evidence or alternative better index to suggest that a move away from the iBoxx non-financials 10+ indices would better represent the debt costs of an efficient notional company.

The rating or ratings of the iBoxx 10+ non-financials index or indices used in calculating the trailing average should be consistent with financeability analysis, and in particular the assessment of the credit rating for the notional company under the proposed price control. This can only be fully assessed once the business plan for a network is available. It may be an average of A and BBB as at present, or it may be more appropriate to use the BBB index only if this rating would be more consistent with the notional network's expected future credit metrics and the other elements of the financeability assessment.

As explained in our response to FQ1, we support the adoption of a common cost of debt index average across all sectors provided the price controls in each sector target the same credit rating for the networks in each sector. This index should be set on a principled basis and can be cross-checked against the average tenor and age¹⁸ of debt across all the sectors together.

Ofgem explained the rationale for the trailing average index approach in the Framework consultation at para 7.8: *"We use a trailing average of the cost of debt revealed by these market indices to set the allowance for the cost of debt for network companies. That means, in most cases for RIIO-1, that the allowed cost of debt in any year is based on an average of market rates over the past decade. We do this because we assume that a notionally geared, efficient network company typically borrows over time, issuing long-term bonds as it goes along. So in*

¹⁷ See for example "Decision on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1 Financial issues", Ofgem, 31 March 2011, paras 3.30 to 3.37

¹⁸ The length of the trailing average would be expected to be broadly consistent both with (i) the average tenor of all networks' debt and (ii) twice the average age of industry's existing debt. For example; if the debt issued by all networks had an average tenor of 20 years and had been issued at a constant rate each year in the past, its average age today would be 10 years as there would be equal amounts of debt issued 20 years ago, 19 years ago, 18 years ago ... 2 years ago and in the past year. Clearly, the cost of debt should then be based on a 20-year trailing average of the index, giving equal weight to the cost of debt issued in each of the 20 years which contribute to the overall portfolio of debt today.

any given year, its balance sheet will contain debt issued over many previous years, in addition to the new debt it might issue to finance that year's activities. Therefore, the best approximation for an efficient company's cost of debt is likely to be a trailing average of market rates." From this rationale, and given that the average tenor of bonds issued by network companies in each sector is around 20 years^{19 20}, it follows that there is a strong *prima facie* case that the same trailing average should be used in each sector, and this should be aligned at a 20-year trailing average rather than a 10-year average as previously used in RIIO-1 for gas distribution, gas transmission and electricity transmission.

Assessment of the expected allowances by reference to financing cost, bond yield, debt maturity and new and re-financing data as submitted through the Regulatory Financial Performance Report (RFPR) process

As explained in our answers to questions FQ1 and FQ2, there are strong reasons not to adopt the partial indexation approach or a sharing of debt under- or outperformance. Ofgem has also already ruled out a 'pass-through' approach because of its drawbacks, including inappropriate incentives and consumers being exposed to actual costs even when higher than the efficient level.

Even so, whilst an individual company's cost of debt will be a consequence of its own past financing decisions, we recognise that the actual financing costs across the whole industry (taking all the gas distribution, gas transmission, electricity distribution and electricity transmission network companies together) could provide an indicative cross-check of the efficiently incurred cost of debt for a typical notional network that is calculated from a trailing index average. This would require all relevant costs, including the cost of early redemption of past debt²¹, to be taken into account in assessing the 'actual' average costs across the industry. Only limited weight should be placed on such a cross-check, given the complexity and judgments involved in the calculations, the adjustments needed and in recognition that networks are responsible for their financing decisions so bear the risks that their cost of debt differs from the efficient level. Even so this cross-check might be used to justify a limited adjustment to 20 years as the length of the trailing average to bring the projected trailing average cost of debt across the RIIO-2 period closer to the projected actual cost of debt across the industry in aggregate.

It should be noted that para 2.25 in the Finance annex suggests that this analysis should be carried out at sector level once business plans have been submitted. However, there are too few companies to do this in most sectors, especially in gas transmission (GT) and electricity transmission (ET) but also in gas distribution (GD) where in each case there is only one company or one company dominates.²² If, in an attempt to get around this problem, it might be considered appropriate and acceptable to combine GT, ET and GD and consider these sectors together, there would then be no reason not to include the electricity distribution (ED) companies in the assessment. Looking across all the sectors together would also avoid the twin problems of (i) a small number of companies in a sector (e.g. ET) having a cost of debt allowance which is

¹⁹ "Consultation on strategy for the next transmission and gas distribution price controls - RIIO-T1 and GD1: Financial issues", Ofgem, December 2010, Figure 3.5

²⁰ "RIIO-ED1: Draft determinations for the slow-track electricity distribution companies Financial Issues", Ofgem, July 2014, para 2.36

²¹ Since the purpose of this analysis is as a cross-check of the estimated efficient cost of debt, it would need to take all such early redemptions into account, whether 'business-as-usual' or related to other specific circumstances.

²² In addition, as noted above, such a sector-specific approach would be inconsistent with the observations that companies across all the energy network sectors (GD, GT, ED and ET) have issued debt with broadly the same average tenor; and there are no fundamental differences between the sectors that would justify the cost of debt allowances being different, given the companies across all four network operator sectors share the same industry, regulatory frameworks, political risks, financial market, and target credit rating for the notional network company.

based almost entirely on the actual cost of debt of a much larger network in its sector, or (ii) a large company having a cost of debt allowance which is influenced by that of a much smaller network which may not be a reasonable comparator.

In addition, a cost of debt allowance based on a sector average would not be consistent with Ofgem's stated cost of debt principles that consumers should pay no more than an efficient cost of debt, and that the cost of debt allowance should be a fair and reasonable estimate of the actual cost of debt likely to be incurred by a notionally geared, efficient company. If the approach was different in different sectors this could lead to substantially different allowances across the sectors with customers and consumers bearing very different costs for use of similar assets and services.

It could, though, be appropriate to use bespoke adjustments to the approach where justified by exceptional circumstances, such as those for SHETL in RIIO-T1 which was projecting more than a three-fold increase in RAV in the eight years of the price control.²³

The need to adjust the chosen index to reflect the impact of the halo effect, debt issuance costs and company specific circumstances

We agree that Ofgem should assess other adjustments which should be applied to the trailing average of the index to better reflect the cost of debt that would be expected to be incurred by a notional efficient network that are not captured by an index of current bond yields.

Ofgem has previously suggested that debt issuance costs do not need to be separately funded, because this is offset by the 'halo effect'. This effect refers to networks being able to issue debt more cheaply than other non-financial corporates with the same credit rating. This result would clearly not apply if cost of debt allowances were based, whether explicitly or implicitly, on actual network borrowing costs either individually or in aggregate. More importantly, the evidence from 2009 onwards has been reviewed both by the CMA and NERA and shows that there is in fact no halo effect once necessary adjustments such as for credit rating are made.^{24, 25} Therefore, consistent with other regulators' approaches and with the general principle of setting an allowance which covers efficiently incurred debt costs, the overall cost of debt allowance derived from the trailing average of the iBoxx index needs to be uplifted. This should allow for debt issuance costs, costs of carry and liquidity provision costs to meet tests for sufficiency of resources, going concern and rating agency requirements.²⁶ We will assess the value associated with these adjustments as part of the business plan submission based on our totex investment plans for the period.

In addition, the regulatory model under RIIO-1 assumes the proportion of RPI linked debt is 25%. However, the cost of debt allowance is based on nominal bond yields and so will not take into account the typically higher cost to issue inflation linked debt. Based on an analysis of utility and infrastructure debt where individual companies have issued both types of debt, the premium to issue RPI linked debt is currently in the mid to high teens of basis points, but has been higher in the past. We expect the premium to issue CPI linked debt for a meaningful amount to be even higher than for RPI linked debt, given the market is even smaller than for RPI linked debt. Therefore, the trailing average of the iBoxx indices needs to be uplifted by at least 5bps to meet the higher cost of inflation linked debt.

Finally, as noted previously, the allowed cost of debt should be set using a trailing average index approach that is common across all sectors, where the length of trailing average, and credit rating for the reference index are set on a 'principles' basis. The chosen index should not generally, therefore, be adjusted to reflect individual company specific circumstances, other than

²³ RIIO-T1: Final Proposals for SP Transmission Ltd and Scottish Hydro Electric Transmission Ltd, Final Decision – Supporting Document, Ofgem, 23 April 2012, Table 5.6

²⁴ 'British Gas Trading Limited v The Gas and Electric Markets Authority: Final Determination', CMA (Sept 2015), paras 8.50, 8.51 and 8.54

²⁵ "Cost of Debt at RIIO-2: A report for ENA", NERA, March 2019

²⁶ *Ibid.*

in extreme exceptional circumstances, such as those for SHETL in RIIO-T1 which was projecting more than a three-fold increase in RAV in the eight years of the price control.

Assessment of expected sector debt costs against expected allowances with scenario analysis based on the networks' submitted business plans

As explained above, an individual company's cost of debt will be a consequence of its own past financing decisions to which consumers should not be exposed. Even if averaged across the companies in a single sector, the results will similarly be strongly dependent on individual network decisions. However, we recognise that actual network financing costs are of interest to the extent that they inform the view of the efficient cost of debt for the notional network. This requires the impact of individual financing decisions taken in the past by particular companies to be minimised, which is best achieved by averaging across the full sample of companies.

Therefore, as explained above, the actual average financing costs across the whole industry (taking all the ED, ET, GD and GT network companies together) could provide an indicative cross-check of the efficiently incurred cost of debt for a typical notional network that is calculated from a trailing index average. Given the strong influence of past financing decisions and existing debt instruments on the overall average future debt costs, particularly in the early years of RIIO-2, the results of this assessment may not be very dependent on the precise details of individual networks' business plans, provided the averaging is carried out across all sectors together. It should though be carried out for a range of future interest rate scenarios.

FQ4. Do you have a preference, or any relevant evidence, regarding the options for deflating the nominal iBoxx as discussed in Finance annex paragraph 2.14? Are there other options that you think we should consider?

We support the deflation of the nominal iBoxx by a measure of expected future CPIH inflation. This removes reliance on use of RPI indices in a CPI-based price control and is also consistent with the mechanism we propose to derive the real risk free rate.

Ofgem currently intends to switch to CPIH indexation for RIIO-2 but to use CPI forecasts as a proxy for expected CPIH because of the absence of any credible independent forecasts for CPIH. As noted in our answer to Question FQ29 below, this will only be reasonable if it can be assumed that on average there will be no differential between CPI and CPIH. In this case, it would be more transparent and would more accurately reflect the substance of the underlying assumptions for indexation to be switched from RPI to CPI, until such time that meaningful, credible and independent forecasts of CPIH are published e.g. by the Office for Budget Responsibility (OBR) or the Bank of England (BoE) and these have established a suitable track record.

Moreover, if the indexation is formally switched to CPIH, but CPI values or forecasts are used in some parts of the price control, any unanticipated differences between CPI and CPIH will have unintended financial consequences which cannot be forecast. There are differences between the values of CPI and CPIH, which in some years have been material (approaching 1%), so CPI should not be used as a proxy for CPIH. This further illustrates why indexation should switch to CPI rather than CPIH until such time that credible, independent forecasts of CPIH have become established.

Whether the switch is made to CPI or CPIH, a new approach will need to be adopted for deflating the nominal iBoxx index. We use the term CPI for the remainder of the response for consistency with the index Ofgem have used in their sector specific consultation.

The move to a CPI-stripped cost of debt allowance and RAV introduces a new risk for our RPI linked debt. Our RPI linked debt was a good match for the RPI stripped cost of debt allowance and RAV, by largely removing inflation risk. As RPI tends to be higher than CPI, our RPI linked debt will grow at a faster rate than a CPI linked RAV (absent any net increases from additions to RAV), with the additional risk that the divergence could be even higher if the difference between

RPI and CPI turns out to be even higher than expected. This mismatch has led to the rating agencies querying how the potential over-leverage would be addressed. The mismatch could also lead to net income after financing costs and certain credit metrics becoming more volatile.

Although there are potential solutions to address this mismatch risk, the market for CPI linked products is small and largely untested for the amounts that we would need to de-risk our RPI linked portfolio. The market for CPIH linked debt and products would be even smaller. Moreover, the removal of the mismatch risk by changing our RPI linked debt to CPI linked debt, synthetically or actually would, to a degree, reduce the cashflow benefit of moving to CPI. As Ofgem has previously expected 25% of our debt to be RPI linked, there should be an additional allowance for the additional risk (as noted in our response to FQ3), or some form of true-up for the actual difference between RPI and CPI for our RPI linked debt.

The current approach for the RPI-based RIIO-1 price controls involves deflating the nominal cost of debt each day (as measured by the nominal iBoxx index) with a corresponding daily measure of expected future RPI inflation (using the gilt breakeven rate), and then calculating a trailing average of the resulting daily values of real rates. For a CPI based RIIO-2 price control, an equivalent approach should be adopted, where daily values of the nominal iBoxx index are deflated directly by suitable measure of expected future CPI inflation. This is preferable to the two-step approach described by Ofgem at para 2.14(i), which continues to use RPI break-even inflation then adjusts for the expected RPI-CPI wedge, as it avoids an unnecessary continuing link to RPI in the mechanism.

This still leaves the question of the basis of the CPI values used deflate the daily values of the nominal iBoxx index. These could be based²⁷ either on the CPI values for the furthest ahead horizon (that is, for five years) in the OBR's Economic and Fiscal Outlook publication which had been published most recently prior to each relevant day, or on the long-term CPI forecast which has in recent years been published in the OBR's Fiscal Stability Report. However, given that both these values have in most cases matched the Bank of England's CPI inflation target of 2%, we propose that it would be simpler to use the 2% target itself²⁸ to deflate daily nominal iBoxx values to calculate the daily cost of debt values on a 'real' basis. From this the relevant trailing average can be calculated to give the annually updated cost of debt allowances. However, at this stage it is difficult to be certain of the relative merits of these alternative estimates of future CPI, and so it may be preferable to decide which values should be used later in the process once the overall approach has been determined.

Risk-free rate questions

FQ5. Do you agree with our proposal to index the cost of equity to the risk-free rate only (the first option presented in the March consultation)?

Yes, we can see merit in the indexation of the risk-free rate (RfR) but the methodology needs to be consistent with a wider robust process for setting cost of equity.

As set out in our response to the Framework consultation, we appreciate that indexation may help ensure consumer legitimacy around cost of equity and can see merit in indexing RfR. This would be consistent with the way in which cost of debt allowances already track with market movements. We agree it is not appropriate to index other cost of equity components. Indexing beta would be undesirable due to the complexity and number of potential judgements involved in estimating its value. TMR indexing is inconsistent with its estimation methodology given the

²⁷ If Ofgem continues to prefer a CPIH based-control rather than CPI-based control for RIIO, the CPIH-values used to deflate the nominal iBoxx index should reflect the expected difference between CPI and CPIH.

²⁸ Though again, this should be adjusted to reflect the expected differential between CPI and CPIH if the price control is linked to CPIH.

weighting attached towards historical averages which results in limited potential for change across the price control period.

In addition, it is key that any interaction with other areas of the framework, most notably the implications for financeability, are given consideration by Ofgem. The proposed package as it stands limits financial capacity to manage exposure to downside risk, which would be exacerbated in a scenario where indexation is used and the RfR declines. Ofgem needs to ensure sufficient financial capacity for networks to protect companies against financeability problems should RfR fall. There also needs to be a clear and transparent assessment of whether the benefit of any expected increase in accuracy justifies the additional complexity, increased credit metric risk and increased bill volatility for consumers.

As Ofgem note in the consultation document (para 3.38 of the Finance annex and from the formula at para 3.46) the sensitivity of the calculated cost of equity to the RfR depends on the beta value, and if a beta is close to 1, the RfR has little effect. As set out in our response to FQ15 we believe Ofgem's working assumptions for equity beta are flawed, and with corrections evidence supports an asset beta range of 0.38 - 0.45 (consistent with that proposed in our Framework response) leading to an equity beta of 0.95 to 1.125 at an assumed 60% notional gearing. Therefore, whilst appropriate in principle there is potential for the allowed cost of equity to remain within a much narrower range during RIIO-2.

This is not a reason for not implementing indexation. It does however, given the enduring nature of the mechanism, reinforce the need to ensure it provides a 'better' answer in all scenarios, whether that be tracking towards an increase or a decrease in allowed cost of equity.

FQ6. Do you agree with using the 20-year real zero-coupon gilt rate (Bank of England database series IUDLRZC) for the risk-free rate?

No, we do not support the use of real gilts rates as a basis for setting the risk-free rate (RfR) as these are not the most objective or stable measure available. We instead support the use of nominal gilts as the basis for calculating the RfR deflated by an appropriate estimate of future CPIH.

In a report commissioned by the ENA, 'Cost of Equity Indexation using RfR', NERA have set out recommendations for three key design aspects of the tracker; appropriate tenor of RfR index, appropriate averaging period and appropriate inflation adjustment to derive a CPIH real RfR.²⁹ We will refer to the findings of this report in our responses to FQ6 and FQ7.

We agree with Ofgem that an important consideration in setting the tenor for RfR will be the stability of the cost of equity under an indexation approach. As set out in our response to FQ5, the stability criterion is key in providing certainty for our investors and limiting potential bill volatility for consumers. Ofgem note in the consultation document (para 3.32 of the Finance annex) that while yields have shown quite significant changes over shorter periods, the variations are reduced with increasing length of gilts. This is consistent with NERA's analysis which shows 20-year nominal gilt yields have been more stable than shorter-term maturities. This is particularly important in the context of events such as the 2008/09 financial crisis, as the relative stability of longer-term market interest rates during periods of anomalous economic activity is useful in smoothing year on year movements to create a more stable profile. The use of long run gilts is also consistent with other UK and European regulators, most recently Ofwat³⁰ who have focused on 10 and 20-year zero coupon nominal gilts given the uncertainty over the average investment horizon for PR19.

For the reasons outlined, we support the use of a longer-term approach but do not agree it is appropriate to use inflation-linked gilts as proposed by Ofgem. NERA's analysis shows that longer term index linked gilts are a less objective measure of RfR given pension fund dynamics

²⁹ "Cost of Equity Indexation using RFR, A report for the ENA", NERA, March 2019

³⁰ Delivering Water 2020: Our methodology for the 2019 price review Appendix 12, Ofwat, December 2017

and the supply/demand imbalance which have worked to keep yields low.³¹ Furthermore, to maintain consistency with the stability argument it is more appropriate to use nominal gilts which have shown less volatility than longer term inflation linked gilt yields.

FQ7. Do you agree with using the October month average of the Bank of England database series IUDLRZC to set the risk-free rate ahead of each financial year?

We do not agree with the use of a single month average to set the RfR. Whilst it may capture the most recent market evidence it ignores interest rate variations over the year which we consider to be more reflective of investor expectations for a full year's investment. We therefore support NERA's conclusion that a 12-month averaging period is more appropriate as it provides more stable estimates of the RfR which minimise the impact of circumstances which maybe particular to that month. It also ensures consistency with approaches already adopted in the framework for both cost of debt and inflation.

FQ8. Do you agree with our proposal to derive CPIH real from RPI-linked gilts by adding an expected RPI-CPIH wedge?

No, we do not agree with the derivation of the CPIH real RfR by application of an expected RPI-CPIH wedge to RPI-linked gilts. Basing RfR on RPI-stripped gilt data would perpetuate use of an RPI index in a CPIH-based price control. We instead support the deflation of nominal gilts by an appropriate estimate of future CPIH.

As the issues surrounding an inflation adjustment to derive a CPIH real RfR are similar to those which need to be considered for cost of debt allowances, this response is consistent with our position outlined in FQ4.

In line with our response to FQ4, given the absence of credible independent forecasts for CPIH and material differences making CPI an inappropriate proxy for CPIH, we support a switch to CPI indexation until such time that meaningful forecasts can be established. On this basis, throughout this response we will refer to options for deflating to CPI real basis.

Ofgem has proposed deriving expected inflation by the addition of a constant wedge to the breakeven inflation that is implicit in the RPI linked gilt market. We have reservations with this approach and its implicit incorporation of a 20-year break even inflation measure. Evaluating the period since 2000, the gilt market is observed to have under-predicted inflation. This was largest during the period of market stress between 2008 and 2010. When only the post 2009 period is considered, the gilt market performed much better as a predictor of headline inflation, thus leading to the inference that breakeven inflation has an embedded liquidity premium element when markets are more prone to be driven by liquidity considerations, rather than to respond to investor expectations of inflation. There is a real risk that in a post Brexit environment, the current approach may once again become a poor measure of inflation.

Our preference therefore is to deduct CPI from a nominal gilt yield to derive a real CPI gilt yield. This is also more consistent with our support of the use of a longer-term nominal gilt and avoids continuing an unnecessary link to RPI in the mechanism. When considering the potential forecasts, we have observed CPI, which over long spans, has closely tracked the BoE's target rate in the period since 2000. A similar picture is drawn when comparing CPIH to OBR's 5-year forecast. The tendency for CPIH to track the BoE's target is intuitive, headline inflation being the Central Bank's main policy objective. However, at this stage it is difficult to assess what the preferred measure should be, so would propose agreeing the basis of forecast when the approach itself is more fully defined.

On this basis, we support deflating nominal gilt yields by the expected CPI rate to derive a real CPI gilt yield. This approach eliminates the need for an ex-ante estimate of the RPI-CPI wedge thus allowing for a simple and transparent way to set an unbiased estimate of the risk-free rate.

³¹ "Cost of Equity Indexation using RFR, A report for the ENA", NERA, March 2019

TMR questions

Ofgem's proposal is for a reduction from 7.25% relative to RPI in RIIO-T1/GD1 to a working assumption range from 5.189% to 5.684% relative to RPI for RIIO-2.³² This represents a decrease of up to 28% in the Total Market Return (TMR) parameter from RIIO-T1 in just five years which is not consistent with our observations of investor expectations. Stepping back from the data and technical information, as the estimates in both RIIO-T1 and for RIIO-2 are based primarily on long-run realised returns, the new proposals do not appear consistent with the principle of a stable TMR.

The proposed TMR values include erroneous assumptions for both the inflation indexation used to derive real returns and the weighting applied between geometric and arithmetic average. Adjusting for the technical errors, taking account of averages over longer or shorter timeframes both in the UK and internationally, and widening the evidence base to include independent sources for Dividend Growth Model (DGM) estimates results in a range of 6.2-7.2% relative to RPI which reflects market expectations of a long term stable TMR.

A large element of Ofgem's proposed reduction in TMR since RIIO-T1 results from the proposed switch from RPI to CPI indexation without any corresponding change being made to the headline TMR rate. Ofgem appear to justify this change (para 3.81) by the introduction of the unsubstantiated argument that investors rely on the prevailing official measure of inflation in forming their view of real returns.³³ On this basis Ofgem equates CPI-stripped real return to the RPI-stripped value underpinning previous controls, but as a result the indexation transition does not maintain the value neutrality which investors would expect. In addition, as explained in our Framework consultation response, the CPI inflation index now being applied in the estimation of the TMR is drawn from sources which do not reliably reflect CPI inflation.

In considering long-run average returns, Ofgem consider only the average values based on a start date of 1900, but there is nothing special about the year 1900 in this context so the effect of choosing a different start date (either earlier or later) for the averaging period should be considered, provided suitable data on equity returns is available. It appears that both earlier and later start dates result in higher long-run averages.

In addition, in deriving the proposed TMR value from historic realised returns, it appears that Ofgem does not apply sufficient weighting to the arithmetic mean value, and the value used is instead skewed too far towards the lower geometric mean. Regulatory precedent is to place greater weighting on the arithmetic mean as this provides a better reflection of the investor holding period compared with the length of period of the dataset. The change in approach has not been properly explained and is not justified.

Similarly, Ofgem does not take into consideration the full suite of independently published Dividend Growth Models when cross-checking the TMR. Exclusion of evidence particularly when referenced in previous price controls skews the allowed return and diminishes transparency and consistency in the methodologies used to set allowed return. Specific concerns were previously raised with the specially commissioned DGM estimates of TMR which Ofgem use instead and, although these DGM estimates have been updated, the changes that have been made do not properly address the failings in the model assumptions that were previously explained.

³² This is equivalent to 6.25% to 6.75% relative to CPI, within the wider range from 6% to 7% in the UKRN report – see Table 13 in the Finance annex to the Sector consultation.

³³ If this proposition was valid, when HM Treasury changed the Bank of England inflation target from an RPI-reference target to a CPI-reference target in 2003, this would have caused a 1% fall in the nominal returns required by investors. Not only is there no evidence for such an overnight fall in required equity returns, but this is implausible.

FQ9. Do you have any views on our assessment of the issues stakeholders raised with us regarding outturn inflation, expected inflation, and the calculation of arithmetic uplift (from geometric returns)?

Long Run Realised Historic Return

Notwithstanding the clarification given to Ofgem by Professor Wright that the TMR range stated in the UKRN report (6% to 7%) was intended to be a real return range relative to CPI, as we previously explained³⁴ this conclusion is dependent on the CPI values that are contained within the Bank of England's Millennium dataset being reliable. However, as explained in NERA's report following a careful review of the data sources used for this CPI dataset, "*the BoE's 'CPI' historical data is unreliable and inconsistent over time*" and so this assumption is unsafe.³⁵ Reliable CPI values only exist for the period since 1989 when the measure was first introduced, and the data does not exist to allow reliable CPI values for earlier timeframes to be calculated.

In contrast, NERA concluded that "*Historical RPI inflation represents the most reliable and consistent source for estimating UK inflation for the period since 1900*", with such RPI datasets being available from both ONS (the so-called 'composite index' defined by the ONS³⁶) and the RPI time-series in the BoE's Millennium Dataset. The same (or a virtually identical) dataset also appeared in 2003 in a House of Commons Research Paper '*Inflation: the value of the pound 1750-2002*', which published "*the best index for long-term price comparisons over the period 1750 to 2002*". This was compiled following discussion between the House of Commons Library, the Bank of England and the Office for National Statistics (ONS). This publication predates any great attention being given to CPI, and from 1947 onwards it uses the official all-items RPI as published by the ONS, so provides further confirmation that the values in the Millennium dataset prior to 1950 can be considered comparable to RPI. An updated version of the Commons Research Paper which brings the inflation series up-to-date was then produced in 2012, using RPI values up to 2011.

It is noteworthy that the deficiencies in the BoE's CPI Millennium dataset that were highlighted by NERA have not been considered or addressed in the Sector Specific consultation. Instead, Ofgem relies on Professor Wright's clarification of the basis of the TMR range in the UKRN paper, which were reached before NERA drew the problems with the historic CPI data to Ofgem's attention.

This may perhaps be supported by a view (see para 3.81 in the Finance annex) that investors rely on the prevailing official measure of inflation in forming their assessment of real returns. As for this latter assertion, not only is it unsubstantiated, but many elements of the economy (including, critically, the very substantial amount of index-linked gilts, but also many private sector pension schemes, interest rates on student loans, pay bargaining, and economic price regulation) still use the RPI either explicitly or implicitly. It would therefore be equally valid to apply the rationale behind this argument to support the view that, even without scrutinising the data sources used in the Millennium dataset and elsewhere, the average 'real' returns based on long-run data should simply be interpreted as being relative to RPI rather than CPI.

Across the full time-window from 1900 to 2016, the geometric average RPI is just 0.2% higher than the geometric average of the (unreliable) CPI values in the BoE Millennium dataset. Taking account of this differential, the 6% to 7% TMR range in the UKRN report, which is largely based on the historical average realised return, could be restated as 5.8% to 6.8% where this range is now a real return relative to RPI.

³⁴ "Review of UKRN recommendations on the appropriate inflation index for estimating historical TMR", NERA, 1 May 2018, attached as Appendix 5 to National Grid's RIIO-2 Framework Methodology consultation response.

³⁵ *Ibid*, page 2

³⁶ Dataset CDKO in the detailed inflation reference tables spreadsheet that is updated and published each month by the ONS

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However, DMS combine a different measure of inflation (a ‘cost of living index’) up to 1947³⁷ with the official RPI values in the following years, presumably because they believe this is a better measure of inflation for these early years, and which is more comparable to the subsequent years’ RPI values than the ONS’s composite series. If these alternative inflation values are used up to 1947 (instead of the composite series), and then the official RPI inflation values are used for subsequent years up to 2016, the implied average RPI inflation from 1900 to 2016 is actually c.0.1% lower than average CPI inflation over the same period using the BoE Millennium dataset, which suggests that the 6% to 7% TMR range in the UKRN report could be restated as 6.1% to 7.1% where this range is a real return relative to RPI.

An alternative approach would be simply to take the DMS average real return from 1900 to 2016 (see the geometric average return of 5.48% shown in Ofgem’s Figure 9). As noted by Ofgem, the most recent versions of the DMS dataset have used CPI inflation values for the years since 1988. However, RPI is still used for the earlier years, and given that CPI has only been used for a relatively small section of the full timeframe (still less than one quarter of the years now covered), the resulting average real returns are best seen as being relative to RPI. In fact, replacing CPI with RPI for the years from 1988 to 2016 would only reduce the average real return across the period from 1900 to 2016 by c.0.2% to c.5.3%. Once the geometric to arithmetic uplift is then made, which has previously been 1% to 2% although Ofgem now propose a slight reduction to this, the resulting TMR range when expressed relative to RPI is again seen to be at least 6% to 7%.

In summary, combining different inflation series with the DMS nominal returns from 1900 to 2016 (from the 2018 Yearbook) gives the following real returns relative to the inflation measure shown:

	Using DMS inflation measure	Using DMS inflation measure to 1988, then RPI	Using RPI series from Millennium databook	Using CPI series from Millennium databook
Geometric average	5.5%	5.3%	5.0%	5.2%
Arithmetic average	7.3%	7.1%	6.7%	7.0%

Many previous price controls have used the DMS dataset as the source of information on long-run average returns, not only because it is a convenient and recognised source, but because it contains carefully researched and consistent equity returns values. For the same reasons, they also used the DMS average ‘real return’ values, which are derived using DMS’s preferred choice of inflation. Ofgem now propose replacing the DMS inflation values with the Millennium dataset CPI values in spite of the reservations expressed within the Millennium dataset itself³⁸, and even though these have been shown to be unreliable for the reasons that NERA have explained. These concerns relate not only to the pre-1950 values (when the same numbers are used for both RPI and CPI in the Millennium dataset), but also from 1950 to 1988 (with an explicit warning given in the source of the CPI numbers for these years). In contrast, the official RPI data are that – i.e. they are official values, that have been published by the ONS and House of Commons library as well as in the BoE’s Millennium databook, and so would be a more sensible inflation series to use if the aim was to replace the DMS inflation values with a consistent, official index.

There are inevitably significant uncertainties and most probably inaccuracies associated with any inflation measure when looking so far into the past, as well as there being substantial

³⁷ “Estimating the cost of capital for implementation of price controls by UK Regulators”, Wright, Burns, Mason and Pickford, page D-120

³⁸ Note that the BoE Millennium dataset explains that caution should be attached to these values, e.g. “It should be noted the data do not represent official Bank of England data or National Statistics”, “users are always advised to consult the original sources as a crosscheck” and “In general the spreadsheet should be viewed as ‘work in progress’ and is intended to be a shared research resource that will evolve and expand over time.”

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changes in consumer lifestyles and spending patterns since 1900, some of which (e.g. the growth of home ownership and resulting expansion in average mortgage costs) are clearly not covered by CPI. Given this, the weight of regulatory precedent, and the reservations regarding the long-run CPI series expressed above, there can be no justification for placing 100% reliance in RIIO-2 on a single value of ‘real’ returns that is calculated using only the Millennium dataset CPI series. A more balanced view would at least place similar weight on the alternative values shown in the table above.

In addition, a willingness to consider evidence from alternative data sources should not be applied selectively but could also be applied in relation to information on equity returns themselves. In particular, there are now sources which give values for equity returns prior to 1900, which seek to overcome the failings in previous price indices for this period, such as ignoring dividends, being effectively unweighted, or based on small samples of stocks. If these sources are combined with the returns from 1900 onwards from DMS, it is found that the long-run realised average real returns are higher than the values based on data from 1900 only. There is no immediately obvious reason to disregard information on the returns from 1825 to 1900 whilst attaching full weight to the returns from 1900 to 1950 when calculating long-run averages, given that this latter 50-year period incorporates two world wars and the great depression of the 1920s/30s, so cannot be seen as being ‘typical’ or representative of expected average returns. Sources for information on nominal returns prior to 1900 are summarised below³⁹, which we have restated in ‘real terms’, together with the corresponding average returns from 1900 onwards from DMS:

Arithmetic averages	Nominal	Real, deflated by Millennium Databook CPI	Real, Deflated by Millennium Databook RPI
DMS / Credit Suisse ⁴⁰ : 1900 – 2016	11.2%	6.97%	6.74%
Grossman 2014 ⁴¹ , 1870 – 1899	7.8%	8.4%	8.0%
Grossman 2014, 1872 – 1913	6.33%	6.2%	6.4%
Acheson et al ⁴² , 1872 – 1913	6.33%		
Turner et al, ⁴³ 1825-1870 (supporting data from Acheson et al, 1825 – 1870)	12.1%	12.4%	12.8%
Turner et al 1825-1870, adjusted for survivorship bias (supporting data from Acheson et al)	10.0%	10.2%	10.7%

This information suggests that if returns prior to 1900 were taken into account, the overall long-run average return would increase. Furthermore, an examination of the DMS data shows that if the start point of the averaging period is brought forward from 1900, the average realised real return also rises. As shown by the chart below (which is based on our own calculations using

³⁹ An alternative data source, from GFD, gives equity returns in the UK back to 1692, but the values this data source gives for the earliest years, until 1800 and for the following 20 years or so, cannot really be considered representative, because of the very small number of stocks included by GFD during these years, and also because the GFD data includes (and is most likely dominated by during these years) the Bank of England and East India company: as noted in the ‘Rule Britannia ...’ paper, these were closely linked to the UK Government and might be seen as more like government debt than equity. The Acheson, Hickson, Turner and Ye data sources we have used seek to overcome these problems and do not include the Bank of England and East India Company.

⁴⁰ Analysis of investment returns since 1900 in ‘Credit Suisse Global Investment Returns Yearbook 2018’, Elroy Dimson, Paul Marsh and Mike Staunton, published by Credit Suisse Research Institute

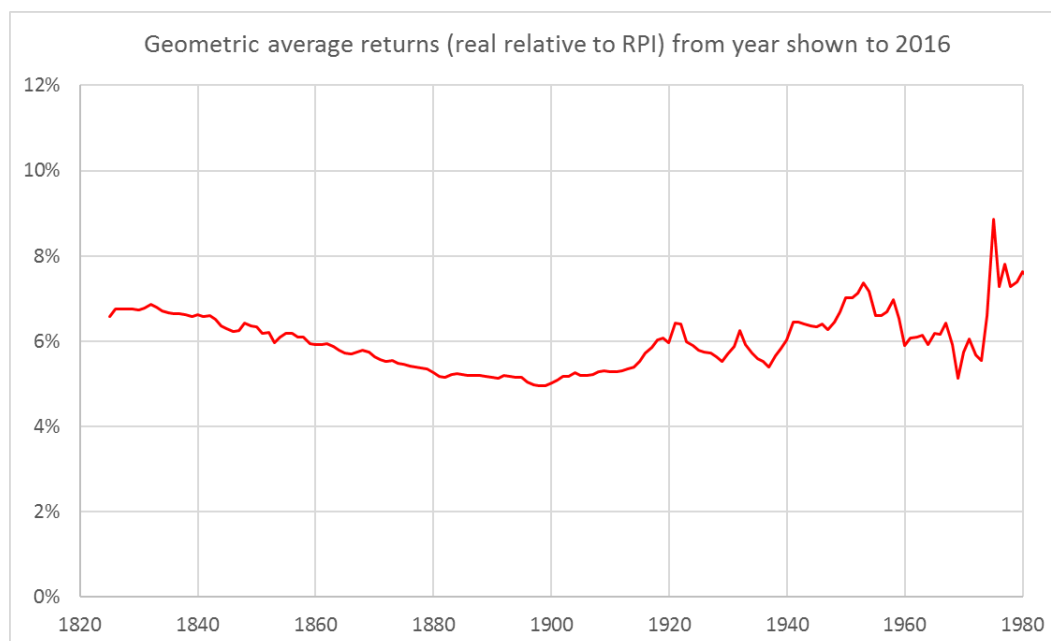
⁴¹ “Bloody Foreigners! Overseas Equity on the London Stock Exchange, 1869 to 1928”, Richard S Grossman, January 2014, Wesleyan University Connecticut

⁴² “Rule Britannia! British Stock Market Returns 1825-1870”, Acheson, Hickson, Turner and Ye, 2009

⁴³ “Has equity always earned a premium? Evidence from nineteenth-century Britain”, Turner, Acheson, Hickson and Ye, May 2008

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the above data), it appears that 1900 is at, or very close to, the minimum point, such that choosing either an earlier or later date as the starting point for the calculation of long-run realised average (real) returns on UK equities leads to higher values.



Clearly, there is nothing special about using 1900 as a start point, so the data presented above suggests that the long-run average should actually be somewhat higher than a figure based on averages from 1900 alone. Across the full timeframe, the data appears to support a geometric average real return (whether relative to RPI or CPI values from the Millennium dataset) of over 6.5% (even after adjusting the 1825-1870 figures for survivorship bias as per Turner et al 2008).

These values are derived using the long-run series of RPI and CPI from the Millennium dataset, notwithstanding the limitations of these values explained above, especially for the CPI values. However, this is not a justification for completely ignoring the returns data from 1825 to 1900, if the CPI values from 1900 to 1950 are considered suitable for use in the same way. Rather, if Ofgem wished to calculate a long-run average using robust inflation and return data only, this would need to be based on the period from 1950 onwards (still covering 66 years), for which more fully documented inflation data exists. The following table summarises the results when averaged across different timescales

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	1825 to 2016	1870 to 2016	1900 to 2016	1950 to 2016
Length of averaging period (years)	192 years	146 years	117 years	67 years
Geometric average nominal returns	9.2%	9.1%	9.4%	12.7%
Ofgem approach: converting nominal returns to real using the CPI dataset from Millennium databook (notwithstanding the limitations of these values, which may better represent RPI prior to 1950)				
Geometric average relative to Millennium databook CPI series	6.7%	5.9%	5.23%	7.48%
Uplift assumed by Ofgem (from geometric towards arithmetic average)	0.77 to 1.77%	0.77 to 1.77%	0.77 to 1.77%	0.77 to 1.77%
Implied TMR range relative to CPI	7.5% to 8.5%	6.7% to 7.7%	6% to 7%	8.25% to 9.25%
Ofgem's Assumed future RPI-CPI wedge	1%	1%	1%	1%
Implied TMR range relative to RPI	6.5% to 7.5%	5.7% to 6.7%	5% to 6%	7.25% to 8.25%
More robust approach: converting nominal returns to real using RPI values published as a consistent dataset by ONS and the House of Commons research paper as well as in the BoE Millennium dataset				
Geometric average relative to Millennium databook RPI series	6.6%	5.6%	5.01%	7.02%
Uplift assumed by Ofgem (from geometric towards arithmetic average)	0.77 to 1.77%	0.77 to 1.77%	0.77 to 1.77%	0.77 to 1.77%
Implied TMR range relative to RPI	7.4% to 8.4%	6.4% to 7.4%	5.8% to 6.8%	7.8% to 8.8%

Notes:

1. Ofgem's/UKRN's range and the basis on which it was estimated is highlighted in yellow above.
2. Whether the reduction in this uplift from the previously used range/value (up to 2%) is justified is considered below

In conclusion, considering UK data for different time periods, the only basis on which a long-run real average of less than 5.7% to 6.7% (relative to RPI) would be calculated involves firstly choosing a timeframe from around 1900, which gives the lowest long-run averages; and then combining these with the CPI values from the Millennium dataset (which are only actually CPI values from 1988 onwards and in earlier years, especially prior to 1950, have generally been seen as consistent with RPI). In contrast, using either the full timeframe available, or a shorter timeframe across which the different inflation measures are more clearly defined (i.e. since 1950), the UK evidence from the table above supports a TMR range for RIIO-2 of 7.5% to 8.5% relative to CPI (or 6.5% to 7.5% relative to RPI) even when using the Millennium CPI dataset preferred by Ofgem, although in all cases the values would be somewhat higher (by c.1%) if the RPI values from the Millennium dataset were used instead.⁴⁴

We recognise that the data sources referred to above for the levels of equity returns before 1900 are less well established than the DMS dataset and so it may be not be appropriate to place full weight on them in isolation. However, the impact of considering longer-run or shorter-run data is also supported by evidence from the US. Longer-run data (attributed to Prof Siegel) was referred to in the original Smithers report from 2003, and that information can now be brought up to date. An updated estimate by Prof J Siegel gives an average equity market real return from 1802 to 2002 of 6.8%⁴⁵ (on a geometric basis), and if combined with the DMS data from 2003 to 2017 the geometric average from 1802 to 2017 would be c.6.9%. This compares to the geometric real return average since 1900 of 6.5%, or since 1950 of 7.4%. In each case, arithmetic averages

⁴⁴ Note that all these values are based on Ofgem's reduce uplift of 0.77% to 1.77% - the absence of a clear justification for reducing this from the previous value of 1% to 2% is addressed below

⁴⁵ "Stock Market" by Prof J Siegel, University of Pennsylvania's Wharton School, at <http://www.econlib.org/library/enc/stockmarket.html>

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and thus the implied estimate of equity market return would be somewhat higher than these geometric averages, so the usual uplift would need to be added to these values to give an indication of TMR for a price control of relatively short duration (5 years). Moreover, using over two centuries of US data gives results that are closely consistent with the UK values described above from 1825 to 2016. Therefore, the longest-run average for the US from 1802 would appear to support a real TMR value of at least c.7.7% to 8.7% (using Ofgem's reduced uplift), or almost 8% to 9% using the previously used 1% to 2% uplift.

In summary, therefore, Ofgem's (and the UKRN report's) interpretation of long-run average returns is a key part of the proposed methodology for setting TMR, but involves multiple decisions, where at every step the approach that has been adopted has been that which leads to a lower estimate of TMR:

- It assumes that the CPI values for 1900 to 2016 in the Millennium dataset are reliable values of CPI, in spite of the reasons for questioning this. In contrast, it considers the RPI values from the same source (even though these are also published elsewhere by the ONS and House of Commons Library) to be unreliable and so attaches no weight to the real returns on an RPI-stripped basis that would be calculated using these values.
 - Whilst Ofgem's CPI-stripped average return is 6% to 7% (based on the use of the Millennium databook CPI values), the RPI-stripped average return would be 5.8% to 6.8% if the Millennium databook RPI values are used, which implies a TMR value of 6.9% to 7.9% relative to CPI (using Ofgem's assumed c.1% RPI-CPI wedge)
- Furthermore, the methodology attaches no weight to the average 'real' returns from 1900 to 2016 reported by DMS using their preferred measure of historical inflation.
 - This has a geometric average of 5.5%, where these values should be considered to be on an RPI stripped-basis given that DMS use either RPI or the index of retail prices across most of the timeframe.⁴⁶ Adding Ofgem's assumed geometric to arithmetic uplift (0.77% to 1.77%) and assumed 1% RPI-CPI wedge, the implied TMR would be 7.3% to 8.3% on a CPI-stripped basis.
- The result also depends on the choice of 1900 as the start date for the calculation of long-run averages.
 - If the start date is brought forward, the calculated real average return increases, by c.1% if the start date was around 1920, and by c.2% if the start date was around 1950.
 - It also appears, from the information on UK equity returns prior to 1900, that an earlier start date would also give higher long-run averages, increasing the overall average by between 0.65% (using data back to 1870) and 1.5% (using data back to 1825).
- The impact of changing the start date of the averaging is also confirmed by consideration of the average long-run realised returns in the USA.
 - The average from 1802 to 2017 is seen to be higher than the average since 1900 only, having a value of c.6.9% on a geometric real basis: this would support a real TMR value of at least c.7.7% to 8.7% using Ofgem's reduced uplift of 0.77% to 1.77%. Using only more recent data from 1950 instead would give even higher average returns and thus TMR estimates.

⁴⁶ CPI is only used for the period since 1988, which represents less than one quarter of the full timeframe from 1900 to 2016.

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In the bullet points above, the impact of each change is shown in isolation, but in some cases the effect of these changes would be cumulative. The individual effects on the TMR values implied from long-run average returns can be summarised as follows⁴⁷:

	UKRN's range	Using Millennium databook RPI values	Using DMS's inflation series	Using an earlier start date for the averaging	Using a later start date for the averaging	Using longest-run int'l data, from US)
Inflation series used	Millennium, databook CPI series	Millennium databook RPI series	DMS's inflation series	Millennium databook CPI series	Millennium databook CPI series	US Inflation data
Averaging period used	1900-2016	1900-2016	1900-2016	1825-2016	1950-2016	1802-2017
Relative to CPI	6 to 7%	6.9 – 7.9%	7.3 – 8.3%	7.5 - 8.5%	8.25 – 9.25%	7.7 – 8.7%
Relative to RPI	5 to 6%	5.8 - 6.8%	6.3 - 7.3%	6.5 – 7.5%	7.25 – 8.25%	6.6 – 7.6%

Therefore, giving due consideration to the alternative approaches described, a more rounded and better-justified view of TMR based on long-run realised average returns would be at least from 7% to 8% (relative to CPI) rather than UKRN's proposed 6% to 7% (on a CPI-stripped basis). This is even using Ofgem's reduced uplift from geometric to arithmetic returns of 0.77% to 1.77%. As explained below, we don't consider the case has been made for reducing the 1% to 2% uplift which has consistently been used previously.

Cross-checks of long-run averages

Ofgem also seeks to make a number of cross-checks of the average realised real returns in the UK and consider both average realised returns on a 'world market' basis and alternative methods for estimating TMR. Considering first the 'world markets' values, we note that the UKRN report itself explains why such values should be viewed with caution and may be an underestimate of expected returns (see page D-121): *"Given that large number of stock markets experienced being nearly wiped out during World War 2 or widespread nationalisation without compensation in various revolutions, the global realised historical return may understate ex-ante expected returns."*

In addition, advice previously provided to Ofgem in the Wright and Smithers report in 2014⁴⁸ considered the relevance of international returns data. The discussion of the factors that influenced global returns during the first half of the 20th century would suggest for world returns focus should be on the period from 1955 onwards - which (to the start of 2017) would be around 6.1% (geometric, real, in US\$ terms, excluding the US), and commensurately higher than this on an arithmetic average basis – observing further that *"It is notable that the global average return in the postwar sub-sample 1955-2012 (which arguably is less contaminated by the impact of either capital destruction or over-valuation) is extremely close to MMR's original assumed figure."*

In any case, to the extent that an international comparison of returns is seen as informative, it may be more meaningful to consider the average realised returns in the USA. The DMS dataset shows that the geometric and arithmetic averages since 1900 are, respectively 6.5% and 8.4%, somewhat higher than the corresponding values for the UK. Furthermore, as shown above, if the US returns dataset is extended back further, to 1802, the calculated long-run average returns increase further (to around 6.9% on a geometric average basis). We recognise, of course, that

⁴⁷ Still using Ofgem's geometric to arithmetic uplift of 0.7% to 1.7% with which we do not agree as discussed below; and also using Ofgem's assumed 1% wedge between RPI and CPI

⁴⁸ "The Cost of Equity Capital for Regulated Companies: A Review for Ofgem", Stephen Wright and Andrew, 2014, pages 7 and 8

there are limits on the weight that should be placed on the results from a single other country, but the US market is the largest market in the world by far (6 times larger than any other, and accounting for over half of total world market value) and in many respects, it provides a much better comparator to UK stock markets than that of many other countries.

In conclusion, a consideration of international returns data, both in the US and on a global basis, would support use of a long-run realised geometric average return of around 6.5% (real, on a US\$ basis), and a TMR value of c.7.3% to 8.3% using Ofgem's reduced geometric to arithmetic uplift range of 0.77% to 1.77%.

Figure 9 and para 3.69 in the Finance annex to the Sector Specific consultation also consider another cross-check, which involves expressing the UK returns since 2016 in US\$ terms. The 5.07% value shown in the figure for the geometric average of UK returns to end 2016 on a US\$ basis depends on a particularly low value of the 'real' exchange rate relative to the US\$ following the 2016 Brexit referendum vote (see Table 73 in DMS 2018), and the value would be higher (c.5.2%) if based on figures to either end 2017 or end 2015.

These values are therefore fairly close to the UK geometric average return relative to RPI in local currency (£) terms described above (either c.5.3%, based on the same inflation data series as used by DMS to 1950 and RPI thereafter, or c.5.05% using the 'composite' series of RPI from the ONS from 1900 to 2016). Thus, once the uplift from geometric to arithmetic average is included, this cross-check would support the range proposed above from 6% to 7% relative to RPI, although it is not clear how relevant this figure is as a cross-check for the returns required by a UK investor investing in £ sterling.

Uplift to be applied to geometric average (towards the arithmetic average)

The UKRN report explains in Appendix E that *"By long tradition, since the CAPM relates to expected returns, market return assumptions are normally expressed in terms of the arithmetic average return. This issue was also discussed at some length in both MMW and in Smithers and Wright (2013). In that discussion we concluded, again, that rather than calculate arithmetic averages directly (which can generate spurious differences, especially when returns are affected by exchange rate fluctuations), it is more appropriate to work from geometric (compound) average returns and add an adjustment of 1 to 2 percentage points, depending on the extent to which regulators wish to take account of serial correlation of returns."*

Appendix E then considers the size of this uplift: *"We would, however, argue that the case for an adjustment to arithmetic averages as large as 2 percentage points (which was implied by the upper end of MMW's range) is distinctly weakened if regulators wish to set returns on a consistent basis at a relatively long (e.g. 10-year) horizon, given that (as noted in MMW) long-horizon returns have distinctly lower volatility than would be the case in a random walk stock market."*

The amount to which the previous uplift range of 1 to 2% might be reduced is not clear in the UKRN report, though Ofgem now suggest that the reduction to this range might be between 0.13% and 0.23% (page 89 of Finance annex). However, the basis for this reduction, including the length of the assumed investment horizon, is not made clear and unless unsustainably long investment horizons are assumed it is hard to see that this reduction could be justified.

Footnote 111 in the UKRN report sets out a formula to take account of the length of investment horizon, and this shows that for holding periods up to 10 years the return should be much closer to the arithmetic average than the geometric average, consistent with an uplift that is much closer to 2% than to 1%.⁴⁹ For a 10-year horizon, the fact that the return is significantly weighted

⁴⁹ "Estimating the cost of capital for implementation of price controls by UK Regulators", Wright, Burns, Mason and Pickford, footnote 111

towards the arithmetic return rather than the geometric return is further borne out by academic and DMS literature as referenced in Oxera's February 2018 report.⁵⁰

Whilst Appendix E of the UKRN report refers in passing to "*a relatively long (e.g. 10-year) horizon*", Ofgem has not indicated what holding period has been assumed. However, a value longer than 10 years has not even been mooted and could not be justified, and a somewhat shorter period closer to 5 years would seem better founded (as we believe the average holding period for National Grid shares is around 4 years). On this basis, the uplift applied to the geometric average should be at least 1.5% and possibly somewhat higher, and the reduction proposed by UKRN and Ofgem has not been justified.

The CMA has also previously considered this question at some length in the NIE (2014) determination, and calculated results using a number of different approaches (see the "return on equity" columns in Table 13.7). The CMA's results showed that for holding periods of 10 years or less, in almost all cases the different methods give a reduction in return relative to the arithmetic average of 0.5% or less, and even for 20-year holding periods the reduction (relative to the arithmetic average) should be no more than 1% and probably somewhat less.⁵¹ Moreover, NERA updated the CMA's analysis of the effect of different holding periods in 2017, and showed that even for holding periods of up to 20 years the average returns remain close to the arithmetic average (i.e. 1 year holding period returns), as well as that "*long run historical averages have increased relative to the estimates presented by the CMA in its 2014 NIE determination by 30 bps on average*".⁵²

In conclusion, even on a conservative basis there appears to be no justification for reducing the 1% to 2% uplift that has been applied in previous price controls, and if anything the evidence outlined above would support a value in the upper half of this range. The level of weighting that should be applied to the geometric and arithmetic returns and approach to be applied in this respect has also been debated extensively across multiple price control periods, with regulators (and CMA) reflecting the balance of evidence which supports an adjustment towards or at the top end of the range. In the absence of any strong justification supported by appropriate evidence and analysis, there seems no case for departing from this precedent.

Cross-checks of TMR Range

Ofgem then seeks to consider the reasonableness of the range for the TMR derived from historical data by comparing it to alternative estimates of TMR derived using different approaches.

Dividend Growth Model estimates of TMR

The first of these cross-checks is to the results of a dividend discount model (DDM) or dividend growth model (DGM) to estimate investor expectations of the TMR.

In March 2018, Ofgem's consultants, CEPA applied a DGM model to estimate a value of TMR from 7.9% to 8.5% nominal (including buy-backs, which seems a more defensible approach than the alternative slightly lower values excluding buy-backs). The model has since been updated, and now gives a 2-year rolling average of 8% (nominal). CEPA's model is explained in Appendix 3 of the Sector Specific consultation.

As we previously explained in our response to the RIIO-2 Methodology consultation, we hold reservations in relation to CEPA's model.

⁵⁰ The cost of equity for RIIO-2, A review of the Evidence, Prepared for Energy Network Associations", Oxera, 28 February 2018, page 19, Box 2.1

⁵¹ Note that the difference at that time between arithmetic and geometric average returns using 112 years of data was c.1.9%

⁵² "Total Market Return for Determining the Cost of Equity at RIIO-2", NERA, 3 November 2017, Table 1

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CEPA's model assumptions are based on FTSE dividends growing in line with short term and long term nominal growth in UK GDP. As noted by NERA *"There are a number of reasons why this is likely to be a flawed assumption, not least because FTSE companies derive over 70 per cent of their earnings from outside of the UK, where forecast GDP growth is higher than the UK" and "UK GDP forecast growth rates in the short term are somewhat depressed (due to factors like Brexit) and are substantially lower than independent analyst forecasts of dividend growth rates for FTSE stocks"*.⁵³

CEPA have clarified that their model is based on the following assumptions:

- The current yield is based on dividend and buy-back yields for the FTSE All-Share index based on Bloomberg data.
- Short-term (from years 1-5) GDP growth estimates are based on OBR UK GDP forecasts.
- Long-term (from year 6 to perpetuity) growth is based on outturn UK real GDP growth from 1950 to 2017 plus an assumed CPIH inflation rate of 2%.

This confirms that the short-term growth rate assumed in CEPA's formulation of the DGM uses a high level indicative value rather than a true estimate, which seems at odds with standard practice. As the CMA explained in NIE (2014) at para 13.151, *"A commonly used approach is to project dividends using analysts' forecasts (which extend out by four or five years) and a longer-term dividend growth rate"*. This was the approach used by the Bank of England in its recently improved DGM model, which uses *"short-horizon dividend expectations using survey data from equity analysts"*. Chart 3 in the BoE paper⁵⁴ shows that for the FTSE index these forecast growth rates have typically been in the range from 5% to 10%, so somewhat higher than CEPA's central assumption. Even in their more recent sensitivity analysis, CEPA have only considered short-term growth rates in the range from 1 to 6% (see Figure 21).

CEPA have also attempted to address the deficiencies in their long-term growth assumption by considering two sensitivities as well as the central assumption:

- The central specification is based on UK historic GDP growth and gives a long-term growth estimate of 4.5% (nominal).
- The first alternative specification is based on UK historic dividend growth: this gives a long-term growth estimate of 3.1%, based on 1.1% real dividend growth since 1950 plus an assumed CPIH inflation rate of 2%.
- The second alternative is described as being based on international GDP growth: this gives a value of 5.3%, based on a weighted average of UK and international GDP growth, with the international rate found by adding the difference between the IMF's short-term advanced economies GDP growth forecasts and the OBR's short-term GDP growth forecasts.

Clearly, none of these approaches actually address the fundamental criticism of the long-term growth rate assumption. None of them result in an appropriate value that is a properly weighted estimate of the growth rate based on long-term GDP forecasts for the different world regions from which FTSE listed companies derive their earnings. The BoE explains their approach, which better addresses this issue, in the following way *"The weight on each region is chosen to match the share of revenues that firms in the equity index derive from that region. The weights vary over time, reflecting the changing geographic exposures of each index."* As shown in the

⁵³ "Total Market Return for Determining the Cost of Equity at RIIO-2", NERA, 3 November 2017, pages 8 and 9

⁵⁴ "Topical article: An improved model for understanding equity prices", Bank of England Quarterly Bulletin, 2017 Q2

BoE paper⁵⁵, this results in a long-term growth rate which (as of 2016) was around 6%. Again, this properly based estimate is higher than any of CEPA's scenario's, even the highest.

Given that CEPA's values for both short-term and long-term growth rates are based on poorly founded approaches and both result in values which are below a reasonable estimate, the estimates of TMR from CEPA's DGM model will be significantly downwards-biased. In fact, extrapolating from the values plotted on Figure 21, if better-founded estimates of short and long-term growth rates of around 7% and 6%, respectively were used, the implied TMR would seem to be around 10%. If this is then combined with an assumed future 2% rate of CPI (consistent with the value assumed by Ofgem in Table 13 of the consultation annex), the implied real return of c. 8% relative to CPI is consistent with the top of our TMR range based on historic realised returns.

In any case, as we previously noted, given the need to estimate the values of input parameters to the DGM, it would seem to be preferable for the regulator to source DGM estimates for use as a cross-check of TMR from reputable and independent organisations who regularly publish DGM results for wider usage, rather than commissioning and using a bespoke modelling result to inform a price control. Bloomberg has published an estimate of TMR for many years, and as referenced above the Bank of England has a DGM model which gives estimates of equity risk premium, and whilst the corresponding RfR estimate has not been published plausible values⁵⁶ can be combined with the equity risk premium during 2017 to give a view of TMR. Both Oxera for the ENA⁵⁷ and NERA⁵⁸ used Bloomberg and Bank of England data to conclude that the TMR range derived using the DGM approach was in the range of 7% to 8% relative to RPI, and the more recent values from Bloomberg show that since then DGM estimates of TMR have increased by c.1.5 % or more, with the daily values during 2018 generally lying in the range from 12% to 14% nominal.

Finally, on TMR estimates from DGM models, it should be noted that these results are the implied annual return that would be expected on an investment that is held in perpetuity, assuming the dividend growth rate is serially uncorrelated and a stationary dividend yield. As Oxera have previously observed, *"Investments that are not held in perpetuity are subject to an additional source of risk in annual returns—the higher volatility of the annual rate of capital gain relative to the volatility of the dividend growth rate—i.e. volatility of the price–earnings (P/E) ratio. Estimates of the risk premium for a one-year holding period relative to a perpetual holding period depend on the volatility of the annual rate of capital gain relative to the volatility of the dividend growth rate. Fama–French (2002) estimated this adjustment to be 130bp based on US data."*⁵⁹ Even though investors in energy networks might be expected to have investment horizons that are on average longer than one year, some increase to DGM-based estimates of the TMR to account for P/E ratio volatility would be appropriate. Other commentators have suggested larger increases around 1.5% to 2% should be added to forward projections of TMR (using DGM) to allow for this

The views of investment managers or advisors

Ofgem also makes reference (para 3.77 to 3.78) to using the views on TMR that have been expressed by investment managers or advisors as a possible cross-check of the TMR estimates that are derived from historic realised returns and DGM models. Ofgem suggest that these forecasts which average 6.59% are *"significantly lower than the 8-9% nominal TMR range we*

⁵⁵ "Topical article: An improved model for understanding equity prices", Bank of England Quarterly Bulletin, 2017 Q2, Figure 7

⁵⁶ Based on long-run spot index-linked gilts during 2017

⁵⁷ "The cost of equity for RIIO-2, A review of the Evidence, Prepared for Energy Network Association", Oxera, 28 February 2018, page 27 and 29

⁵⁸ "Total Market Return for Determining the Cost of Equity at RIIO-2", NERA, 3 November 2017, Page 5

⁵⁹ "The cost of equity for RIIO-2, A review of the Evidence, Prepared for Energy Network Association", Oxera, 28 February 2018, page 29 and 30

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[i.e. Ofgem] derive from inflating the UKRN Study by forecast CPI.” However, there are a number of factors which suggest that little weight should be attached to this claim.

We are not aware that such evidence has been used or given much weight in any previous price controls, so giving weight to this evidence for RIIO-2, when it appears at first sight to be inconsistent with more established and robust approaches, would seem a significant break with precedent.

Oxera have reviewed this evidence for the ENA⁶⁰, and considering both the FCA’s ‘regulation of market return’ assumptions (which is one of the data values referred to by Ofgem) and the limitations of the evidence from investment managers. Oxera’s conclusions (Section 4 of their report), with which we agree, are as follows:

- *“With regard to evidence from the FCA, the 6–7% nominal range for the TMR is likely to be below a central estimate of the expected TMR, for at least two reasons.*

First, the FCA-prescribed range was designed to ensure that consumers did not suffer from overly optimistic performance forecasts. In contrast, it has been recognised that the costs of setting the allowed rate of return too low for regulated utilities may exceed the detriment from setting too high a regulated return relative to the true cost of capital. It is therefore unclear that the FCA-prescribed TMR range is appropriate for RIIO-2.

Second, the expectation that the welfare-enhancing TMR assumption for the purpose of investment advice would sit towards the lower end of the evidence is borne out by the data. For example, all of the estimates presented by the FCA based on DDMs are higher than the top end of the FCA-prescribed TMR. Moreover, when examining the evidence, the FCA relies on the geometric rather than the arithmetic average.

- *With regard to the evidence from investment management firms, it is recommended that no weight is placed on these observations, due to the limitations summarised below.*

First, in contrast to Ofgem’s original intention, it is unclear whether the evidence presented can be used ‘to advise clients and allocate funds’. In fact, the majority of the underlying publications explicitly state that the figures presented therein cannot be used as estimates of future returns.

Second, academic research and precedents from practitioners show that survey evidence should be attributed little weight. Given that Ofgem recognises the benefit of predictability and stability in regulatory policy, it appears appropriate to attribute more weight to historical evidence than to the individual forward-looking projections.

Finally, if any weight is to be placed on this evidence, the projected growth rates reported therein must be adjusted for the downward bias embedded within such estimates. Academic literature suggests that the adjustment amounts to c. 2%.

- *In sum, the evidence from the investment managers appears to be out of line with the rest of the evidence. In this note we have explored the possible causes of this divergence and conclude that:*
 - *it is unclear that the TMR estimates produced by investment managers are appropriate in the context of a price control; and*
 - *if any weight is to be placed on this evidence, an upward adjustment has to be made, to correct for the downward bias from geometric averaging.”*

Furthermore, the FCA’s aim in setting prescribed rates is to prevent consumers from being misled by inappropriately high rates, and the TMR estimates produced by investment managers have the primary purpose of providing prudent estimates of future returns to their clients, to ensure clients are managing their finances prudently.⁶¹ For this reason, their rates are more

⁶⁰ “Review of RIIO-2 finance issues: Rates of return used by investment managers”, Oxera, prepared for Energy Networks Association, March 2019

⁶¹ “Review of RIIO-2 finance issues: Rates of return used by investment managers”, Oxera, prepared for Energy Networks Association, March 2019, pages 2 and 3

likely to lean towards the low end of the range, in contrast to the regulation of regulated utilities, where it has been recognised that setting the allowed rate of return too low may exceed the detriment from setting too high a regulated return relative to the true cost of capital.

We also note that the CMA, in its Final Determination of the NIE (2014) appeal, considered the suitability of consensus or survey-based approaches from investors, market participants and academics as a possible source for forward-looking estimates of equity market returns. The CMA decided not to give weight to these sources, for reasons explained at para 13.156⁶², but fundamentally because the CMA “*preferred to consider the underlying data on which survey respondents presumably base their views.*” The same rationale would apply to the alternative views of future market returns from investment managers or advisers, who would use the same approaches to estimate these returns (such as an assessment of historic returns and DGM) as are directly available to regulators and CMA.

Conclusion on Cross-checks

We agree that there is merit in comparing TMR estimates based on long-run averages to estimates based on other approaches, provided these are based on reasonable assumptions and are valid comparisons, though these alternative estimates of TMR should be considered cross-checks rather than primary evidence.

We have explained why little weight should be attached to estimates from investment managers, and so the main cross-check that is available is to DGM estimates. As shown above, if these estimates are based on well-founded input parameters, or alternatively published DGM values are used, the DGM estimates are least consistent with the top of the range for historic average returns and in some cases somewhat higher.

We also note that the CMA’s TMR range in the 2014 NIE Appeal Determination was from 5% to 6.5% (relative to RPI), although the CMA commented that the lower end of the range wasn’t as well supported as values higher in the range, and its final point value for cost of equity used the very top of this range. The CMA referenced both DMS data and DGM estimates from the Bank of England in its response. The latest DGM information from the Bank of England would support higher TMR estimates than those that were available at the time of the appeal outcome, mainly due to improved modelling. This gives further support to the view that the 6.5% TMR value (relative to RPI) used by the CMA at that time should be increased

Finally, as discussed more fully below in response to question FQ17 below, the overall cost of equity that is proposed by Ofgem in the sector consultation, which is calculated using the TMR range in the CAPM formula appears to be too low to be credible. Not only is a reduction from 7% to 3%⁶³ from one price control to the next implausible, but the share price reaction for National Grid on the day that the consultation was published took the implied MAR for its UK networks well below 1, even though mature and well-informed investors would recognise that the final cost of equity would need to be reset at a higher and more credible level later in the process. Whilst the extremely low cost of equity that was proposed was partly a result of the inappropriate value of equity beta that was assumed (see discussion below), the low value of TMR is also an important contributing factor, and so the share price reaction provides further market evidence that the TMR value that was assumed by Ofgem in the consultation is too low.

Conclusion on TMR

Ofgem has proposed a range for total market return from 6.25% to 6.75% relative to CPI (equivalent to 5.189% to 5.684% relative to RPI), consistent with the range from 6% to 7% relative to CPI in the March 2018 UKRN report. However, drawing together the discussion in the

⁶² “Northern Ireland Electricity Limited price determination”, Competition Commission, March 2014, paragraph 13.156

⁶³ Or a reduction from 7% to 3.5% before the application of Ofgem’s proposed 0.5% ‘allowed to expected return’ margin

sections above, these ranges are not supported by the evidence. The TMR range should instead be increased, to 6.2% to 7.2% relative to RPI (equivalent to 7.3% to 8.3% relative to CPI, using Ofgem's assumed c.1% wedge for RPI-CPI). The balance of evidence supports a value at or in the top half of this range based on (i) the discussion of the uplift that needs to be applied to the geometric average return (which shows that a value at or close to the top of the uplift range should be used for plausible values of the assumed 'holding period') and (ii) the main cross-check to published or properly calibrated DGM estimates.

As Ofgem shows in the latest consultation⁶⁴, the UKRN's 6% to 7% range (relative to CPI) is 1.5% lower than the earlier 2003 and 2006 Smithers estimates of TMR (6.5% to 7.5% relative to RPI), which was based on the historic returns data that was available at that time. Consistent with Ofgem's reconciliation of the UKRN Study to the previous advice on TMR, it appears that this 1.5% reduction can be attributed to three factors (though the exact split between these is not completely clear). These are:

- a reduction in the long-run average realised returns (which Ofgem further break down into several components, though these can more simply be considered to be a reduction in the average nominal return values used, which is then partially offset by a reduction in average inflation across the full timeframe of the dataset).
- a view that the inflation dataset used to deflate nominal returns can be considered to be a reliable measure of CPI rather than RPI: this reduces the estimated TMR by c.1%; and
- a lower arithmetic uplift (reduced by between 0.13% and 0.23% from the previous 1% to 2% range for this uplift).

Considering each of these in turn;

- Depending on the choice of historic (RPI) inflation measure, we recognise that there may have been some small reduction in the long-run average realised returns from 1900 onwards since the estimates in the early 2000s, though as previously pointed out in an earlier report for Ofgem⁶⁵, some of this reduction was already anticipated when the earlier advice proposing a range from 6.5% to 7.5% (relative to RPI) was given. Consistent with this 2014 report, and from the discussion of the more recent information on the long-run realised historic returns given above, a reduction of circa 0.3% for this factor seems the most that should be implemented.
- As for the second factor:
 - there are good reasons to question the reliability and accuracy of the historic CPI dataset used, in contrast to the RPI dataset published by several sources. On this basis, there is a good case for continuing to follow regulatory precedent, and to estimate TMR relative to RPI from values of long-run realised average nominal returns that have been deflated by past RPI.
 - in any case, there are inevitably significant uncertainties and potentially inaccuracies associated with any single inflation measure when looking so far into the past, as well as there being substantial changes in consumer lifestyles and spending patterns since 1900, so a more balanced view would at least place similar weight on the long-run average realised returns calculated using the different inflation series.
 - In addition, the UKRN's range is based on an estimate of long-run average returns using data from 1900 to 2016, and it appears that if the start date of the average was either earlier or later the long-run averages would increase.

⁶⁴ At Appendix 2 to the Finance annex in the Sector Specific consultation, page 91

⁶⁵ The Cost of Equity Capital for Regulated Companies: A Review for Ofgem", Stephen Wright and Andrew Smithers, 2014

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- Drawing together these issues, on a balanced view there seems no basis for reducing the estimate of TMR based on long-run average returns any further than the 0.3% referred to under the first factor above, although a good case could be made that the best view of long-run average returns would actually be somewhat higher.
- As for the third factor, we are unable to understand the basis for the proposed 0.13% to 0.23% reduction in the geometric to arithmetic uplift. Even though Ofgem talk about setting returns on a long-timeframe basis, the formula given in the UKRN report wouldn't support such a reduction (other than for very long timescales), and neither would the approach of the CMA in NIE (2014). In any case, horizons longer than 5 to 10 years cannot be justified in this context, as the average holding period for network company shareholders is typically somewhat less than this. Ofgem do not explain the basis of the adjustment (i.e. assumed holding period, or formula used to calculate the adjustment), without which this change in uplift cannot be substantiated or justified, and so the proposed change to the previously applied uplift range (1% to 2%) should be dropped.

Therefore, drawing together the evidence and results discussed above, the information on long-run realised returns imply a TMR range that is at least from 6.2% to 7.2% relative to RPI (and therefore 7.3% to 8.3% relative to CPI or CPIH⁶⁶). In addition, the discussion of the geometric to arithmetic uplift which Ofgem have raised has highlighted that for reasonable holding periods (at least up to 10 years and possibly even somewhat longer) a value in the upper half of the uplift range should be used, and the information from the main cross-check (to published or properly calibrated DGM estimates) would also support values that are at least at the top of the range.

FQ10. Do you have any views on our interpretation of the UKRN Study regarding the TMR of 6-7% in CPI terms and our 6.25% to 6.75% CPIH real working assumption range based on the range of evidence?

As discussed above in our response to FQ9, we support due weight being given to the information on TMR from the data on long-run realised returns in published source such as DMS. We also support these values being compared to cross-checks, provided these are based on reasonable assumptions and are valid comparisons, though these alternative estimates of TMR should be considered cross-checks rather than primary evidence. A review of the available evidence, once viewed properly, supports a higher range for TMR (6.2-7.2% relative to RPI), and that a value at or close to the top of this range should be used.

FQ11. Do you have any views on our reconciliation of the UKRN Study to previous advice received on TMR as outlined at Finance annex appendix 2?

Please see our response to question FQ9 for our views on this reconciliation.

Equity beta questions

Ofgem's estimation of equity beta for the energy sector represents more than a 20% reduction in asset beta across successive price controls, an assertion which is not supported by market observations. National Grid's historical data provides strong evidence to inform the ranges for asset beta, yet recent empirical evidence does not support Ofgem's proposed reduction.

⁶⁶ This uses Ofgem's assumed value of 1% for the future wedge between RPI and CPI (or CPIH).

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National Grid's observed data should be the primary source of evidence for beta estimation but we recognise additional data needs to be considered. It is essential therefore, that the process used to estimate the value, particularly where a change from regulatory precedent is proposed, is transparent, replicable, and robust.

In our responses to FQ12 to FQ15, we identify that there are three technical errors embedded within Ofgem's process causing the proposed reduction in beta:

- A lack of consistency in the de-leveraging of observed equity beta data. The time period of a single day used to derive the actual gearing value is not sufficiently robust and is inconsistent with the period of at least five years from which observed beta data drawn.
- Ofgem takes the unprecedented step of adjusting the observed gearing by an assumed value for the market to asset ratio (MAR) of 1.1. Not only is this a technical error which is inconsistent with both regulatory precedent and the finance theory that explains the relationship between observed beta values and company gearing⁶⁷, but is also a double count of the proposal to reduce cost of equity by an assumed ex-ante outperformance wedge. We strongly disagree with both of these adjustments as a matter of principle and we disagree further with the application of two such amendments to cost of equity as they are a double count of the same assumption. In addition, there is no justification for the MAR assumption of 1.1 which results in the arbitrary adjustment to the observed gearing.
- Ofgem has excluded sources of evidence and has not carried out a risk assessment to appraise the results of the beta estimation process. Despite Indepen's recognition that beta decompositions "*may be an important part of the analysis*", Ofgem has not considered disaggregated values in its estimation. This approach has a strong precedent, having for example been used by Ofcom in relation to BT and Openreach.

Furthermore, Ofgem has not included observed beta values for international energy networks as comparators despite this being the recommendation of several consultants. Indepen state that significant care should be taken when trying to draw anything more than a broad range from international comparators due to potential differences in, for example, risk profile, financial structure and tax regime. This is no different to any comparator group which must undergo a similar assessment to determine how their observed equity beta range should inform UK energy networks' equity beta.

We note that Ofgem has received four consultants reports on the topic of beta. Both in the Framework Methodology consultation and in the Sector Specific consultation Ofgem relied on advice on beta estimation from supporting consultants' reports, initially from the UKRN report⁶⁸ and a report by CEPA commissioned by Ofgem, and then subsequently from reports by Dr Robertson (of the University of Cambridge) and Indepen which were again both commissioned by Ofgem. In a number of areas, one or other of these reports have proposed changes to the existing methodology. These suggested changes include basing beta estimates on very low data sampling frequencies, extending the data used to calculate beta over very long timeframes, adopting complex and less established beta estimation methodologies and introducing a new and erroneous adjusted gearing parameter when adjusting for differences between actual and notional gearing. However, as NERA have shown⁶⁹ these reports are in many respects inconsistent, do not support each other and in none of these areas is there a compelling case for departing from established practice for beta estimation.

The consequence of technical errors, biased filtering of evidence and lack of robust process is that Ofgem base their cost of equity working assumption on an asset beta value of 0.35. This is

⁶⁷ It is also different from the approach outlined by Indepen, though as we show below both Indepen's adjustment and Ofgem's misapplication of this adjustment are each flawed and contain errors.

⁶⁸ "Estimating the cost of capital for implementation of price controls by UK regulators", Wright, Burns, Mason and Pickford

⁶⁹ "Review of Ofgem's Commissioned Reports on Beta for Determining the Cost of Equity at RIIO-2", NERA, March 2019, available on NERA's website

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below the value in the PR19 consultation for the water industry of 0.37. The implication is that energy companies hold less risk than water companies, contrary to regulatory precedent from RIIO-1 and PR14 which has set out transmission as having the highest risk. Neither the Sector Specific consultation nor any associated consultancy reports set out a comparative risk assessment of the two sectors and there is no evidence to support the implication that the energy sector is now lower risk than water. To the contrary, we will continue to invest in more complex, bespoke projects, remain exposed to more uncertainty due to the impact of decarbonisation and are subject to greater cyber risk through greater reliance on digital assets.

We recognise that beta is not a simple parameter to estimate. The conflicting reports Ofgem has commissioned give evidence of this. However, it is an extremely important parameter to get right because to do otherwise would materially impact the resulting allowed equity return figures as Ofgem's proposals show. It is clear there is more work that can be done in this area but we would question the worth of this. The work commissioned by Ofgem over the last year has provided no more clarity on the right approach to take than is already in existence through regulatory precedent. There is no reason to suggest another year of work would get to a better justified approach. Regulatory precedent exists for a reason and should be respected for exactly the complexity and interpretation issues being encountered.

Therefore, based on a consideration of the Ofgem, ENA and National Grid commissioned reports, we reach the following conclusions for the estimation of beta, each of which is explained more fully in the pages that follow:

- In selecting the comparator group, for listed companies, where equity beta can be directly estimated, observed data offers a robust starting point but it is important to ensure that estimates are informed by all other available evidence. Given the small number of UK listed comparators, it is appropriate to include those EU listed network companies for which comparative risk assessment suggests that investors face broadly similar risks as those investing in the UK energy sector.
- Observe raw equity beta values using Ordinary Least Squares (OLS) methods, based on high frequency data (daily, weekly) and short time periods (2 to 5 years)⁷⁰ and using data since the 'structural break'
- These raw equity betas should be de-leveraged using actual gearing levels and then re-leveraged using notional gearing assumptions, in line with the conventional approach adopted by UK regulators
- When interpreting the observed beta values for National Grid group, these should be decomposed at asset beta level, i.e. split into its US and UK components, in order to inform the beta value for National Grid's UK networks.

This will ensure the risk associated with National Grid's UK network assets is not understated, given that observed data represents the composite risk for both our UK networks and the lower risk US networks. Similar decomposition of a group 'portfolio' beta might also be appropriate for other companies / comparators too.

- Cross-check ranges against the full range of evidence.

When corrections are made for the errors set out above and the above approach is used, the range for an energy company asset beta is estimated at 0.38 – 0.45 (for a zero-debt beta), consistent with that proposed in our Framework response.

In determining a value within this range, it is important to consider political and regulatory risk and the impact this will have on the valuation of regulated utilities in general and National Grid in

⁷⁰ Though less weight may be placed on the 2-year weekly beta than the 2 and 5 year daily beta and 5 year weekly beta, given the smaller number of observations on which it would be based; and care needs to be exercised when considering weekly beta values given the values can vary depending on which day of the week the aggregation starts from.

particular. There is a perception that since RIIO-1 utilities have operated in an increasingly uncertain political and regulatory environment with a potential for there to be more direct political intervention in the operation of the sector, the most extreme example being Labour's manifesto commitment to re-nationalisation. Whilst Ofgem is independent from political intervention, it is possible and even likely that regulatory uncertainty is influenced by the political environment and the current high-profile focus on the legitimacy of network returns in RIIO-1. This is evident in Ofgem's proposed RIIO-2 framework where we see a clear movement towards a form of regulation which is far more restrictive and interventionist in nature, a proposal which was met with surprise by the market when announced on the 18 December 2018. National Grid's share price fell by 9% in a single day, equivalent to a reduction of £2.6bn in the market cap of National Grid Group, relative to the UK regulated RAV of £19bn.

In light of the current political and regulatory landscape, National Grid commissioned Oxera to assess the political and regulatory risk faced by NG and other regulated utilities in the UK. The report is attached at Appendix 1. The report provides strong evidence that the increased risk is being considered by investors and is having an adverse impact on their valuation assessments. Given that the CAPM market beta is not sufficient to capture all of the risk premium associated with political and regulatory uncertainty, relying solely on CAPM is likely to understate required returns for companies with significant exposure to such risks.

Oxera conclude that in the absence of a benchmark that includes a factor for political and regulatory uncertainty, a pragmatic adjustment would be to select a beta point estimate towards the top end of the plausible equity beta range derived from the CAPM. We support this conclusion.

FQ12. Do you have any views on our assessment of the issues that stakeholders raised regarding beta estimation, including the consideration of: all UK outturn data, different data frequencies, long-run sample periods, advanced econometric techniques, de-gearing and re-gearing, and the focus on UK companies?

Ofgem's assessment has not clearly addressed concerns presented through the Framework consultation in individual network responses and collectively through the ENA. Despite commissioning further studies, there remain several areas where Ofgem's latest thinking for beta estimation contains technical errors, is not properly justified and needs to be revised. Addressing these issues would significantly change the proposed equity beta range for RIIO-2.

National Grid's response to the Framework Methodology consultation explained a number of concerns with Ofgem's emerging proposals for beta estimation. During the development of the RIIO framework in 2010, Ofgem had stressed the importance of 'regulatory commitment', particularly in relation to financial issues and financeability. The central role played by the allowed equity return in financeability has also been emphasised⁷¹, and whilst minor changes to allowed return between successive price controls to reflect major developments over time might be expected, material changes would not. The regulatory principles of consistency and predictability are also important if investors, rating agencies and lenders are to maintain their confidence in the energy network sector and its regulatory framework. Great care therefore needs to be exercised when considering making any changes to the approach adopted in the previous round of price controls to estimate the allowed cost of equity. Supported by reports produced by NERA (which were attached as Appendices to our Framework response), we summarised particular concerns (as previously highlighted) in the following areas.

- We explained the problems with relying on long-horizon data for estimating betas for future price controls, as older data is of limited relevance to the beta values for the companies in their current form, so estimates of beta using a long horizon of data (such as from 2000) do not reflect the current or future risk of the businesses.

⁷¹ "Bristol Water plc, A reference under section 12(3)(a) of the Water Industry Act 1991", Competition Commission, Presented to Ofwat 4 August 2010, Paragraph 10.8

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- We explained that there are number of problems with relying on low frequency data (such as quarterly returns) as had been proposed in the UKRN report; and
- We highlighted that there are a number of reasons why GARCH models should not be used to replace the standard OLS method for estimating observed beta values. In any case once consistent timeframes and data frequencies are used, the results from GARCH seems similar to those from the standard OLS approach, further reducing the case for changing the approach.

Similar concerns were made by other networks and stakeholders in their responses to the Framework consultation. In the December 2018 Sector Specific consultation (Finance annex), Ofgem explains that to address the issues raised by stakeholders regarding beta estimation, two more studies were commissioned, first from Dr Robertson then from Indepen. Ofgem then provides their current thinking with regard to the issues raised by stakeholders in the light of these reports (starting at para 3.105), followed by a working assumption for equity beta, derived from information on 'raw' equity betas from Indepen's report using Ofgem's updated methodology (at Table 12 of the Finance annex).

The Indepen study was designed to address a number of issues not addressed in Dr Robertson's work, as well as questions considered by the March 2018 UKRN and Robertson report, but says that it considers issues from a broader perspective. In many respects, it seems to have superseded Dr Robertson's report and Ofgem's earlier Framework consultation and appears to have strongly influenced the basis of the methodology now proposed by Ofgem for setting equity beta in RIIO-2.

We therefore consider Ofgem's revised position in relation to the issues previously raised by stakeholders alongside the reports of Dr Robertson and Indepen, rather than considering each of the commissioned reports separately under the following questions (FQ13 and FQ14).

In our response below, we make reference to the conclusions of more recent reports which consider these issues. These are:

- A report prepared by Oxera, 'Review of RIIO-2 finance issues: The estimation of beta and gearing' which has been commissioned through the ENA,
- A report prepared by NERA, 'Review of Indepen report recommendations on beta estimation' which has been commissioned by National Grid and is attached at Appendix 2, and
- A second report by NERA, 'Review of Ofgem's Commissioned Reports on Beta for Determining the Cost of Equity at RIIO-2' which has also been commissioned by National Grid and is available on NERA's website.

Indepen state that the issues they have considered are:

- Whether there are structural breaks in the data used for estimation and the implications for the estimates of the cost of capital.
- Whether the standard approach to estimation, using OLS regression analysis, is appropriate given the assumptions underlying the method including whether the estimation window (which could be two-years, five-years, or the period since the last structural break) has an impact on the appropriateness of using OLS.
- Whether other estimation approaches are more consistent with the characteristics of the underlying data.
- The choice of data frequency for the returns (daily, weekly or monthly).
- Whether alternative approaches to estimating risk provide valid options for estimating equity β values, or at least providing supporting information.

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- the impact of capital structure (gearing) on the beta value and whether the approach of de-gearing and re-gearing equity and asset betas that has been used by regulators is appropriate
- establishing individual business unit values when an observed equity beta is a portfolio value for a group of businesses

We consider each of these in turn:

Structural breaks and the implications for estimating beta

We support the use of a shorter time series of data from two to five years. This provides an appropriate balance between the number of observations and accounting for the impacts of structural breaks, the presence of which can result in estimates of beta which do not reflect the current or future risk of the business.

Indepen's analysis identified multiple structural breaks for each of the six listed network companies considered. For example, for the majority there was a break in September / October 2008, and for several of the companies there was a break around 2013 (see Table 2.1 in the Indepen report) though there have been no breaks since.

We therefore continue to support the use of shorter time series of data, for the reasons expressed in our Framework consultation response, and so consistent with Indepen we think more weight should be placed on their shorter-term results (using data since 2013) rather than their estimates based on data since 2008 or 2000.

Beta estimation methodologies (OLS vs GARCH)

We support the use of OLS methods. When using the same timeframes and data frequency GARCH produces similar results to OLS, suggesting there would be no benefit from introducing a less transparent approach which creates unnecessary complexity.

Indepen find that the OLS approach, which is the conventional approach that has been typically used in regulatory price controls across many sectors, can suffer from heteroscedasticity in the error term. Whilst this heteroscedasticity '*biases the estimate of the standard error*' (Indepen page 10), this does not invalidate the use of OLS to estimate empirical beta values and Indepen themselves observe in their conclusions (page 46) that what "*is clear is that OLS should continue to be one of the approaches that regulators consider (given the ease of replication, understanding etc and the fact that the equity β parameter estimates from OLS may be consistent with other approaches) and that corrections to OLS results are possible to correct for heteroscedasticity*".

In any case, Indepen note that the alternative estimation approaches which they have considered (different GARCH models) produce figures that are not significantly different from those generated by OLS (page 45). Thus, whilst our preference remains for Ofgem to derive empirical equity beta values using OLS across an appropriate timeframe and sampling frequency, for the reasons we previously gave, which include that it is simpler, more accessible, easier to replicate, and is strongly supported by consistent regulatory precedent, Indepen's results show that this choice does not (at least at present) have much effect on the beta estimates.

The choice of data frequency

We support the use of higher frequency data (daily, weekly) as it provides more precision in beta estimation when compared to the low number of observations which would need to be relied

upon if using lower frequency data (monthly, quarterly). The most recent precedent from the CMA⁷² explicitly disregards quarterly data for beta analysis.

Indepen note (page 8) that the choice between daily, weekly and monthly data frequency involves a balance between the need for a sufficient number of observations (which depends on the length of the dataset as well as the frequency of observations) and whether greater frequency of observations breaches the statistical assumptions underlying OLS calculations, in particular about the homoscedasticity of error terms.⁷³ Oxera also consider this question in their report and see the benefits of having more data points (from higher frequency data). Given the observation that OLS and GARCH models give similar results, the presence of structural breaks which limits the timeframe of data that should be used, and the potential benefits of further shortening the timeframe of data that is used (as more recent data would be expected to represent better the characteristics of a company and the wider environment as they stand today), we agree with the views of both Oxera and NERA⁷⁴ that the benefits of using high frequency data outweigh those of the lower frequency data.

Furthermore, Indepen note the significant variations between monthly beta values depending on which trading day the aggregation starts from and concludes (see Indepen report Appendix B, section B.4) that *“Monthly data cannot be regarded as particularly suited to calculation of beta given the large amount of variation in data that is masked during aggregation.”* Significant variation is also seen in the OLS beta values depending on which day of the week is chosen for the beta aggregations (see Indepen Appendix B). Thus, Indepen’s Appendix B concludes that *“... as weekly, and even more so, daily data contain much more information than monthly data we are better off modelling at higher data frequencies and explicitly accounting for (G)ARCH error processes.”*

Alternative approaches to estimating risk

We agree that indirect measurement methods are not suitable for estimating beta but disagree that it is appropriate to consider only UK comparators. The dominance of water companies amongst listed UK utilities means that estimates of beta for UK energy networks if based on UK comparators only are likely to be understated, given that companies in the water sector are exposed to less risk. Therefore, it is appropriate to consider as comparators European energy companies which face similar business and regulatory risks to those in the UK sector.

Indepen consider whether there are indirect measurement methods that can be used to derive equity or asset beta estimates, based on accounting data and other risk measures (see Chapter 3), but conclude that neither of these are suitable for use in estimating beta for a regulatory determination. We agree with this view.

In addition, Indepen consider the use of international comparators as well as national comparators, but suggest that *“overall, when listed UK examples exist, it is more appropriate to seek to understand the β values for these rather than to research international comparators.”* Comparators are used in beta estimation when the beta for the specific company in question cannot be directly observed, e.g. because it is not listed, or it forms part of a larger group containing activities in different industries or markets. It follows that when looking at comparators, key questions concern how close a match is the company’s risk profile with that of company in question, and whether the differences can be measured and taken into account. We agree that care needs to be exercised when looking at international comparators, but also note

⁷² “Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991”, CMA, 6 October 2015, Appendix 10.1, para 92

⁷³ Indepen do not even consider the possible use of quarterly data, and we would agree that this very low frequency data should not be used, particularly given the presence of structural breaks in the data.

⁷⁴ “Review of Ofgem’s Commissioned Reports on Beta for Determining the Cost of Equity at RIIO-2”, NERA, March 2019, available on NERA’s website

that comparative risk assessment⁷⁵ shows that those comparators are available with investors in both Spanish and Italian regimes facing broadly similar risks to NG plc investors. It follows that these provide a relevant benchmark to help inform the estimation of the appropriate beta value, particularly where the number of available national comparators is limited, or these have limitations of their own, such as being in a different industry.

The remaining two issues considered by Indepen are not concerned with estimation of observed equity beta values, but instead relate to how these betas values should be used and adjusted to arrive at a suitable beta value for the 'notional' network company for which a regulator sets a price control.

The impact of capital structure on the beta value

The first of these issues concerns the impact of capital structure (gearing) on the beta value and whether the approach of de-gearing and re-gearing equity and asset betas that has been used by regulators in previous price controls is appropriate.

Our view is that Indepen's analysis does not offer any substantial evidence to support departing from the traditional approach to adjusting for gearing, nor is its assumed debt beta range consistent with either academic evidence or previous UK regulators' decisions. Furthermore, Indepen's adjusted 'notional' Enterprise Value gearing measure is based on flawed logic which has no precedent in UK regulation, and which is further exacerbated by Ofgem's misconstrued application.

Ofgem's consultation seeks to summarise the points highlighted by Indepen on pages 36 and 37⁷⁶:

- *“there may not be a linear relationship between asset betas, equity betas and debt betas*
- *even if there is a linear relationship, the traditional approach does not consider the possibility that relative gearing (to the overall market) may be more important than the absolute value of gearing for a company at a given point in time*
- *debt betas should be used if de-gearing and re-gearing is undertaken. Further research is required on estimating debt betas although there is regulatory precedent and academic support for debt betas in the range of 0.05 to 0.22*
- *it is potentially inconsistent to de-gear raw betas using one definition of gearing (Net debt / Enterprise Value (EV)) and then re-gear equity betas using a different definition of gearing (Net debt / RAV). If the Enterprise Value is larger than RAV, then by de-gearing and re-gearing, the notional equity beta may be overestimated. For the relatively pure play UK utility companies, recent EV/ RAV ratios have been about 1.1x and these are reflective of average values since 2015. Therefore, it may be appropriate to adjust the observed EV gearing for the purpose of re-gearing betas to a notional RAV gearing level.”*

⁷⁵ “Review of Indepen report recommendations on beta estimation”, NERA, 13 March 2019, pages 25 and 26

⁷⁶ Ofgem also assert on page 36 of the consultation that Indepen recommend that “regulators should be willing to exercise judgement in terms of comparing the effects of de-gearing and re-gearing, with the original raw beta estimates from the market” but this is not what Indepen actually say (see the bottom of page 34) – instead, Indepen support “using regulatory precedent and “normal” values to derive assumptions” with a sense check not just to “observed equity β s” in isolation but to “observed equity β s, gearing levels, risk profiles etc” together.

Considering these points in turn:

Relationship between equity, asset and debt beta

Raw betas are not reliable in setting or cross-checking allowed returns for RIIO-2. The proposed notional gearing is significantly different from the actual gearing that has been observed for the comparators used by Ofgem. Not to adjust for differences in gearing would be an unjustified departure from regulatory precedent, and inconsistent with standard finance theory which recognises that beta values and cost of equity depend on gearing.

Indepen go on to suggest that it may not be the case that the relationships between equity, asset and debt betas are linear, but this report gives no proposals for how this might be taken into account other than to exercise care in interpreting beta estimates that have been adjusted for gearing. Such an observation does not give any basis for departing from the traditional approach to adjusting for gearing.

Mason, Pickford & Wright suggested in the UKRN report that equity betas should not be de-leveraged and re-leveraged (though the fourth author of the report disagreed). Subsequently Indepen provided an equity beta range without adjusting for leverage, based on the assertion that the actual gearing levels are sufficiently close to the assumed notional gearing such that the impact would be small. However, the actual gearing levels reported in Indepen's report are quite different from Ofgem's assumed notional gearing for RIIO-2. The report then goes on to consider the methodology for de-levering and re-levering. Ofgem themselves say, at para 3.106 in the Finance annex of the Sector Specific Consultation, that

"we [Ofgem] disagree with the argument that the consideration of raw equity betas (absent the effect of any gearing adjustments) has no merit. Raw beta estimations are more reflective of actual investor costs and avoid the potential for the effects of gearing to be misunderstood".

But then continues, at para 3.108, that

"we [Ofgem] note from the Indepen study that de-gearing and re-gearing should be applied but that raw beta values should also be employed as a cross check."

We do not agree that raw equity betas should be used either as a basis for estimation or cross-checking beta. NERA⁷⁷ provide evidence consistent with the principle that higher financial risk is associated with higher expected returns such that the use of raw betas is not reliable. Re-levering to ensure the estimation reflects fundamental business risk is in line with regulatory precedent and facilitates the direct comparison of equity betas on a consistent basis.

We recognise that Ofgem's proposed approach for estimating the notional equity beta range as set out at Table 12 in the Finance annex of the Sector Specific consultation, does adjust for these differences, although as explained more fully below, the detailed approach contains methodological errors as well as using inappropriate parameter values.

Observed raw equity beta values

Ofgem states (at para 3.109 in the Finance Annex) that Indepen's shorter term results imply a raw equity beta of up to 0.7, but this does not accurately reflect the information in the Indepen report, as Table 5.4 shows values in the range from 0.68 +/- 0.05, based on applying a range of estimation methods to NG, Pennon, ST and UU. Furthermore, as noted elsewhere in this response, we do not agree with the raw beta ranges used by Ofgem in the Finance annex and believe higher values would be estimated once the best justified estimation windows, sampling frequencies, estimation methodologies, range of comparators and group beta decompositions are applied. However, in the sections which follow which illustrate the flaws in the

⁷⁷ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 4

methodologies for de-gearing/re-gearing beta that have proposed by Indepen and Ofgem, we have, in the interests of simplicity, adopted Ofgem's raw beta range.

In addition to the issues discussed elsewhere in this response, it should be noted that the raw equity beta values calculated by Indepen before adjusting for leverage are based on the comparator companies' observed equity betas at their actual gearing without making any Bayesian adjustments. Similarly, in their reports, Oxera and NERA have not made any Bayesian adjustments. Such adjustments are, though, sometimes introduced in order to address the probability that where observed betas are less than one these are underestimated, as a consequence of statistical or market factors. One of the known limitations of CAPM is that the actual returns of low-beta stocks appear to be higher than the CAPM's predictions, and the returns of high-beta stocks appear to be lower than CAPM predictions. In order to address this problem, there is regulatory precedent for application of adjustments to raw beta values before making de-leveraging and re-leveraging, both in the UK and overseas. For example, in PR14 Ofwat applied the Blume adjustment: this is an attempt to adjust for forecast future betas based on historical observations and is based on the empirical estimate of weighting up future betas, using the equation $\beta_{\text{future}} = 0.667 \times \beta_{\text{past}} + 0.333$. Applying this Blume adjustment to the raw equity beta values used by Ofgem at Table 12 of the consultation would increase the range from between 0.6 and 0.7 to between 0.733 and 0.8. Whilst it may not be justified to rely fully on the increased beta estimates that this adjustment gives, some weight should nevertheless be attached to them, and would further support choosing a higher beta (or at least a beta at the top of the estimated range.)

Consideration of overall market gearing

Indepen suggest that the average level of gearing across the national market as a whole has changed over time. They suggest this may need to be considered when adjusting observed equity beta values for gearing, although it is not clear how this should be taken into account. Moreover, Indepen's information (Chart 1) only covers the period up to 2004, whereas the information in CEPA's report on RIIO-2 for Ofgem⁷⁸ (page 94 Figure C.2) gives more recent information up to 2017 and shows lower overall gearing levels. When combined with the information in the chart in Indepen's report there is no clear overall trend across the full period that needs to be taken into account. Similarly, if a shorter timeframe of data is used in calculating equity betas (e.g. since 2013 rather than 2000), the variations in overall market gearing are small and do not need to be considered.

Assessment of debt beta

Regulatory determinations and recent estimates support a debt beta in the range of 0 to 0.1

Indepen note there are challenges to estimating debt beta in a robust way which are yet to be overcome, and so further work would be needed to update previous assumptions. Whilst the report refers to a broad range of UK regulatory precedent for debt betas from 0.05 to 0.22 (page viii), it also states (page 29) that "*if Ofgem is minded to use a debt beta value in the short-term then regulatory precedent would suggest a value of around 0.1 (bearing in mind that recent proposals cover the range 0.05 to 0.15).*" NERA have reviewed evidence on debt betas and recommend a range of 0 to 0.1 based on regulatory determinations and supported by more recent estimates⁷⁹, and this is further supported by evidence from Oxera⁸⁰.

⁷⁸ "Review of cost of capital ranges for Ofgem's RIIO-2 for Onshore Networks", Cambridge Economic Policy Associates Ltd, February 2018

⁷⁹ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, page 22

⁸⁰ "Review of RIIO-2 finances: The estimation of beta and gearing", Oxera, March 2019

De-gearing and re-gearing of raw beta values

Whilst Ofgem recognise the need to adjust beta values for differences in gearing, in response to Indepen's discussion of this issue Ofgem now propose to depart from the traditional approach to making this adjustment. This change has a significant impact on the proposed equity beta at the assumed notional gearing (currently a working assumption of 60%) for RIIO-2.

As explained below the conceptual basis for the proposed approach is flawed, but in addition the justification for adjusting the observed EV gearing relies on the removal of anticipated outperformance from the allowed return, which is the same justification as for the reduction of cost of equity for an assumed ex ante outperformance wedge. We disagree in principle with both adjustments but draw attention to the fact that application of two such amendments to cost of equity is at least a double count of the same assumption.

Furthermore, Ofgem need to consider the symmetry of its proposed adjustment. The regulatory framework should offer companies an equal opportunity of out and under performance. On this basis whilst Ofgem's adjustment claws back outperformance in RIIO-2, it may be the case that upward adjustments are needed to address underperformance in future price controls. This could be viewed as consumers providing relief for poor performing networks whilst also creating volatility in a parameter which we would not expect to move materially between successive price controls. Ofgem must consider whether they would credibly be able to commit to such an intervention.

On a practical basis, we also have several concerns with how Ofgem's approach has been applied. Firstly, Indepen's recommendation to adjust for inconsistency, as they see it, in the de-leveraging and re-leveraging values assumes that MAR will be greater than 1 with no clear justification. NERA's analysis⁸¹ shows that it is necessary to calculate adjusted MARs to account for non-UK/non-regulated activities, and once this adjustment is made the values are not significantly different from 1 given the recent trends and the relatively wide range of possible values obtained. From this it follows that Indepen's adjustment not only has no precedent in UK regulation, but is not required in practice given there is no evidence that MARs for the comparator group are significantly different from 1.

Of greater concern, would be the clear inconsistency which would exist if a different 'adjusted' gearing level was used in the re-gearing calculation and thus calculation of the allowed cost of equity, from that used in weighting the cost of equity and cost of debt to calculate the allowed WACC. As NERA, have shown, if Ofgem were to follow Indepen's approach, application of an assumed MAR may give a lower 'adjusted notional gearing' and thus a lower rate of return on equity, but consistency would then require this same 'adjusted notional gearing' to be used in working out the WACC. Given that, as the CMA have shown⁸², the WACC doesn't vary much with notional gearing, on this basis the overall effect on WACC of applying the assumed MAR would be negligible.

Moreover, Indepen's approach is based on assuming a MAR greater than 1 to derive a 'notional Enterprise Value' for the network which is higher than the RAV. Consistency would then require that the calculated WACC is then multiplied by this 'notional EV' rather than the RAV when working out the overall allowed network return⁸³, and as a result the overall allowed return (in £m) would under Indepen's approach actually be increased relative to an approach that does not incorporate the MAR adjustment.

Finally, whilst we have concerns with Indepen's approach this is further exacerbated by Ofgem's misconstrued application. Rather than working out an assumed notional market gearing, Ofgem

⁸¹ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 4.5

⁸² "Bristol Water plc Final Determination Report", CMA, October 2015, para 10.26

⁸³ This is equivalent to multiplying the calculated cost of equity at the assumed adjusted notional gearing by the notional market value of the equity as the assumed MAR (i.e. notional EV consistent with the assumed MAR less the notional debt); and adding this to the cost of debt multiplied by the assumed notional debt.

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instead apply an adjustment to the actual gearing level that is used to de-leverage the observed equity betas. This results in a higher assumed gearing for the comparators than their actual gearing, and a reduction in the calculated implied asset beta of between 0.02 and 0.03.⁸⁴ This is not only inconsistent with Indepen's approach, which applies the adjustment to notional gearing levels, but also with finance theory which explains how the actual equity betas for companies that are observed reflect their specific capital structures. Each company should be separately de-gearred, using its own market gearing ratio, reflecting the average of its gearing over the period which corresponds to the beta estimation period.

A further error is that Ofgem uses a gearing estimate based on a specific point of time, leading to a lack of consistency between the time periods used to consider observed beta and gearing values.

We provide additional context and detail for our concerns below:

As is stands, application of the proposed approach would result in anomalous and indefensible results, concerns which are supported by NERA's recent report, which considers the theory behind the relationship between cost of equity (or equity beta) and gearing.⁸⁵ The traditional approach to adjusting for gearing as employed repeatedly in past price controls by Ofgem, other regulators and the CMA, should instead be retained for future RIIO price controls.

It is a shared view that cost of equity is affected by financial structure and so needs to be adjusted for gearing. Indepen set out the formula that has been conventionally used for this adjustment:

$$\text{Asset Beta} = \text{Equity Beta} \times (1 - g) + \text{Debt beta} \times g$$

Moreover, in the conventional view, observed equity betas as used in the CAPM are calculated by ordinary least squares (OLS regression) using the formula $[\text{covar}(R_i, R_m) / \text{var}(R_m)]$, where R_i is the dataset of daily return on the particular company's shares and R_m is the corresponding daily return dataset for the equity market as a whole.

The total (debt + equity) value of a company is determined by its expected cash flows, and under the Modigliani and Miller proposition is independent of the financial structure⁸⁶ - so the changes in total company value in response to daily news items and systematic risk are also largely independent of gearing. Therefore, if gearing was to be higher than the actual level (i.e. a company has more debt and less equity), these daily movements in company value represent a higher percentage change on the value of the equity component, and the observed equity beta values are correspondingly higher.

It therefore seems to be a shared view that if the observed equity beta for a comparator company is to be used to estimate an equity beta for a second company which has similar risk but different gearing, the beta needs to be adjusted for the change in gearing. Indepen and Ofgem do not seem to disagree with this view, but instead have concerns if the definition of gearing used for the 'de-gearing' step is different from that used in 're-gearing'. They note that in setting price controls, the observed equity betas relate to the actual market gearing of the available comparator companies, whereas the re-gearing is based on an assumed notional gearing level for the regulated notional company that is subject to the price control.

Ofgem proposes to adjust for this difference in definition by assuming a MAR value based on two of the comparator companies that provided evidence of observed or 'raw' equity betas, as illustrated at Table 12 in the consultation and reproduced below.

⁸⁴ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 4.9

⁸⁵ *Ibid.* Section 4, including in particular 4.8

⁸⁶ Under certain conditions including; no taxes, no transaction costs, no bankruptcy costs, equivalence in borrowing costs for both companies and investors, symmetry of market information and no effect of debt on a company's earnings before interest and taxes.

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	Low	High	Ref	Source
Raw Equity beta	.60	.70	A	Broadly in line with Indepen recommendation as per executive summary
Gearing: net debt / Enterprise Value (EV)	50.8%	50.8%	B	Average of the gearing of 5 utility companies (SSE, NG, UU, SVT, PNN) taken as of October 19th 2018 treating the SSE hybrid security as debt but not including pension fund deficits.
EV / RAV	1.1	1.1	C	Average EV/ RAV for purest play utilities (UU and SVT) on October 19th 2018
Adjusted gearing	56%	56%	D	$D = C * B$
Debt beta	.15	.10	E	Narrowed from regulatory precedent
Asset beta	.35	.36	F	$F = A * (1 - D) + E * D$
Notional Gearing	60%	60%	G	Working assumption
Notional equity beta	.646	.762	H	$H = [F - (G * E)] / (1 - G)$

Thus, whilst the actual market gearing of the companies is, using Ofgem's values, 50.8%, the calculation in effect assumes that the observed beta values relate to a gearing of 56%. This is wrong: as explained above, observed equity betas increase with gearing, and if the companies changed their financial structure so they actually had a gearing of 56% to match the 'adjusted gearing' that is implicitly assumed by Ofgem, the raw beta values that would then be observed would be correspondingly higher than the range of values assumed by Ofgem.⁸⁷ This explains why the adjustment made by Ofgem in Table 12 of the consultation finance annex is technically flawed and unjustified, and is further explained by NERA.⁸⁸

In fact, this approach, in Ofgem's consultation, is not even consistent with the discussion in the Indepen report as set out in the box on page 33 so is not supported by the work of Ofgem's own consultants. We note that the methodologies do seem to result in a very similar final answer, so the failings and inconsistencies in either approach imply equivalent problems with the other. Rather than adjusting the gearing level which corresponds to the observed raw beta value by using an assumed MAR value, Indepen's approach is to generate an implied "Enterprise Value gearing" from the chosen notional gearing and an assumed MAR value. Using Ofgem's values for notional gearing and MAR, 60% and 1.1 respectively, the assumed notional debt is 60% of RAV and the implied notional equity value is 50% of RAV (i.e. 110% - 60%) and so the "Implied EV gearing" would be $50 / (60 + 50) = 54.5\%$. Under Indepen's approach this would then be the gearing level that was used to re-lever the asset beta values (derived from the raw equity beta values which were observed at the actual market gearing) to give an equity beta and cost of equity for the price control. However, there are fundamental problems with this approach too:

- The price control would be assuming a notional gearing of 60% but would calculate a cost of equity applicable for a company which has an actual gearing of 54.5%: this is a clear inconsistency.

⁸⁷ Alternatively, consider a comparator company which was not a regulated company and did not have a RAV: it would not have a MAR value and its asset beta would need to be calculated from its actual market gearing and its correlation to the equity market as a whole.

⁸⁸ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 4

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- NERA show⁸⁹ that consistency would require the same gearing to be assumed in the re-gearing calculation (to convert asset beta to equity beta) and in the calculation of the WACC (where gearing is used to set the weights attached to the cost of equity and cost of debt). As NERA explain, and as previously discussed by the CMA, provided the same gearing is used in these two steps the calculated WACC is relatively insensitive to the notional gearing level chosen, so on a proper application the adjustment proposed by Indepen would make very little difference to the overall calculated WACC and allowed return.
- To assume a MAR of 1.1 in the future price control requires Ofgem to design the price control in a way that will allow networks, on average, to significantly outperform the expected level. For this to be the case, the expected average performance would be equivalent to equity returns being 25% higher than expected (a MAR of 1.1 and notional gearing of 60% implies equity is worth 50% of RAV rather than the notional 40% of RAV). Ofgem would therefore need to show in what parts of the price control they are aiming to set performance or cost targets at levels which companies are expected, on average, to significantly outperform. Moreover, given the regulator is unable to fetter its future discretion so future outperformance in RIIO-3 and beyond cannot be guaranteed, the RIIO-2 price control would need to be set so that the expected future outperformance in RIIO-2 alone would be equal to 10% of the RAV for all companies.
- Even if the assumed MAR of 1.1 was justified, in working out the overall allowed revenues, the cost of equity that is calculated as appropriate to the 'Implied EV gearing' would then need to be applied to an amount of notional market equity that is consistent with the assumed MAR value, which is higher than the equity RAV that would be implied from the assumed notional gearing alone. For example, if the assumed notional gearing is 60% and assumed MAR is 1.1, the amount of equity on which the re-levered equity return must be earned would be 50% of the RAV (i.e. the assumed EV of $1.1 \times \text{RAV}$ less the assumed notional debt of 60% of RAV), where the allowed debt return would still be applied to 60% of the RAV. As a result, the application of an assumed MAR in this way might give a lower rate of return on equity, but consistency would then require that this would need to be applied to a larger amount of equity, and the net effect would be that the overall return on equity in £m would be increased.
- Under Indepen's approach (and also under Ofgem's), the assumed MAR value to be used in the calculations would need to be chosen. However, this would just be a regulator's assumption rather than an objectively determined value, which, even in the absence of the other errors and issues discussed above, would still be a requirement for a legitimate adjustment to the usual re-gearing calculation. However, NERA have shown that even if Indepen's recommendation to adjust notional gearing by a "normal" MAR value was accepted, there is no evidence that this value is significantly different from 1.⁹⁰

The above discussion, as well as the review of the approach by NERA⁹¹, shows that this new approach proposed by Indepen is not justified, and in any case would not result in a lower overall level of allowed returns and revenues. As also shown above, Ofgem's different new approach to de-gearing and re-gearing is also flawed and unjustified. Instead, the traditional approach of taking account of differences in gearing between the actual observed gearing levels of the comparator set of companies and the notional gearing level that is assumed by the regulator for the forthcoming price control should be retained. This conventional approach has the additional advantage of extensive regulatory precedent, having been applied by Ofgem, other regulators and the CMA.

⁸⁹ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 4.3

⁹⁰ Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 4.5

⁹¹ *Ibid.* Section 4

Group portfolio beta decomposition

The final issue considered by Indepen concerns the merits of portfolio asset decomposition. Indepen acknowledges that National Grid Group's overall composite beta can be decomposed into the risks associated with UK and US networks and recommend including the results of such a decomposition in the evidence base when estimating asset beta. However, Ofgem disregard this in their assessment, despite the merits of the approach and the existing of regulatory precedent, having for example been used by Ofcom in relation to BT and Openreach.

Most listed businesses consist of a portfolio of businesses and the observable equity beta values are therefore a weighted average of the different betas of the individual businesses.⁹² As a result, it is preferable to decompose the observed beta values to obtain an estimate for the regulated activity that is the subject of a particular price control. Indepen note (Section 4.2, page 35) that *"This is something that Ofcom has done when regulating BT and has been suggested in NERA (2018) as a necessary adjustment to the National Grid observed beta because the risk profile of the regulated US businesses (about 40% of the company's assets) differs from that of the UK regulated businesses."*

Indepen conclude (see page 39) that *"beta decompositions may be an important part of the analysis given that a strong case can be made for three of the six UK listed network businesses being portfolios of some form (BT, National Grid and SSE)." Even if BT (and SSE) beta values are not being used to set equity betas for the regulated UK networks, the merits of considering the results from decomposing National Grid's beta are clear, given the limitations of the other UK listed network groups; SSE's business includes significant non-regulated activities; and the other UK comparator companies are in the water sector rather than energy.*

Indepen continue *"We do not believe that the assumptions that have to be made for this calculation currently justify the use of the results of the decomposition. With further work on the evidence and assumptions it ought to be possible to refine this and estimate a range of values that can help inform a regulatory determination."* However, NERA have addressed Indepen's reservations in their recent report⁹³, and this decomposition approach has both a much stronger theoretical basis than the MAR innovation that Ofgem propose and a stronger precedent, having for example been used by Ofcom in relation to BT and Openreach.

NERA's analysis shows that the decomposition of National Grid's group beta values would support a materially higher asset beta for the UK networks, up to 0.55 in their latest report, than for the overall group.^{94 95}

Indepen also set out two example calculations in their report (see page 38) and similarly show that decomposing National Grid's beta would be expected to lead to significantly higher beta values for the UK business than for the National Grid Group overall.⁹⁶ Although NERA do not include the full range of decomposed beta values in their final proposed asset beta range given the absence of wider evidence to support these values, the results nevertheless provide evidence that the asset betas that are assumed for RIIO-2 should be somewhat higher than the observed asset betas for National Grid (or indeed the UK water companies).

Notwithstanding Indepen's suggestion that further work would be needed before these results could be relied on, the significant impact that decomposing National Grid's beta would have on the implied beta values for its UK energy networks cannot be disregarded and so weight should be attached to these results.

⁹² More accurately, the asset beta which corresponds to the observable equity beta will be a weighted average of the asset betas of the individual businesses

⁹³ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Section 3

⁹⁴ "RIIO-T2 Beta and Risk Assessment for National Grid", NERA, 30 April 2018, Tables 2.6 and 2.8;

⁹⁵ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, Appendix B

⁹⁶ Note, though, that NERA consider Indepen's examples to be flawed, as Indepen decompose equity beta rather than asset beta.

FQ13. What is your view on Dr Robertson's report?

As explained above, rather than providing a separate review of Dr Robertson report here, we have addressed the implications of Dr Robertson's report for Ofgem's proposed methodology for setting equity beta values in our response to question FQ12 above, and the impact on likely beta values is then considered further in the response to question FQ15 below.

FQ14. What is your view on Indepen's report?

As explained above, rather than providing a separate review of Indepen's report here, we have addressed the implications of Indepen's report for Ofgem's proposed methodology for setting equity beta values in our response to question FQ12 above, and the impact on likely beta values is then considered further in the response to question FQ15 below.

We also attach in Appendix 2, a report by NERA which reviews the recommendations for estimating betas for UK regulated companies that were presented in the report by Indepen. In this report, NERA set out their concerns with Indepen's and Ofgem's analysis and show that correcting for the issues that are identified results in higher asset betas and cost of equity estimates.

FQ15. What is your view of the proposed Ofgem approach with respect to beta?

We do not support Ofgem's proposed approach. It contains technical errors, is not properly justified and needs to be revised. There is little rationale to move away from the common regulatory practice which has been adopted by other regulators in recent determinations. Correcting for the errors in the methodology and using reasonable values for the input parameters leads to a higher range, consistent with those proposed in our framework response, where consideration of political and regulatory risk would imply that a value at the top of the range should be used.

As explained above in our response to question FQ12, we do not agree with Ofgem's updated methodology, and in particular we have concerns with:

- Attaching too much weight to long run-data (such as from 2000), given the presence of structural breaks;
- Adopting new estimation methods (GARCH) compared to those used in previous price controls, even though the case for using these less transparent and less reproducible approaches has not been made (although we note that in any case the results do not seem to be much affected if these methods were to be used);
- Ofgem's (or indeed Indepen's) proposed new approach to de-gearing and re-gearing equity beta values which is unjustified and technically flawed.
- There are errors in some of the input values used, where the basis of the specific parameter values selected is unjustified (e.g. the use of gearing values on a single day).
- Cherry picking in the selection of comparators should be avoided:
 - The effect of decomposing group beta values should be incorporated into the evidence considered when estimating beta, noting in particular that applying this approach to National Grid's observed beta values would imply a markedly higher asset (and equity) beta for the UK networks than for the Group overall.
 - It is unclear which UK network comparators have been given most weight by Indepen and Ofgem, but in some respects BT Openreach would constitute a better comparator than the low risk regulated water companies, and where the (disaggregated) BT Openreach beta would support higher beta values than Indepen and Ofgem have proposed.

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- There is merit in looking at international comparators, especially given that the number of good domestic comparators in the sector is limited, and some international energy companies may be better comparators to UK regulated energy networks than UK water companies

In addition,

- We continue to support the use of high frequency (daily) data, consistent with Oxera and NERA's recommendations;

Ofgem derive a working assumption for equity beta at paragraphs 3.109 and Table 12 in the consultation, which is reproduced below. We agree with this general approach of using observed raw beta estimates from comparator companies and then adjusting for differences in gearing between the actual comparator gearing and assumed future notional gearing, provided the errors in Ofgem's proposed method are corrected and reasonable values are used for the various input parameters. In addition, the observed beta value for National Grid should be disaggregated to isolate the value for the UK regulated business before being used.

The resulting beta estimates should then be cross-checked to international comparators, the decomposed beta for BT Openreach, and the likely impact of increases in regulatory and political risk in recent years.⁹⁷ The increased political and regulatory risk is evident from:

- More frequent political and regulatory news triggering share price falls;
Oxera's analysis shows that since the start of the RIIO price controls, the degree and frequency of adverse share price movement has increased significantly, impacting the demand and valuation of the stock
- An increase in share price volatility since 2016, a period during which the UK Labour party has asserted its manifesto of renationalising utilities if it were to come to power;
Since 2016, National Grid's volatility has been approximately 10% higher than the index, indicating that the total risk of the equity has increased relative to the risk of the market
- A decline in the status of NG and other regulated utilities as 'defensive stocks';
This is evident from a change in the relationship between National Grid's share price and the wider stock market as well as the returns of other defensive securities such as UK gilt yields.
- An increased focus on regulatory and political risk as a valuation driver in analyst assessments.

⁹⁷ "Assessment of political and regulatory risk", Oxera, 4 March 2019

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Table 12 in the Finance Annex to the consultation is reproduced below:

	Low	High	Ref	Source
Raw Equity beta	.60	.70	A	Broadly in line with Indepen recommendation as per executive summary
Gearing: net debt / Enterprise Value (EV)	50.8%	50.8%	B	Average of the gearing of 5 utility companies (SSE, NG, UU, SVT, PNN) taken as of October 19th 2018 treating the SSE hybrid security as debt but not including pension fund deficits.
EV / RAV	1.1	1.1	C	Average EV/ RAV for purest play utilities (UU and SVT) on October 19th 2018
Adjusted gearing	56%	56%	D	$D = C * B$
Debt beta	.15	.10	E	Narrowed from regulatory precedent
Asset beta	.35	.36	F	$F = A * (1 - D) + E * D$
Notional Gearing	60%	60%	G	Working assumption
Notional equity beta	.646	.762	H	$H = [F - (G * E)] / (1 - G)$

This table contains errors and judgments that result in the calculated notional equity beta values being significantly underestimated. In the first instance, these require correction before further refinement of the methodology:

- Para 3.109 explained the basis of the raw equity beta working assumption range from 0.60 to 0.70: “... *this range is slightly above the Indepen recommendation. Whilst there is evidence of raw beta values below 0.6, these are based on longer-term estimates including periods that display structural breaks. The shorter-term (5-year) data imply raw betas of up to 0.7. Whilst we are concerned that a short-term approach ignores relevant information, we have conservatively used a range of 0.6-0.7 as our current working assumption.*” As explained in our answer to FQ12, we agree that more weight should be attached to the shorter-term data as this may be expected to better represent the networks in their current state. However, the raw beta values since 2013 in the Indepen report (see Table 5.4, excluding BT and SSE) actually range from 0.62 to 0.73 (and if SSE is included the range would go up to 0.8), and most of the values would be consistent with a narrower range from 0.65 to 0.7.
- The gearing values applied to these raw beta values should not be the gearing on a single day (19th October), but should instead represent the average gearing across the timeframe of the data from which the beta values are calculated. The gearing values should also be sourced from the same comparator set, both water and energy companies. From the data in the Indepen report (see Table 4.3), the average of the values from April 2014 to April 2018 (again ignoring BT and SSE) would be 46.7% (or 43.5% if SSE is included).
- The debt beta value used appears too high: as explained above, a value of 0.05 is better justified;

Correcting for these three parameters in this way, the notional equity beta range in the table above, based on market information from a limited sample of UK network companies, would become 0.78 to 0.84. Furthermore, the proposed change to regulatory precedent of re-levering, de-levering should also be removed, further increasing the notional equity beta range at an assumed 60% notional gearing that would be derived from the raw beta values in Indepen’s report to 0.85 to 0.92.

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This beta range for energy networks (and National Grid in particular) is increased further by use of the disaggregated National Grid beta. This adjustment has a much stronger theoretical basis than the innovative and unproven MAR adjustment that Ofgem propose, and has a stronger precedent, having for example been used by Ofcom in relation to BT and Openreach. The assessments of this adjustment that were discussed above suggest this could increase the asset beta by up to 0.15 and at least 0.06, which would increase the equity beta (at 60% notional gearing) by at least 0.15. Even if further work is required before this adjustment can be relied on completely, it nevertheless suggests that the beta values that we proposed in our response to the Framework consultation – i.e. an asset beta range from 0.38 to 0.45 (for zero debt beta, so equivalent to an equity beta range from 0.95 to 1.12 at 60% notional gearing) were reasonable, though NERA's latest report has narrowed this to 0.4 to 0.45.

There is also a case for giving weight to the regulated network beta values for BT (i.e. Openreach) – in some respects this is a better comparator to energy networks than water companies. Indepen give observed beta values for BT that are around 0.95 using data since 2013 (and the values over longer timeframes are higher) for an average gearing across this timeframe of c.22%. Even after decomposing the BT Group beta Ofcom have recently concluded that the regulated UK network component of BT (i.e. Openreach) had an asset beta of 0.56⁹⁸ (assuming a debt beta of 0.1, so equivalent to c.0.54 if debt beta was assumed to be 0.05). These values would support the view that the asset and equity beta values proposed by Ofgem are too low.

Lastly, we note that these results are based on raw beta values for several network companies (several water companies and National Grid) as adjusted for the current working assumption (60%) for the notional gearing of the energy networks in RIIO-2. They do not, though, take account of differences in relative risks across the sectors, which would be expected to result in higher values for energy network than for water, and particularly for the transmission companies. It is therefore valid to also give weight to the evidence on beta values from suitable international comparators should be used as an appropriate cross-check. As noted by Oxera⁹⁹ and NERA¹⁰⁰, this would support values that are higher than, or at least at the top, of the ranges based on the listed UK network companies only.

The discussion above shows that the range of equity beta values for a notional gearing of 60% that is derived from Indepen's data using Ofgem's methodology in Table 12 is too low, and once corrected for the specific errors in input values and methodology identified above would increase, from 0.646 to 0.742 (see Table 12), to 0.85 to 0.92. If due weight is then given to the effect of decomposing National Grid's group beta, the decomposed beta values for BT Openreach (as calculated by Ofcom), the relative risks of energy and water companies in the UK, and the beta values of relevant European comparators, the evidence supports an asset beta range from 0.38 to 0.45 (assuming zero debt beta), leading to an equity beta of 0.95 to 1.125 at an assumed 60% notional gearing, for National Grid's UK transmission networks. These values are consistent with NERA's latest analysis¹⁰¹, and the range given in our Framework Consultation Response that was based on the evidence in Oxera's¹⁰² and Nera's¹⁰³ earlier reports. Furthermore, consideration of the political and regulatory risks faced by regulated utilities, which cannot be fully diversified away, points to a value towards the top end of that range.

⁹⁸ "Business connectivity market review", Ofcom, November 2018, Appendix 21 Table A21.1

⁹⁹ "The cost of equity for RIIO-2, A review of the Evidence, Prepared for Energy Network Associations", Oxera, 28 February 2018

¹⁰⁰ "RIIO-T2 Beta and Risk Assessment", NERA report for National Grid, 30 April 2018, attached as an Appendix to National Grid's Framework Consultation response

¹⁰¹ "Review of Indepen report recommendations on beta estimation", NERA, 13 March 2019, page 36, Table 8.1

¹⁰² "The cost of equity for RIIO-2, A review of the Evidence, Prepared for Energy Network Associations", Oxera, 28 February 2018

¹⁰³ "RIIO-T2 Beta and Risk Assessment", NERA report for National Grid, 30 April 2018, attached as an Appendix to National Grid's Framework Consultation response

Cross-checking the CAPM-implied cost of equity questions

FQ16. Do you agree with our proposal to cross-check CAPM in this way?

Yes, we agree that cost of equity should be cross-checked against comparator data. The primary methodology should remain the CAPM with the results cross-checked against a full suite of evidence. However, the differences in the risk environment for the comparators and the networks should be considered to ensure this is taken into account in setting an appropriate range. It should also be noted that some comparisons might provide an absolute floor to the return but do not actually inform the realistic range for the cost of equity.

The second step in Ofgem’s proposed cost of equity methodology is to cross-check the CAPM based estimates of equity investor expectations against other information on the cost of equity. The specific examples of such other information which Ofgem refer to are:

- Market-to-Asset Ratios (MARs)
- professional forecasts from investment managers and advisors
- bids for offshore electricity transmission assets (OFTOs)
- infrastructure fund discount rates.

Recognising the level of subjectivity involved in estimating the input parameters of the CAPM model and as previously accepted by Ofgem, there is value in sense-checking the results against those from alternative methodologies. However, in making such comparisons, it is important to recognise that the CAPM result is unlikely to capture all the risks which are faced by equity investors, and so these additional risks would need to be taken into account when setting the allowed return. For example, networks are exposed to political and regulatory risk which would require an increase in the overall allowed equity return relative to that which is indicated by a strict application of CAPM.¹⁰⁴

In addition to the specific problems with Ofgem’s proposed cross-checks that are explained below, a further concern with Ofgem’s proposed ‘Step 2’ is that the application of the cross-checks does not follow a pre-defined transparent process. As a result, it leaves a lot of scope for selective application of discretion and/or ‘cherry-picking’ of those cross-checks which gives the lowest values with the benefit of future hindsight, creating further asymmetric risk for network companies.

Considering the specific cross-checks proposed by Ofgem in turn:

MARs

MARs are difficult to interpret (as explained in the UKRN report at Appendix J and by NERA) due to sizeable and uncertain distortions.^{105, 106}

‘Transaction’ MARs are particularly difficult to interpret. As recognised by Ofgem, additional complications such as the value that may be ascribed to a ‘control premium’ and the risk of the ‘winner’s curse’ may affect the price paid in an acquisition¹⁰⁷ as well as other transaction specific factors. These are in addition to all the issues that affect listed company MARs. For these reasons, little weight can be attached to inferred cost of equity values that are derived from transaction MAR values.

¹⁰⁴ Assessment of political and regulatory risk, Oxera, 4 March 2019

¹⁰⁵ “Estimating the cost of capital for implementation of price controls by UK Regulators”, Wright, Burns, Mason and Pickford, March 2018, Appendix J; and

¹⁰⁶ “Implications of Observed Market-to-Asset Ratios for Cost of Equity at RIIO-T2”, NERA Economic Consulting, 1 Dec 2017, Page 10

¹⁰⁷ Acquisition premia will generally reflect anticipated synergies, but in practice only a fraction of the anticipated synergies are realised: it is widely recognised that many acquisitions are value-destroying for the successful bidder.

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The MAR values implied by the market values of listed companies are also hard to interpret. As shown by Burns in Appendix J to the UKRN report, it is not possible to disaggregate any overall expected out-performance (or under-performance) between cost performance, incentives performance, cost of debt performance, and differences between the allowed and actual cost of equity. Any premium or discount to RAV could reflect many different possible combinations of anticipated out- or under-performance in each of these separate areas. These may not only be in relation to the current price control and next price control but also all subsequent price controls, as well as being affected by wider market “noise”. After considering the relevant factors, Burns concludes that *“What is evident from this analysis is transaction premia alone do not provide sufficient evidence to make inferences about the cost of equity. Different drivers of outperformance are at play and multiple combinations of various drivers can explain observed premia. In addition, the role of expected outperformance means that the premia may result from unobserved investor assumptions that may be considered unrealistic or optimistic but are nevertheless the reality behind the premia. For these reasons, we consider that evidence from transaction premia is less reliable and much harder to interpret than other sources of evidence on the cost of equity.”* Similar concerns apply also to listed company MARs.

In any case, Figure 11 in Ofgem’s Finance annex suggests that listed water companies have been trading around or even below a MAR of 1 for much of 2018. Whilst the values in the preceding years had been slightly higher, this was at a time when the water company share prices were clearly influenced by macroeconomic factors. Figure 11 shows the MAR values have since fallen. In addition, the level of allowed equity returns in future price controls that was expected by water company investors during 2014 to 2017 is not known, but is more likely to reflect the PR14 value (5.65% at 62.5% gearing) than the lower values proposed in December 2017 for PR19.

Even if the limited examples of listed water companies were trading above a MAR of 1, this would not prove that the whole water industry would trade at the same level. This would be required for the MAR premium to be given any weight as a cross check. It is notable that the three listed water companies are consistently towards the top performers in their industry and indeed were the only three companies to be ‘fast-tracked’ by Ofwat for their recent PR19 business plans. This would suggest these companies, more than others, would be valued highly by investors.

Notwithstanding the difficulties in interpreting MARs that are set out above, if anything was to be drawn from the water company MAR values shown by Ofgem’s Figure 11, it would be that the cost of equity proposed in Ofgem’s Sector Specific Consultation is too low, especially given the higher risk profile of energy networks relative to the water network companies.

The significant reaction of National Grid’s shares to the publication of the sector specific consultation also indicates that the cost of equity proposed in the consultation is too low (the shares closed at 758.7p on 18 December, down from previous day’s closing price of 835.3p). This was the largest one day fall in National Grid shares since 1999 and resulted in the implied MAR values for the group’s UK networks falling well below 1. Whilst MAR values are hard to interpret, if Ofgem want to use MAR values as a cross-check this can only be seen as confirming that the proposed cost of equity is materially too low. Whilst the share price has since recovered, recent analyst reports continue to see the UK business trading at MAR values below 1, for example the RBC note on 6 February when the share price was 847p estimated a UK trading MAR of 0.97 and the Barclays note of 29 January when the share price was 796p estimated a UK trading MAR of between 0.75 and 0.86. Moreover, this needs to be seen in the context of a growing expectation in analyst reports that the allowed return on equity will be reset to a materially higher level in Ofgem’s subsequent RIIO-2 publications i.e. even with an assumed higher allowed equity return than the one in Ofgem’s proposals it remains likely that our UK business will not be trading at a MAR of 1.

Investment consultant forecasts

Ofgem seek to cross-check the CAPM-derived cost of equity using forecasts of Total Market Return (TMR) from investment managers and advisors, applying either Ofgem's proposed beta values or a beta value of 1. Our reservations in relation to these TMR forecasts were explained in our answer to questions FQ9 to FQ11 above. Clearly, to the extent that the information does not provide a meaningful cross-check of TMR, it cannot be used in the CAPM formula to give a meaningful cross-check of the CAPM result. This calculation does not give a cross-check of the CAPM result at all; rather it is simply an alternative CAPM calculation based on a different and less well justified input value for the TMR.

Offshore Transmission Projects

Ofgem then seek to compare the CAPM derived cost of equity to the equity returns required by winning bidders for offshore transmission projects (OFTOs). Ofgem themselves recognise that the very low risk profile for these projects¹⁰⁸ is completely different from that of network operators (see paragraph 3.137), as evidenced by the very different gearing levels. These differences in risk are so great as to make the investment propositions completely different, so the comparison of equity returns is meaningless.

A further concern is that OFTO returns are likely to materially understate the overall equity returns that are actually expected by investors in these projects, as they omit certain significant sources of value (on a probability-weighted or expected value basis). These include investors' expectations that they will be able to benefit from Terminal Value at the end of the initial 20-year contracted revenue stream and differences in the likely tax treatment of the project assets from that which has been assumed in the tender revenue stream.

Ofgem also draw attention at paragraph 3.136 to the falling cost of equity for OFTO projects over time, and suggest that this is a cross-check to the proposed reduction in cost of equity from RIIO-1 to RIIO-2. However, this does not follow – the 3% reduction in OFTO returns may be attributable to other factors which do not apply to RIIO, such as a growing familiarity with the OFTO regime (as has previously been recognised, for example by CEPA in their 2016 report for Ofgem¹⁰⁹). In addition, the higher gearing for OFTO projects implies a relatively small change in the project WACC of c.0.3% over time, which would translate to less than a 1% change in cost of equity at the gearing levels applied to energy networks.

Infrastructure funds

Ofgem's final cross-check is to the discount rates that have been published by several infrastructure funds.

Ofgem present a table of discount rates for several listed infrastructure funds in Table 15 on page 47 of the Finance annex to the consultation, but it is clear that most of these are such poor comparators to energy networks that the information is not relevant to an assessment of the return required by equity investors in energy networks. Ofgem recognise (para 3.139) that the funds "*invest in private finance initiatives, infrastructure and also in private utility assets, such as OFTOs*", suggesting they are not comparable to energy networks. It is confirmed by the disclosures in their publications that, with the possible exception of 3i, the companies invest mainly in PPPs or equivalent projects which have a very different risk exposure to energy networks. The investment funds may be more comparable to OFTOs given their guaranteed full-life revenue streams which are not subject to any regulatory reset risk. In addition, the basis of

¹⁰⁸ OFTOs face significantly lower risks in many areas such as: in relation to the absence of regulatory reset risk as a result of their revenue streams being set for 20 years, corresponding to the full life of the assets; the assets are already constructed, but new; they do not face political risk; and operating and maintenance costs are low, so the corresponding risks are low.

¹⁰⁹ "Evaluation of OFTO Tender Round 2 and 3 Benefits", Cambridge Economic Policy Associates Ltd, March 2016

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the figures quoted by Ofgem is not clear, and in at least one case the values do not seem consistent with those published by the company.

The following extracts have been taken from publications from the infrastructure funds that have been considered by Ofgem, and show that these are poor comparisons to energy networks, as well as confirming the lower-risk strategies that have been taken by these funds.

- The International Public Partnerships (IPP) report includes the following comments, which confirm that the headline discount rates of different investment funds can't even be simply compared to each other, much less to a fundamentally different investment proposition in a different business sector such as energy networks: *"The risk premia takes into account the perceived risks and opportunities associated with each investment"* and ***"In the Company's view, comparisons of average discount rates between competitor investment portfolios or funds are only meaningful if, there is a comparable level of confidence in the quality of forecast cash flows (and assumptions) the rates are applied to; the risk and return characteristics of different investment portfolios are understood; and the depth and quality of asset management employed to manage risk and deliver expected returns are identical across the compared portfolios. As such, assumptions are unlikely to be homogeneous, and any focus on average discount rates without an assessment of these and other factors would be incomplete and could therefore derive misleading conclusions..."***¹¹⁰
- The IPP report shows that their biggest investments are in Cadent and Thames Tideway Tunnel but these are only 14% and 11% of their overall portfolio respectively, **with significant other investments in OFTOs and PPPs and a large number of other similar projects in the UK and overseas**. The reduced risk on these projects from absence of regulatory risk given their largely guaranteed income streams for their whole life means that energy networks are higher risk and need higher returns.¹¹⁰
- The value that Ofgem quote for 3i is **10.3% nominal: this is clearly someway above Ofgem's proposed cost of equity**, so in the absence of any comparison of relative risk or any further analysis or explanation the figures from 3i do not support the low cost of equity that Ofgem propose for RIIO-2.
- In relation to John Laing, Ofgem show the nominal discount rate as 7.3%. Page 26 of the 2017 annual report gives discount rates of 7.6% to 11.8% and 7% to 9% for primary and secondary¹¹¹ PPP investments respectively and broadly similar figures for 'Renewable Energy Investments'. The overall weighted average is 8.8%. **65% of the portfolio was in PPP projects, with most of the rest in (mostly secondary) renewable energy (including 30.9% in wind and solar investments).**¹¹²
- The GCP portfolio seems very different from an equity stake in a network and has changed substantially in nature over time (since it was founded in 2010) – it was **initially 100% PFI, but more recent investments have been in renewable energy and supported housing**.¹¹³ Therefore, changes in discount rate over time aren't in themselves significant, and the numbers aren't comparable to the equity stake in a network – GCP's **investment strategy is that "Investment primarily in debt where**

¹¹⁰ https://www.proactiveinvestors.co.uk/LON:INPP/index/rns/LSE20180906070004_13780559, International Public Partnerships RNS Release, Half Year Results - Six Months Ended 30 June 2018, 6 September 2018

¹¹¹ Secondary investments in PFI and other PPP projects, made after the completion of the construction period, would be expected to carry materially lower risk.

¹¹² https://www.laing.com/uploads/assets/reports_and_accounts/Laing_AR2017_SECURED.pdf?v=180411 2017 Annual Report and Accounts John Laing Group plc

¹¹³ https://www.graviscapital.com/uploads/fund-documents/gcp-infra/web03a_GCPII_AR18.pdf, GCP Infrastructure Investments Limited, Annual report and financial statements 2018, Page 14

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*there is equity that takes the first loss position in the event of project underperformance.*¹¹⁴ Clearly, an equity investment in a network would need a significantly higher return, given the higher risk it faces.

- The BBGI portfolio report gives the first of its highlights as “43 high quality, availability-based PPP infrastructure assets with portfolio performance and cash receipts ahead of business plan contributing to the increase in the 2017 dividend”. This suggests the business (which involved investments overseas, e.g. in Canada, Australia and Europe, as well as in the UK) is not comparable to a UK network equity investment.¹¹⁵
- BBGL adopts a low-risk investment strategy; “**BBGI’s investment policy is to invest in infrastructure projects that have predominantly been developed under the PFI/PPP or similar procurement models**” and only 37% of the portfolio is in the UK. **The portfolio projects are principally operational, and investment in projects under construction will be limited to 25%.** ... In addition, no more than 25% of the portfolio value calculated at the time of investment will be derived from projects whose revenue streams are not public sector or government-backed.”¹¹⁶
- BBGL say “The discount rates used for individual assets range between 7.20% and 9.50%. The value weighted average rate is approximately 7.45% (7.56% at 31 December 2016).” and then “We have differentiated the asset classes with respect to discount rates. For stable operational projects, such as typical schools, hospitals and roads, we have applied discount rates at the lower end of the range mentioned above. ... BBGI continues to apply a modest risk premium for complex prison projects to reflect the higher complexity of such projects, and has also applied a risk premium to a limited number of other projects to reflect the individual situations.”¹¹⁷
- HICL describe themselves as “Delivering long-term, stable income from a diversified portfolio of **infrastructure investments at the lower end of the risk spectrum**”.¹¹⁸ 70% of their portfolio is in PPP with a further 8% in regulated assets (Affinity Water and OFTO), the balance being in ‘demand-based assets’ which are HS1 and French/US motorways.¹¹⁹

Information on trends in required equity returns over time (for HICL and 3i only) are shown by Ofgem in Figures 15 and 16 in the Finance annex. Before attaching any weight to these trends, any changes in the composition of their investments over time would need to be taken into account. In any case, the graph of HICL discount rates suggests these have been fairly steady since 2006 and so this graph wouldn’t support a big drop in allowed return between RIIO-1 and RIIO-2. For the 3i information, although the discount rate used has fallen by circa 3% since 2008 to 2011, the earlier values at that time were not actually reflected in the TMR value in previous price controls.¹²⁰ The discount rate in March 2018 is still over 10% nominal (so 7% real relative to RPI or 8% real relative to CPI). Thus, neither the HICL or 3i data supports a material reduction in allowed equity returns from RIIO-1 to RIIO-2.

Finally, in relation to this infrastructure fund information, we note that paragraph 3.144 in the Finance annex says the data suggests a discount rate from 4% to 4.7% (relative to RPI). Not

¹¹⁴ https://www.graviscapital.com/uploads/fund-documents/gcp-infra/web03a_GCPII_AR18.pdf, GCP Infrastructure Investments Limited, Annual report and financial statements 2018, Page 10

¹¹⁵ <http://www.bb-gi.com/~media/Files/B/BBGI/Attachments/PDFs/2017/2017-annual-report.pdf>, BBGI, Annual Report 2017, Page 2

¹¹⁶ *Ibid*, Page 6

¹¹⁷ *Ibid*, Page 26

¹¹⁸ https://www.hicl.com/sites/default/files/Sept%202018%20Interims%2018%20Results%20vWebsite_0.pdf HICL Infrastructure Company Limited Interim Results Presentation: six months to 30 September 2018 21 November 2018, Page 4

¹¹⁹ *Ibid*, Page 20

¹²⁰ If this 3i discount rate had been reflected in the TMR used for RIIO-1 it would, on Ofgem’s logic, have supported a much higher cost of equity than was actually set for RIIO-1

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only is this entirely above the 3% to 4% range proposed by Ofgem for RIIO-2, but it ignores the 3i discount rate of 10.2% nominal, which is equivalent to 6.9% real (relative to Ofgem's assumed RPI of 3.07%). Therefore, whilst we do not consider the infrastructure fund discount rates provide a meaningful cross-check of the cost of equity for a regulated network operator for the reasons explained above, if Ofgem were to give weight to this information it would support a higher cost of equity than Ofgem have proposed.

In summary, in the light of the drawbacks highlighted above, none of the data sources proposed by Ofgem – MARs, TMR information from professional forecasts from investment managers and advisors, bids for OFTOs, and infrastructure fund discount rates - provide meaningful cross-checks of the required cost of equity for energy networks.

Instead of using these cross-checks, several more direct and reliable cross-checks are available and could be given greater weight.

- DGM estimates for individual listed utilities
- Asset Risk Premium to Debt Risk Premium differential
- Regulatory Precedent

Dividend Growth Model estimates for individual listed utilities

First, a more direct cross-check can be made to estimates of the cost of equity from applying Dividend Growth Models (DGM) to listed utilities. These values would then need to be increased to allow for differences between the actual gearing of the companies and the notional gearing proposed by Ofgem for RIIO-2. As previously shown by Oxera¹²¹, the raw estimated cost of equity values from applying DGM models on a single company basis have been higher than Ofgem are now proposing for the RIIO networks, even before adjusting for (i) differences between actual gearing and assumed notional gearing, for all the companies considered by Oxera; and (ii) differences between National Grid's UK and US businesses. As shown in the discussion of beta decomposition above, this means that the National Grid's UK activities would be expected to have a higher cost of equity than the group as a whole.

Table 5.1 from Oxera's report of 28 February 2018, which shows DGM cost of equity estimates, is reproduced below, (an update of the November 2017 results, using input parameters as at February 2019, would give similar results). As noted above, the values shown would increase materially if the necessary adjustments, such as being re-levered to the regulatory gearing assumption, are made.

	November 2017	6 month average to November 2017
National Grid	8.9	8.6
Pennon	8.4	8.3
United Utilities	8.7	8.3
Severn Trent	7.7	7.6
Average	8.4	8.2

Given that energy networks would be expected to have higher risk and thus need higher returns than water companies, these DGM values suggest that the allowed equity return for energy networks in RIIO-2 needs to be some way above 8.6% nominal (equivalent to 5.6% real assuming 3% RPI, or 6.5% relative to an assumed 2% CPI).

¹²¹ "The cost of equity for RIIO-2: A review of the evidence", Prepared for Energy Networks Association, Oxera, 28 February 2018 – see Section 5.2

Asset Risk Premium to Debt Risk Premium differential

In addition, as proposed by Oxera¹²², a further cross-check can be applied to the cost of equity that draws on evidence from debt markets to ensure that the allowed returns set by the regulator for equity are commensurate with the risk associated with operating and owning the associated assets.

This test is related to the required differential between the asset risk premium (ARP) and debt risk premium (DRP).¹²³ If this differential is too low Ofgem will need to revise upwards one or more of the CAPM parameters they have proposed, to ensure that the cost of equity that is then proposed for RIIO-2 passes the ARP–DRP cross-check, e.g. by increasing the asset beta and/or TMR values.

Regulatory Precedent

Last but by no means least, the cost of equity ‘working assumption’ of 3% seems inconsistent with past regulatory precedent, both Ofgem’s own, with the CMA, and even with Ofwat’s PR19 (even though a relative risk assessment would show that energy networks would be expected to have higher risk and so higher allowed return than water networks). It does not seem credible that a reduction in allowed return between RIIO-T1 and RIIO-T2 from 7% to 3% for NGET or from 6.8% to 3% for NGG can properly reflect any changes in the underlying network risks or market environment. This reduction is a consequence of significant changes in Ofgem’s approach to estimating certain parameters. These not only break with precedent, but undermine the commitments to regulatory certainty which were made by Ofgem when RIIO was first introduced, in recognition of the benefits that this certainty ultimately brings for consumers.¹²⁴

FQ17. Do you agree that the cross-checks support the CAPM-implied range and lend support that the range can be narrowed to 4-5% on a CPIH basis?

As explained in our responses to question FQ9 to FQ15 above, we do not agree with the CAPM range proposed by Ofgem for RIIO-2 of 4% to 5% relative to CPIH, or 2.96% to 3.95% relative to RPI. Instead we have shown that a correction of technical errors and proper assessment of the available evidence would support asset beta values in the range from 0.38 to 0.45 and TMR of 6.2% to 7.2% relative to RPI with the balance of evidence suggesting a value in the top end of the ranges in both cases. With Ofgem’s assumed RfR of -1.68%, the implied cost of equity range would be at least 5.5% (relative to RPI) for transmission, before any cross-checks and before consideration of relative risk. It should also be noted that CAPM does not capture all the risks faced by networks that investors will consider when assessing the level of returns that they require, e.g. political risk, so this range may still understate the value of allowed return which should be set.

The response to question FQ16 shows that none of the alternative approaches and sources of information proposed by Ofgem provide a meaningful cross check of the proposed cost of equity. However, the more informative and relevant cross-checks that we have identified do provide support to the more realistic cost of equity range from CAPM that would result from using our proposed parameter values:

¹²² “Review of RIIO-2 finance issues: Asset risk premium, debt risk premium and debt betas”, Oxera, March 2019

¹²³ The asset risk premium is the additional compensation over the RfR that investors require to invest in a company as a whole. This is the premium for equity risk assuming zero gearing, and should be higher than the risk premium on debt given the lower priority of equity relative to debt in terms of claims on cash flows.

¹²⁴ See our response to the March 2018 Framework consultation and Section 5.3 in Oxera’s 28 February 2018 report for the ENA “The cost of equity for RIIO-2: A review of the Evidence” for a longer commentary on UK and overseas regulatory precedent.

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- The DGM estimates of the cost of equity for individual network companies suggest the cost of equity for energy networks should be at least 5.4% (relative to RPI) but would more accurately imply higher values if appropriate adjustments are made (in relation to gearing, and from disaggregating the National Grid group value).
- The assessment of the differential between the asset risk premium and debt risk premium will indicate an absolute minimum cost of equity for RIIO-2, though will not give a value for the actual cost of equity needed.
- A range of regulatory precedents would also support an allowed cost of equity that is higher than Ofgem's range, and consistent with our proposed range.

In summary, rectifying the individual errors Ofgem have made and considering the full suite of evidence results in an allowed equity return of at least 5.5% (relative to RPI) for transmission.

FQ18. Are there other cross-checks that we should consider? If so, do you have a proposed approach?

As discussed in our response to FQ16 and FQ17, we believe that instead of the cross-checks proposed by Ofgem, the following cross-checks are more informative:

- The DGM estimates of the cost of equity for individual listed network companies.
- An assessment of the risk differential between the asset risk premium and debt risk premium.
- Regulatory precedent.

Expected and allowed return questions

FQ19. Do you agree with our proposal to distinguish between allowed returns and expected returns as proposed in Step 3?

No, we do not agree with the proposal to distinguish between allowed and expected returns. We have fundamental concerns with Ofgem's approach in applying a conceptually and practically flawed policy. The allowed cost of equity is an important part of the regulatory framework and care needs to be taken in determining the rate for any price control period. Adjusting for an estimate of expected outperformance introduces an arbitrary and unnecessary adjustment. Investors value commitment to regulatory precedent and its established principles and arbitrary changes of the nature proposed by Ofgem will create uncertainty impacting the stability of the regulatory regime and putting at risk the investment needed to build the energy networks of the future.

This approach is conceptually flawed because investors cannot expect outperformance of a framework that has not been set yet – they just expect a fair return which gives them equal opportunity of out- and under-performing. This is also fundamentally the reason why Ofgem's proposal is practically flawed because the framework becomes skewed to the downside rather than the upside. However, irrespective of the settlement of the price control, the outperformance wedge adjustment is not a substitute for robust calibration of the various elements of the framework which is where Ofgem should focus to set a fair deal for consumers and investors

First Economics' critique of Ofgem's policy¹²⁵, shares many of our concerns, and sets out several points of challenge for Ofgem to consider before it confirms its RIIO-2 methodologies, as

¹²⁵ <http://www.first-economics.com/allowedexpectedreturn.pdf>

does the ENA commissioned report from Frontier Economics¹²⁶ Both reports outline strong reasons as to why Ofgem's focus should be on developing a framework which incentivises networks to deliver innovation and efficiencies with appropriately calibrated cost and output targets, as opposed to its efforts to determine an ex-ante expectation of out-performance to adjust allowed returns.

Base allowed return and incentives are funding different consumer priorities and should not be confused

Base return has two main roles in the regulatory framework; it should be at a value which attracts long-term investment in new infrastructure whilst also providing a fair return to existing investors. This should not be confused with the role of incentives which are not designed to encourage investment in long-term assets but are short-term rewards or penalties to encourage efficient output delivery in line with stakeholder priorities.

Consumers are willing to pay above the baseline return for networks that deliver incremental improvements and proactively respond to changes in the energy landscape. We will rely on our stakeholder engagement processes to ensure that those outcomes are aligned to willingness to pay. Ofgem must be careful not to adjust long term funding in the asset base for presumed short-term reward, risking withdrawal of equity from the sector.

Allowed return should not be adjusted to compensate for errors in incentive calibration

Assuming existence of an ex-ante outperformance wedge is dependent on the calibration of ex-ante incentives. We disagree with Ofgem's view that information asymmetry means it is unavoidable that the targets it sets will lead to positive expectations of outperformance. Section 5 of the First Economics' report supports this position and sets out clearly the empirical evidence to show there has been no undue bias towards out or under performance in price controls set by UK regulators in the last 15 years, as detailed in our response to FQ20. This has led the authors to state that:

"we agree that that information asymmetry presents challenges for regulators, but we do not agree that regulators are not capable of setting price controls which give the average regulated company a 'fair bet', such that sectors and across time, firms have a roughly equal chance of out- and under-performing."

First Economics' go onto consider the possible reasons of outperformance, the key factors being:

- At the start of the price control, the deal should provide networks a 'fair bet' to perform against but as risks out-turn during the period it is inevitable that expected and allowed returns will begin to deviate as those risks take on either positive or negative values.
- We agree with this articulation and would add that while the distribution of random events may be expected to be symmetrical, this does not mean that such effects would necessarily average out across a group of network companies. The random external events may affect all network companies systematically (for example fortuitous real price effects) and there is some evidence that companies happen to have benefited from such effects under RIIO-1 so far. This has been recognised by Ofgem and is already being addressed through the introduction of more indexation and the application of returns adjustment mechanisms to protect both consumers and investors from windfall gains and losses.
- Incentives-based regulation is designed to encourage networks to drive efficiencies and service improvements and as such a regulator should want to see a positive difference between expected and allowed returns as opposed to seeing it as weakness in setting

¹²⁶ " Adjusting baseline returns for anticipated performance: An assessment of Ofgem's Proposals", Frontier Economics, 12 March 2019

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the price control. The efficiencies revealed will ultimately drive reduced costs for all consumers by exposing best practice for the industry.

On this basis, achieving the outcomes RIIO was intended to drive should not be seen as justification for making arbitrary adjustments to correct perceived errors. Instead Ofgem should be using the regulatory toolkit they have available to set out cost and incentive targets which are calibrated such that outperformance is only achievable when networks make incremental improvements to current behaviours, without building in an expectation that the deal could be calibrated incorrectly. The 50 basis points downward adjustment has little justification and is based largely on a proportion of RIIO-1 performance (which is still far from certain), even though historic levels are not representative of potential outperformance in RIIO-2. Changes are being ignored, despite the proposed framework for RIIO-2 being significantly different with a much narrower Return on Regulatory Equity range as the scope for outperformance is curtailed.

Furthermore, Ofgem uses the fact that returns still fall within its proposed cost of equity range to justify the adjustment (para 3.167 of the Finance annex of the Sector Specific Consultation). Frontier point out that staying within the range should not provide comfort to Ofgem, as when considered through the framework of aiming up it is likely that Ofgem allows too low a return. Ofgem's proposal to select the centre of its cost of equity range, before applying the 50 basis points downward adjustment, is a departure from well-established regulatory and CMA precedent, with a paper by Ian Dobbs (2011) cited as primary evidence for selecting a point between the 75th to the 90th percentile. This is on the basis that the detriment to consumers of setting cost of equity too low far outweighs the impacts of it being too high, the risk being that investments are deferred or cancelled because they no longer meet hurdle rates.

Investors expect a fair return – they cannot differentiate this between base return and outperformance

Ofgem's assertion that investors assume outperformance is conceptually flawed because it assumes assessments can be made on an ex-ante basis. Fundamentally, historic performance is not an indicator of what may happen in the future. This is because benefits are passed on in full to the consumer and targets re-based at each price control so repetition of the same deal cannot be assumed. Therefore, investors cannot expect outperformance of a framework that has not been yet set, particularly one which is fundamentally changing the risk /reward profile.

Instead, what investors seek from any price control settlement is a 'fair bet' such that firms have a roughly equal chance of out and underperforming. The proposed package as it stands does not achieve this balance as it is creating an asymmetric profile which is skewed to the downside rather than the upside for networks, we have set out how in our response to CSQ86. To put this further into context, the 50 basis points adjustment is equivalent to a 5 to 14% totex efficiency depending on level of totex in RIIO-2, despite GT totex underperformance throughout RIIO-1. The scale of efficiencies required to earn a level of return equal to allowed is therefore significantly challenging and CMA precedent has shown Ofgem may find their proposal difficult to justify. An analogous top down totex efficiency originally applied by Ofgem in RIIO-ED1 for smart grid efficiencies was rejected by the CMA on appeal as there was no evidence. The CMA's views were:

*"... there has to be, in our view, a limit to the discretion of regulators to make adjustments to the costs assumed in setting the price control where the consultation process has failed to demonstrate evidence in support of those adjustments."*¹²⁷

With no justification for the inclusion of an outperformance wedge, Ofgem need to consider carefully the negative consequences for sector confidence and incentives if applied. Frontier set out the key implications as being:

¹²⁷ "Nothern Powergrid (Northeast) Limited and Northern Powergrid (Yorkshire) plc v the Gas and Electricity Markets Authority", Competition Commission, 29 September 2015, para 4.142

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- An erosion of investor confidence. Stability and predictability of the regime ensures on-going investor confidence and the simulation of behaviours that drive dynamic efficiency. An arbitrary adjustment undermines these benefits and once investor confidence is eroded it is hard to regain and can have market wide impacts.
- Weakened incentives for efficiency and innovation, as future performance would be perceived as affecting future calibrations of the adjustment
- Distortion of incentives to invest as unpredictable return on efficiency initiatives stifles investment

These concerns lead us to position where we are fully supportive of First Economics conclusion that there is a better way of protecting consumers which does not rely on arbitrary adjustments to allowed returns comprising of:

- *“- the setting of challenging price control allowances, which capture for customers current, best practice levels of efficiency in the sectors and then present an evidence-based challenge to companies to keep on improving in the RIIO-2 period;*
- *an appropriate allocation of exogenous risks; and*
- *appropriate economic incentives to improve efficiency and service standards by more than anyone currently thinks is possible, with an equitable sharing of new frontier shift between customers and shareholders if/when it materialises.”*

FQ20. Does Finance annex appendix 4 accurately capture the reported outperformance of price controls?

In its analysis Ofgem have focused on data from RIIO and last set of pre RIIO price controls to justify application of the 50bps outperformance wedge. Ofgem should be mindful of basing adjustments on RIIO-1 performance as final outcomes are yet unknown and have the potential to move significantly post close out of the price control. In addition, First Economics in Section 5 of their report expand the sample size used by Ofgem to review companies out and under performance to allow a broader understanding. It includes:

- earlier versions of Ofgem’s energy network price controls;
- the Northern Ireland Utility Regulator’s price controls for Northern Ireland Electricity’s (NIEs) transmission and distribution business;
- the CAA’s charge caps for Heathrow airport and NATS;
- ORR’s regulation of Network Rail’s revenues; and
- the Water Industry Commission for Scotland’s (WIC’s) charge controls for Scottish Water

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Table 3: Out- and under-performance in price controls

	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Ofgem, GDNs															
Ofgem, TOs															
Ofgem, DNOs															
Ofwat, water companies															
CAA, Heathrow															
CAA, NATS															
ORR, Network Rail															
UR, NIE															
WICS, Scottish Water															

Key:

Green = overall out-performance of the regulator's totex and output assumptions
 Grey = performance broadly in line with the regulator's totex and output assumptions
 Red = under-performance against the regulator's totex and output assumptions

The positions summarised in the table above show a distribution which makes it difficult to align to Ofgem's view that investors will always expect positive outperformance. Performance varies over price controls and across sector with no evidence of systematic outperformance, broader performance data sets show that there have been many instances of under-performance of price controls. Our electricity and gas transmission businesses in RIIO-1 offer evidence of varying performance in a price control with forecast outperformance by electricity but underperformance by gas. This reinforces our view that historical performance is irrelevant for assessing anticipated performance for RIIO-2.

FQ21. Is there any other outperformance information that we should consider? We welcome information from stakeholders in light of any gaps or issues with the reported outperformance as per Finance annex appendix 4.

Ofgem needs to exercise caution in using high level evidence to justify historical performance as a reason for implementing a wedge between allowed and expected returns, as it fails to bring out the positive transformation that RIIO regulation has driven for consumers. Strong efficiency incentives coupled with a sharp focus on delivering outcomes that consumers want has driven improved service levels and reduced unit costs which are driving lower bills now and will continue to do in the future as those savings are embedded into the efficiency frontier.

RIIO opened three new areas for efficiency improvements which have been relevant in our performance under RIIO-1:

- An eight-year control means that there is greater scope for efficiency improvements to be delivered (those that can be implemented and pay-off within eight years will be a superset of those that pay-off within a five-year control period). As there had been several opportunities to identify and address the business improvements that could be delivered with a five-year period during the previous RPI-X controls, a new eight-year control would be expected to result in a step change in efficiencies.
- The equalisation of capex and opex exposures in the RIIO totex mechanism approximately doubled the incentive to find capital efficiencies compared to RPI-X controls and this would also be expected to drive a step change in efficiency.
- The revised network innovation incentive (in which consumer funding of associated R&D costs was increased to 90%) was intended to significantly increase R&D activity with some benefits (at least 10% of costs) to be expected within period.

As such we believe there are reasons to expect companies to improve performance under RIIO which would mean networks would not necessarily be expected to be distributed around the normal return used in the ex-ante target setting.

Financeability questions

We agree with Ofgem (para 10.1 of the Sector Specific Consultation) that costs of operating and developing networks include the financing costs they incur, which include the returns for both debt and equity investors. In setting price controls, Ofgem's objective is to reflect its duties under the acts. This includes its principal duty to further the interests of current and future consumers, as well as its other obligations including to have regard to the need for regulated companies to be able to finance their licensed activities. This frequently requires Ofgem to strike an appropriate balance between setting allowed revenues that include a fair estimate of these costs to ensure networks are financeable whilst at the same ensuring that allowed revenues and return are not higher than necessary to keep costs low for consumers.

This balance has not been achieved in Ofgem's proposals because the methodologies for setting the allowed returns materially underestimate both the cost of equity and the efficiently incurred cost of debt. As a result, the proposals will result in allowed revenues which will be too low. The objective of the financial package is to ensure that the major capital programmes required across our networks can be financed, by a combination of debt and equity, as efficiently as possible. Ofgem state in the 'Handbook for implementing the RIIO model' that: -

*"As long as the allowed return, depreciation profile and capitalisation policy are set appropriately and there is consistency in their respective future determinations, the notional company should be financeable"*¹²⁸

However, the finance package proposed by Ofgem contradicts this statement as it does not allow our networks to hit investment grade thresholds for core credit metrics. Instead the proposals seek to make companies financeable through mechanisms which bring cash forward and erode value due in the future to investors, who are already increasingly worried about the recoverability of their investment. Short-term levers should not be considered as a substitute for setting base returns at a high enough level as the financial framework needs to deliver sustainable financeability for networks rather than introducing measures which only postpone the gap into future price control periods.

FQ22. What is your view on our proposed approach to assessing financeability? How should Ofgem approach quantitative and qualitative aspects of the financeability assessment? In your view, what are the relevant quantitative and qualitative aspects?

At its very basic level the financeability assessment is a review of the projected levels of a package of financial ratios against target levels. These levels need to be consistent with those that the credit ratings agencies and the capital markets consider when assessing a credit rating well within the investment grade range. As stated by Ofgem in the framework consultation (para 7.67), network companies are obliged under their licences to take steps to maintain an investment grade credit rating. This ensures networks remains financeable and resilient to financial shocks, with the approach minimising consumer costs over the long term.

As well as ensuring credit worthiness, it is equally important to assess the equity investor package to ensure it supports an investment proposition which attracts investment and delivers consumer requirements. At a fundamental level, there needs to be a combination of cash, growth and returns in any price control outcome. Our investor focus has been on dividend yield and growth which requires a balance between cash recovery and delivery of returns and growth.

¹²⁸ "Handbook for implementing the RIIO model", Ofgem, 4 October 2010, para 12.25

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We understand a fully informed assessment can only be undertaken when business plan submissions are made, but it is imperative that a robust and transparent process is put into place which has regard for both debt and equity investors. As it stands, the consultation provides limited additional detail or clarity on Ofgem's proposal to assessing financeability with paragraph 4.14 stating the intention to issue further guidance including a draft financial model which will contain a suite of financial metrics. We therefore respond to the generalities of assessment as set out in the sector specific consultation and expect to have the opportunity for further comment on the forthcoming publication. With this context, for the aspects of the assessment which have been outlined we set out our position below:

Notional company principles

The onus for ensuring financeability of the actual companies lies with networks. However, the regulator has a duty to have regard to setting a price control at a level which would allow an efficient notional company to finance its licenced activities. Whilst the parameters and particulars of actual companies may be of some interest to the extent that they inform estimates for a 'notional efficient company', the financial parameters (such as cost of debt, gearing, cost of equity, and financial metrics) should be estimated for the notional efficient company.¹²⁹

We agree that Ofgem's assessment of financeability should be based on the notional entity. Actual financing is a matter for the company and consumers should not be expected to pay for any inefficient structures. For example, poor choices which are fully controlled by the network company should not be to the detriment, and therefore by symmetry to the benefit, of consumers. However, this does require balance with the realities of how specific agencies rate the networks. It would be inappropriate to conclude that a financial package is acceptable based on a notional view of how rating agencies might view a regulated network only to find that a very different methodology is applied in practice.

Ensuring investment grade

In line with the Framework consultation, there is again only mention of the licence requirement to be investment grade with no reference to what Ofgem would consider to be a financeable rating for the efficient, notional company. This is reinforced by the proposal to not provide targets for any particular metrics, expecting companies to assess financeability as a whole, including potential company actions. At a minimum, Ofgem must ensure notional assumptions across the capital structure are consistent and that credit metrics ratings align to the index used to set the cost of debt allowance.

The cost of debt indices agreed for RIIO-1 were based on non-financials A rated and non-financials BBB rated companies. We consider these rating levels remain appropriate for RIIO-2 as they achieve the right balance between financial resilience of the network and consumer bill impacts. While credit ratings in the low BBB range are still considered investment grade, they have significantly less headroom to absorb macroeconomic shocks. We consider maintaining a appropriate financial capacity in the credit ratings will be imperative in RIIO-2, particularly given the heightened political backdrop in the UK (Brexit, nationalisation) coupled with increasing competition and lower returns. Furthermore, for credit quality deteriorating below the A range, a narrowing pool of debt investors combined with increasing costs for attracting investment will ultimately drive higher bills for consumers with little added benefit.

¹²⁹ This brings the obvious additional requirement as a direct consequence that these financial parameters must be estimated as a consistent and coherent set and applied consistently across all parts of the price control. For example, as the CC/CMA has recognised in past determinations, the licence holder, if efficiently managed, should be able to earn its cost of capital under the assumed (i.e. notional) gearing, and this requires there to be consistency between the gearing assumed in setting the WACC and in the tax modelling. (see e.g. NIE (2014) para 13.38, and CC Bristol Water (2010) at Annex N para 34) – so like the WACC, modelling of the tax element of allowed revenues needs to be calculated on a notional rather than actual basis.

Credit ratings methodologies

Ofgem has affirmed it will assess financeability drawing on rating agencies' methodologies. Fitch is mentioned in the framework consultation (para 7.67), but their methodology (similar to S&P's) on a notional basis is not clearly defined with equally unclear weightings towards qualitative and quantitative factors. Moody's methodology in contrast is more clearly defined and as such Ofgem has historically favoured their score card approach ("Grid") consisting of both qualitative and quantitative factors.

On this basis, we support application of Moody's Grid but with stress testing of qualitative factors because of their potential to materially influence ratings outcomes. In the past, we have seen the qualitative factors remaining broadly unchanged, but we find ourselves in an evolving political and regulatory landscape, which may affect the outcome of Moody's Grid more than a shift in quantitative metrics.

This provides a reasonable basis for assessment. From this point, we feel it is important for Ofgem maintain a degree of flexibility in its application, as operated by Moody's themselves, to ensure a more complete and appropriate assessment. Particularly key in applying the methodology appropriately will be consideration of the core metrics, the importance of which have previously been ignored by Ofgem, but which can dominate Moody's decisions.

The Moody's Grid is an input to the Moody's Committee rating discussion and is supplemented by an assessment of the core metrics (AICR and Net debt / RAV). These ensure companies' cash flow metrics accurately reflect its assigned rating, which due to the supportive qualitative factors in the Grid can be overlooked. The core metrics, like the Grid, have their own associated indicative rating. This can be more punitive than the Grid outcome, due to the requirement for strong quantitative factors and can ultimately result in a lower overall rating determined by the Committee. Ofgem has previously ignored the importance of the core metrics which are not explicitly defined in Moody's methodology paper.¹³⁰ However, Moody's published the core ratio guidance in their sector report¹³¹ as well as highlighting that guidance can be reassessed. Moody's guidance is based on a level of risk defined by its qualitative features and is reassessed where regulatory changes alter the associated risk profile. This is evident in Moody's adjustment of the water sector ranges, which prior to PR19 were aligned with the regulated energy networks, but now require improved metrics to support a riskier regulatory regime. Core metrics can dominate Moody's Committee's decisions particularly where outcomes are below Grid outcomes. Therefore, it is key that Ofgem are mindful of how the methodology is applied in practice to ensure assessment is consistent with real world outcomes'

Ensuring equity financeability

Whilst the appropriate application of the Moody's methodology will contribute to the improvement of financeability testing, it is still only a single stakeholder view and consideration should be given to others. We consider financeability assessments should be considered in a more holistic approach capturing the ability to efficiently finance investments through both debt and equity. Consequently, it is important to consider financial metrics in the context of assessing the impact of any price control arrangement on equity investors.

For RIIO-1 emphasis was placed on delivery of returns and growth as a way of understanding economic performance due to framework changes introduced by RIIO reducing the stability of earnings. However, feedback from investors in recent years has shown changing requirements as they are beginning to seek out more stable earning profiles as well as adequate cash generation to maintain dividend yield. This is driven by increasing economic uncertainty and the

¹³⁰ "Rating Methodology - Regulated Electric and Gas Networks", Moody's Investor Service, 16 March 2017

¹³¹ "Regulated electric and gas networks – UK Risks are rising, but regulatory fundamentals still intact", Moody's Investor Service, 29 May 2018, page 4

risk against the UK sector being investable because of the pressurised regulatory and political environment. This nervousness is heightened by an environment where Ofgem acknowledge that financeability metrics are likely to deteriorate since returns, and therefore cashflow, are being proposed at levels significantly lower than RIIO-1.

In a world, therefore, of potentially lower returns and increasing uncertainty, more stable earnings profiles and quicker cash recovery are likely to be important to investors. Ofgem previously noted it will consider two key equity metrics (Notional RAV/EBITDA and Regulated Equity/Regulated Earnings) in the original framework consultation. However, they have not noted the weight or issued guidance associated with these. Given investor feedback, we believe that it is also appropriate to refine Ofgem's proposed equity metrics to better reflect IFRS earnings metrics. This ensures a balance of returns and cash recovery in a way which maintains an equitable balance between the needs of investors, current and future consumer. To enable this, we will review the value and mechanism of available financial levers to provide additional clarity for investors and address any financeability concerns arising due to uncertainty of investment programmes, consistent with the approach outlined in our response to FQ32. Without this, lower returns, slow cash recovery and continued earnings volatility will add to investor nervousness and either lead to increased cost of equity in the future or lack of investment, with neither being in the long-term interest of consumers.

FQ23. Do you agree with the possible measures' companies could take for addressing financeability? Are there any additional measures we should consider?

The possible measures companies could take to address financeability issues may be considered appropriate levers but only in scenarios where financial metrics are deteriorating despite revenues being set using a reasonable rate of return. What they should not be are measures to pre-empt financeability issues which force networks to take commercial and financial decisions which they would neither take or need to if returns were set at an appropriate level to support cashflows.

Ofgem, recognising that credit metrics are likely to be constrained, propose (para 10.73) looking at company actions and measures such as the cashflow floor as an alternative to setting a cost of equity which provides headroom in the credit metrics and therefore financial resilience for the networks. What this approach fails to recognise is that these proposals will only bring revenue forward, therefore simply postponing the financeability gap into future price control periods whilst at the same time eroding value due in the future to investors

We accept there may be a choice to be made to achieve the right overall balance of returns and cash recovery in a way which maintains an equitable balance between the need of investors and consumers. However, these measures when used to compensate for a low return only add to investor nervousness. As previously noted, this will inevitably lead to either increased cost of equity in the future or lack of investment, with neither being in the long-term interests of consumers.

FQ24. Do you agree with the objectives and principles set out for the design of a cashflow floor?

We present a combined response to FQ24 and FQ25.

FQ25. Do you support our inclusion of and focus on Variant 3 of the cashflow floor as most likely to meet the main objectives?

We present a combined response to FQ24 and FQ25.

We do not support the introduction of a cashflow floor, nor do we agree that its development aligns to the three main objectives as set out by Ofgem. Ofgem's proposed solution is to advance cash from later periods to make sure companies can meet their debt payments in times

where their cashflow is reduced. But it is not clear that this solution is designed to address market failures which are not anticipated at the time of setting the price control. Instead, it is introduced to address failures in the framework caused by setting returns at too low a level. A better solution is to calibrate the network risk transparently and set a return which is balanced with the level of risk a company carries.

KPMG in their report for the ENA, 'Assessment of Cashflow Floor proposals'¹³² have set out an assessment of the justification and underlying basis of Ofgem's proposed mechanism. We share many of their concerns and will refer to their arguments throughout our response below: -

Objective 1: Strengthen the ringfence and support the creditworthiness of actual licensees in the current low cost of equity environment

- Credit rating agencies are likely to see through a proposal which is looking to trade off loss of long-term value against short-term financeability issues caused by insufficient return. Increasing returns (to adequately reflect network risk) increases cash overall and ensures companies remain creditworthy except in extreme cases, whereas transferring cash between periods does not impact creditworthiness in the longer term. In fact, Moody's view of the cashflow floor mechanism is that it is unlikely to provide the level of credit uplift envisioned by Ofgem framework

*'If a mechanism is eventually devised that successfully removes the need for Ofgem to allow any headroom to financing costs, the credit quality of the sector is likely to be weakened.'*¹³³

- Assuming cost of debt has been set appropriately and is reflective of efficient costs at targeted investment grade, if companies are still not financeable it follows that there may be an issue at the level which cost of equity and/or gearing has been set. Instead of being considered an arbitrary adjustment Ofgem need to ensure that these parameters are set at a level which allows networks to finance their licenced activities with capacity to absorb the risk of downside scenarios.

Objective 2: Protect consumers and bondholders from downside scenarios while leaving shareholders fully exposed to incentives on cost and quality of service

- Rather than providing protection, the mechanism creates intergenerational impacts for consumers when cash is advanced from later periods to alleviate short-term financeability issues. Consumer bills should reflect the benefits consumers receive from networks they use and services they are offered. However, if the cashflow floor is triggered it is likely that charges will no longer be cost reflective as consumers pay more now and potentially less in the future.
- However, short term solutions simply defer issues into the future as it is unlikely that the cashflow floor can improve the financial position of a network on a sustainable basis. Improving liquidity in the short term is not the same as improving financial viability, this can only be addressed by increasing return to reflect the higher risk meaning that consumer bills are likely to rise again.
- Ofgem's proposal is designed to provide protection to debt investors by shifting material risk to equity investors risking the likelihood of RIIO-2 providing a fair return to shareholders. The key concern is the potential for dividend payments to be prohibited. Whilst this could be seen as a riskier investment leading to higher allowed returns, the introduction of the cashflow floor is actually being used to depress cost of equity with no clear rationale as to why this would be the case. What is clear however, is that an

¹³² "Assessment of Cashflow Floor Proposals: Prepared for ENA", KPMG, March 2019

¹³³ "Regulated gas networks – Great Britain, Credit quality likely to weaken in RIIO-GD2 regulatory period", Moody's Investor Service, 14 February 2019, page 11

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unbalanced risk/reward package will be likely to further reduce the attractiveness of investment in the UK energy sector by undermining investor confidence in a rational regulator.

Objective 3: Preserve incentives on licensees to manage their financial structures in a reasonable and prudent manner

- Companies have been strongly incentivised through RIIO-1 to avoid under-performance as they are exposed to the risk of making choices which cause deviation from efficient financing arrangements and structures. Perversely, the cashflow floor could undermine this and result in the adoption of inefficient capital structures, particularly if intercompany interest payments are restricted leading to increased gearing at the Opco level as new debt is raised.
- Introduction of a cashflow floor in this manner assumes companies are in this position due to poor financial management whereas with the proposed financial package it is more likely to be due to insufficient funding through framework. However, even if Ofgem was right, consumers would essentially be supporting networks who are experiencing difficulties as a result of poor performance and their own management decisions leading Moody's to refer to the cashflow floor as a *'bailout mechanism'*.

We highlight the results of KPMG's illustrative example of the impact of the cashflow floor when it is triggered.¹³⁴ Even at the starting point, the base case shows there is limited headroom to manage moderate downside scenarios because of a constrained financial package. Limited capacity means that sustained underperformance is more than likely to trigger the cashflow floor. However, what the analysis shows is that in this scenario a liquidity injection actually results in lower PMICR in the medium term than if the floor had not been triggered. This makes it unlikely that implementation of the mechanism would be termed credit positive by the rating agencies even for the medium term, thus supporting our view that liquidity may be addressed in the short term but cashflows would be reduced in the future, simply shifting the liquidity issue to a later period. This leads us to conclude that the additional cashflow which could be advanced is no compensation for setting a cost of capital which meets Ofgem's duty to have regard to networks' financeability

Corporation tax questions

We note that Ofgem have retained for further consideration the three tax funding options proposed in the Framework Consultation, namely:

- Option A – notional allowance with added protections;
- Option B – pass-through for payments to HMRC
- Option C – the “double-lock”: the lower of notional (Option A) and actual (Option B).

We look forward to engaging further with Ofgem on the appropriateness of these options to ensure that we agree a basis of funding tax that promotes tax legitimacy, provides timely and complete funding, allocates risk and reward fairly between consumers and companies and achieves a balance between accuracy and simplicity.

We set out our view in our response to the Framework consultation that Option C should be withdrawn. This was because a double-lock undermined the RIIO-1 principle that risks or benefits of material tax variances outside the control of the licensee should be shared fairly between consumers and licensees. A double-lock is one-sided and would allocate all the tax risk

¹³⁴ "Assessment of Cashflow Floor Proposals: Prepared for ENA", KPMG, March 2019, Section 7.1.2

to licensees. There is nothing in the Sector Specific consultation that would cause us to change this view and we recommend again that Option C is withdrawn.

We have set out below our further thoughts on Options A and B. However, we consider that the existing RIIO-1 framework without “added protections” does a good job of protecting consumers and promoting tax legitimacy and should be retained as the basis for funding tax in RIIO-2.

Option A

We consider that the RIIO-1 notional allowance calculation is an effective mechanism for funding tax. The cumulative effect of the uncertainty mechanisms is to provide consumers with a high degree of protection on tax.

In our view, the RIIO-1 approach:

- Promotes regulatory legitimacy on tax as the allowance is calculated on a standalone, efficient and notionally geared company basis following Ofgem’s methodology;
- Provides timely funding of tax (although note our comments below on completeness);
- Fairly allocates risk and reward for material uncontrolled tax variances between consumers and the licensee; and
- Strikes the right balance between accuracy and simplicity.

For RIIO-2, we ask that Ofgem review the tax treatment of non-totex incentives. Extending tax funding to cover all incentives would ensure that the tax allowance is “complete” in funding the tax that results from licensed activity. It would also be more consistent with the principle of a post-tax regulatory framework.

The Sector Specific consultation provides for an “added protection” in the form of a re-opener that would give Ofgem the ability:

“to revisit the notional allowances, during the RIIO-2 period or at its close-out, should [they] find that allowances are materially greater than payments to HMRC”¹³⁵

The RIIO-1 framework already includes a Tax Trigger which adjusts revenues upwards or downwards for material tax changes outside a companies’ control. We believe that any residual tax risk that arises from the process of setting taxes on an ex ante basis (e.g. forecasting risk) is a business risk that companies are best placed to manage and, hence, should not be subject to a re-opener.

If Ofgem decides to incorporate a general re-opener for tax; we would caution against:

- a re-opener that would adjust revenues annually when the cumulative effect of those adjustments over the RIIO-2 period may not be material.;
- a one-sided mechanism that deals with outperformance but ignores underperformance in the same way as the proposed Option C; and
- a re-opener that would retrospectively change the basis on which the tax allowance is calculated (i.e. a mechanism which switches a notional basis to a pass-through basis).

Consequently, if a re-opener is introduced, it should:

- operate at the end of the price control period;
- adjust for outperformance and underperformance; and
- amend the tax allowance calculation within the RIIO-2 financial model to reflect changes against specified forecast assumptions (e.g. allocations of expenditure to tax pools).

¹³⁵ Reference para 5.14 of the Finance annex

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This assumes a Tax Trigger is retained to adjust for material tax changes outside a company's control.

Option B

The theory of a tax pass-through appeals as it could:

- Promote tax legitimacy by removing any scope for outperformance and giving consumers certainty that they were funding no more tax than licensees were paying;
- Provide a more complete funding of tax; for example, tax on incentives would be automatically funded (although note the comments below on timeliness); and
- Allocate risk and reward for tax variances (including forecasting risk) automatically between consumers and the licensee without the need for uncertainty or re-opener mechanisms.

Our concern with Option B is that whilst it sounds appealing, there are practical challenges. Primary amongst these is the break from the principle of the standalone, efficient and notionally geared company if the tax allowance shifts from the Ofgem model to the Corporation Tax return.

This would require complex reconciliation work to unbundle items that would ordinarily sit outside Ofgem's financial model. There are several legitimate variances between actual tax costs and the notional allowance including unlicensed activity, intra-group balances (e.g. group relief), differences between notional and actual gearing levels and actual and notional interest costs and costs that sit outside the base revenue setting process. As appealing as Option B sounds, it would likely result in an iterative process to calculate a proxy for "Ofgem actual tax".

Furthermore, to ensure that tax funding is provided on a timely basis and to address the fact that actual tax may not be settled until after the end of the year in which the tax has been paid, some form of ex-ante allowance would be required which would need adjusting ex-post once the Corporation Tax return has been filed.

We would also caution that breaking the link to the standalone, efficient and notionally geared company could create consumer fairness concerns about how risk is being allocated. For example, a company might retain the benefit of an interest outperformance whilst consumers paid the resultant increase in tax arising from the reduction in actual interest costs.

Ultimately the concern is that Option B would add complexity and skew risk without delivering the hoped-for legitimacy gains.

FQ26. Do you support our proposal that companies should seek to obtain the "Fair Tax Mark" certification?

In considering the Fair Tax Mark, we need to be clear what the mark achieves and the nature of the certainty that it provides consumers.

The Fair Tax Mark focuses solely on Corporation Tax. This is a relatively small part of the total taxes that we pay as a group and that proportion is expected to fall further as the Corporation Tax rate reduces to 17%. The concern is that, notwithstanding its name, the mark does not give consumers the complete picture on tax.

We also note that the mark is focused on tax at the statutory group level, which for National Grid includes non-UK and non-regulated businesses. It would not necessarily provide consumers comfort that the tax allowance calculation at the regulatory level is "fair" or that licensees are not outperforming on tax (or that any outperformance is being reinvested "fairly" on behalf of consumers).

What constitutes the "right amount of tax" must be determined by HMRC. Whereas we support fairness, we consider that companies should be incentivised to manage tax appropriately and in the interests of consumers and licensees alike. An incentive to negotiate uncertain tax positions

with HMRC and to maximise reliefs and incentives that the government has chosen to make available to investors in UK infrastructure must be retained. This should be unconstrained by concerns around how fairness might be scored.

In our view, the RIIO-1 tax framework does a good job of promoting tax legitimacy and the decision on whether to supplement this further by seeking the Fair Tax Mark should be for companies to take at their own discretion.

FQ27. Is there another method to secure tax legitimacy other than the “Fair Tax Mark” certification? Could we build upon the Finance Acts (2016 and 2009) with regards to the requirement for companies to publish a tax strategy and appoint a Senior Accounting Officer?

We consider that the RIIO-1 tax framework does a good job of protecting consumers. When viewed as part of a broader package of measures including the statutory requirement for large businesses to publish a tax strategy and the increasing trend for reporting on total tax contributions, companies are well positioned to engage positively with consumers and stakeholders on tax legitimacy.

The introduction of a general tax re-opener would help to further promote tax legitimacy although we would caution whether the incremental legitimacy gain would outweigh the additional complexity.

FQ28. For Option A, how should a tax re-opener mechanism be triggered? Is there a materiality threshold that we should use when considering the difference between allowances and taxes actually paid to HMRC? If so – what might this be?

As the existing Tax Trigger mechanism targets unforecastable risks outside of a company's control, a tax re-opener would be principally targeting forecasting risk (i.e. general tax risk that arises from the process of setting taxes on an ex ante basis). We consider this is a business risk that companies should bear and is not a circumstance requiring a re-opener.

If a re-opener is introduced, its design would need careful consideration. As an outline, we would suggest that it should

- operate at the end of the price control period;
- adjust for outperformance and underperformance; and
- amend the tax allowance calculation within the RIIO-2 financial model to reflect changes against specified forecast assumptions (e.g. allocations of expenditure to tax pools);

This would be consistent with a re-opener targeting forecasting variances. It would also preserve the standalone, efficient and notionally geared company basis and avoid some of the concerns we have identified around Option B.

A period end re-opener could operate automatically at the end of the price control period albeit revenues might only be adjusted if the variance in respect of any single year was material. To ensure consistency with other tax uncertainty mechanisms, a general re-opener should adopt the same basis of materiality as the Tax Trigger.

Consideration would also need to be given as to whether the materiality threshold would operate as a dead-band and, if triggered during the re-opener review period, how the re-opener might interact with the Tax Trigger.

RAV indexation (CPIH) questions

FQ29. What is your view on our proposal for an immediate switch to CPIH from the beginning of RIIO-2 for the purposes of RAV indexation and calculation of allowed return?

We support the proposal to move from RPI to a consumer price based index as we note that RPI has been subject to recent criticism and that this places pressure to seek an alternative index from a legitimacy point of view. We also support an immediate switch as the least complex mechanism to enact but the consumer bill impact of this approach should be tested with stakeholders through the constructive engagement process.

Ofgem currently intend to switch to CPIH indexation, but to use CPI forecasts as a proxy for expected CPIH because of the absence of any credible independent forecasts for CPIH. This will only be reasonable if it can be assumed that on average there will be no differential between CPI and CPIH. This may not be the case. Therefore, it would be more transparent for indexation to be switched from RPI to CPI (rather than CPIH), until such time that meaningful, credible and independent forecasts of CPIH are published (e.g. by OBR or BoE) and these have established a suitable track record. We therefore agree that the specific index should be assessed closer to finalisation of the price control based on the availability of the financial instruments at the time.

With that context, in principle, we support the immediate switch to CPIH from the start of the RIIO-2 period as it reduces the reliance on the availability of RPI indices during the price control period.

An immediate switch is preferable to a phased implementation as it creates greater transparency for investors and other stakeholders on a complex subject; for example, it would not require the complicated transitional arrangements that Ofwat have put in place. Working out the 'right' answer will be more intuitive as transition would add complexity to other areas of the control with a risk of loss of value. For example, RPE calculations would be much complex, particularly when a tracker is involved. It would also be simpler to mechanically implement an immediate switch throughout the regulatory framework.

Although we support full transition to CPIH from the start of the RIIO-2 period, we recognise a phased transition would reduce the step change in the consumer bill profile. However, whilst this would create an arbitrary intergenerational impact, subsidising current consumers at the expense of future billpayers, we will test the impact of the change with our stakeholders within our constructive engagement process. This will allow informed views on this topic to be gathered and determine the precise transition profile ensuring consumers' bills reflect stakeholder impact.

FQ30. Is there a better way to secure NPV-neutrality in light of the difficulties we identify with a true-up?

We support an immediate switch to CPIH, for the reasons we have outlined in our response to FQ29 and agree that trueing up creates complexity and inconsistency with cost of debt and cost of equity methodologies. Whilst we are fully supportive of creating transparency, we are also cognisant that this needs to be balanced with ensuring transition is neutral for investors. Key to maintaining investor confidence will be implementing and managing a transparent process

We welcome Ofgem's commitment to ensuring '*... consumers and investors as a whole will be neither better nor worse off in net present value terms*' (para 6.101, RIIO-2 Framework decision) and note Ofgem included an illustrative example in Appendix 2 of the Framework Decision which demonstrates the cash flows for a hypothetical asset using an RPI or CPIH framework are NPV neutral. However, we are concerned with the narrow scope being considered which is limited to the rate of RAV growth and the profile of returns allowances. Investors value certainty and significant concerns remain as to whether their investment stays neutral or erodes value under CPIH indexation, both from managing the complexity of the range of mechanism where RPI indexation is used currently, but also managing the areas where value could be unintentionally lost (e.g. RPI indexed pay deals, pensions, cost of financing).

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To ensure value neutrality Ofgem must demonstrate it has considered the other areas of the framework which are impacted by the transition:

Adjustment to allowed return

To ensure value neutrality, real allowed return needs to be adjusted to bring it in line with a CPIH index to ensure investors can earn the same nominal rate of return. This impacts both cost of equity and cost of debt. Considering cost of equity first, Ofgem's proposed approach to determine real TMR is based on the line of reasoning that investors rely on the prevailing official measure of inflation in forming their view of real returns. On this basis Ofgem equates CPI-stripped real return to the RPI-stripped value underpinning previous controls meaning that transition from RPI to CPI does not maintain value neutrality.

Ofgem's proposed approach to adjust cost of debt also makes it difficult to maintain value neutrality. Ofgem's preferred method to calculate the real cost of debt allowance is to continue to use RPI breakeven inflation than adjust by a measure of an expected wedge between CPIH and RPI headline measures. The issue with this approach is that assuming a wedge adds further forecasting risk on top of that already inherent in RPI indexed price controls when deflating cost of capital components.

We outline in our responses to FQ4, FQ8 and FQ9, the steps Ofgem should take to ensure that adjustments to determine the allowed return achieve value neutrality.

Financeability Implications

We are clear that transition to CPIH should not be used as a lever to address financeability issues that may be caused by setting returns at a level which is too low. We would therefore expect financeability assessments on both a RPI and CPIH basis to be able to test value neutrality. This will be important in understanding the long-term implications of the switch, particularly when future funding will reflect CPIH but a significant proportion of costs are likely to remain nominal or RPI linked creating a mismatch between revenue and costs.

Totex allowances

Where RPI is more closely correlated with specific elements of network costs, companies are more likely to plan their expenditure and funding in terms of RPI. To ensure value neutrality Ofgem need to ensure that nominal allowances are not affected by changing indexation measures. A move to CPIH means cost assessment models will need to capture underlying real price pressures to reflect the change of index with any switch accompanied by higher real price input allowances than would be the case under retention of RPI indexation.

Additional costs

For the change to be value neutral to investors, Ofgem need to recognise any additional costs associated with the change to CPIH. Without stable, liquid and significant CPI linked debt market financing costs could be higher as CPIH linked products will be more limited than other debt instruments currently available to the industry. This should be factored into Ofgem's assessment of cost of debt allowances. Consideration should also be given to the loss of the natural RPI hedge for networks financed with RPI index-linked debt.

Implementation Risks

Specific mechanisms which will create complexity include: -

- **RAV true ups:** The final value of the RAV will not be known until after RIIO-2 has started. It is key therefore that the true-up value is treated in a manner consistent with the

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transition approach and price base applied to the brought forward balance as opposed to treated as an addition.

- **2-year lag for MOD:** Performance impacts revenues with a 2-year lag, therefore the subsequent MOD term calculated in RIIO-2 relating to RIIO-1 could have different indexation compared to that used in charge setting.
- **Legacy True-Ups:** (e.g. excluded services): Legacy true-up mechanisms will need to be indexed consistent according to the price base and method of incorporation into the RIIO-2 framework.

Despite highlighting these as areas we think Ofgem need to consider to ensure value neutrality, given the complexity of the framework, PCFM calculations and licence mechanisms, and the numerous ways in which RPI is currently used in these there is still clearly a risk that not all the changes needed are fully captured. To mitigate this risk we would support Ofgem in carrying out a full impact assessment to ensure all areas are captured, allowing the impacts of the switch to be clearly communicated to all stakeholders including investors and consumers.

Regulatory depreciation question

FQ31. Do you have any specific views or evidence relating to useful economic lives of network assets that may impact the assessment of appropriate depreciation rates?

We support a review of the regulatory depreciation profile parameters to ensure consistency with the assumptions and scenarios underpinning the networks' business plans. We will therefore address this framework area in detail within the context of our business plan submissions.

We agree with the general principles set out by Ofgem within the Finance annex of the consultation, specifically that the depreciation charge should reflect the benefit consumers derive from the network services they receive and have regard to intergenerational fairness of the associated charge (para 7.7). As stated in our response to Ofgem's framework document, we will also engage with our stakeholders to gain their view on whether a change to the current depreciation rates could minimise risk to future consumers.

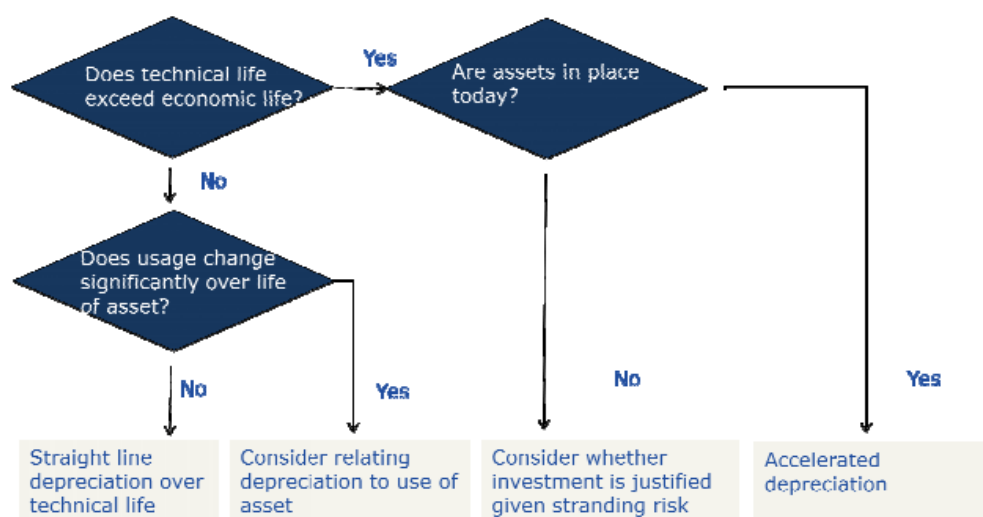
We also agree that the regulatory depreciation of the RAV does not correspond to a physical asset base but rather to the network's unrecovered financial investment and retained performance (para 7.5). However, whilst not directly linked to physical assets, the technical and economic lives of the current asset base provide a useful reference against which to review the regulatory depreciation profile.

The methodology used to assess regulatory depreciation profiles outlined at para 7.12 of the Finance annex seems a reasonable approach which is broadly in line with our proposed procedure as detailed below:

- Understand future demand scenarios to inform potential economic life of the physical assets
- Review the technical and accounting asset lives and depreciation profiles of the current asset base
- Reference to the methodology as set out by CEPA et al.¹³⁶ (and reproduced below) prior to the implementation of RIIO-1 as an initial tool to identify alternative regulatory depreciation profiles of the RAV.

¹³⁶ The Economic Lives of Energy Network Assets – A Report for Ofgem, Cambridge Economic Policy Associates Ltd, Sinclair Knight Merz, GL Noble Denton, Section 2.2.3, page 7, Fig 2.1

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- Test the correlation of the alternative depreciation scenarios against the technical and accounting financial asset lives
- Assess the consumer bill impact under the range of depreciation and demand scenarios for both value impact and appropriate reflection of the intergenerational benefit derived from the assets
- Should the above process result in a proposal to change the current asset life and depreciation profile, we will further consider the impact of the timing of any change on the RAV stranding risk

We are currently anticipating that this methodology could be applied to individual asset classes as well as an aggregated view as deemed relevant. The impact of the asset life and depreciation profile assumptions will be further tested through the financeability assessment.

We have carried out preliminary work in this area and present our initial view. This comes with the caveat that further development of our business plans and stakeholder engagement is required to develop our final view which will be presented in our final business plan submission. The remainder of the response to FQ31 is either NGET(TO) or Gas Transmission Owner specific as stated.

NGET(TO)

We have carried out an initial high level review of asset life data.

The Future Energy Scenarios 2018 (FES18), published by National Grid Electricity System Operator, includes four scenarios all of which indicate that the economic life of the electricity network and assets is not forecast to decline prior to 2050, being the limit of the timeline used in the report.

Furthermore, based on a preliminary review of the technical life of the Electricity Transmission Owner assets in situ as at January 2019, the technical life is similar to the regulatory asset life of 45 years which will be applicable for RAV additions from the final year (2020/21) of the RIIO-T1 period.

Our preliminary conclusion is that there is no clear evidence that technical life will exceed the economic life of NGET(TO)'s physical assets. There is also no anticipated change in the use of the assets for at least the next six price control periods (assuming a five-year price control). We will review our initial assessment and carry out further analysis as required during development of the business plan. However, our initial view is that we are unlikely to propose a change to the current regulatory asset life and depreciation profile being a straight-line depreciation over 45 years.

NGG

We stated in our response to Ofgem's Framework consultation that

"Maintaining the option to further consider asset lives would also provide an opportunity to review the alignment of Gas Transmission regulatory depreciation profiles with the sum of digits approach applied within the Gas Distribution frameworks."

We have since reviewed the existing asset life data for the Gas Transmission Owner's physical asset base. The results give an early view of our likely conclusions regarding regulatory depreciation life and profile. This is, of course, subject to further revisions as we continue to develop our business plans and engage with stakeholders. Our review at this stage has been limited to the Transmission Owner assets and does not cover the Gas System Operator depreciation approach.

We note that investment profile in the gas transmission network has changed over the previous price control period according to customer requirements and network usage. For example, in the TPCR4 price control, investment in load related spend, which mainly related to pipework installation, formed approximately two thirds of our total capex spend¹³⁷ compared with less than 10% for the RIIO-T1 period as based on our Regulatory Reporting Pack submission in July 2018.¹³⁸ Within RIIO-T1, the significant proportion of investment is to maintain the existing network and ensure it continues to be compliant with changing environmental legislation. Given that the technical life varies significantly with the type of asset, rather than look at the asset base as a whole we intend to consider depreciation data by asset category. An initial review identifies that pipeline assets have a technical life in excess in the current regulatory asset life of 45 years. However, the technical life of other asset categories excluding pipelines is significantly less with an average at around 25 to 30 years and some assets (such as those related to physical security) have lives of around 10 years.

In terms of the economic life of gas transmission assets, the FES18 demand scenarios indicate a decline in the gas consumer numbers over the next 30 years in each of the four scenarios, albeit the decline is more pronounced in some scenarios. The usage profile could also undergo significant change depending on the actual scenario that outturns. This raises two issues; a potential intergenerational mismatch between asset usage and the charge incurred and an increase in RAV stranding risk.

Based on this early view, it seems likely that the technical life of the assets will exceed their economic life and furthermore, that this difference will vary significantly according to the type of investment whether past or forecast.

Our intention is therefore to assess the regulatory depreciation profile for individual categories of investment:

- Pre RIIO-T1 investment is composed primarily of spend on new pipelines to meet the entry and exit requirements of customers. For example, as stated previously, 80% of spend within the TPCR4 price control fell within this category. As such the technical life of the asset base is in excess of 45 years. From a regulatory perspective, the pre RIIO-T1 asset base will be fully depreciated by 31 March 2058. Based on the FES18 scenarios the economic life of the assets will be lower than both the technical and the regulatory life. Our preliminary conclusion is that a 45-year straight line depreciation of this proportion of the RAV remains materially appropriate.
- RIIO-T1 additions to the RAV comprise 39% of asset health and compressor work which has an approximate technical life of 20 years. However, the average technical life of capex spend within the price control period is forecast to be 25 to 30 years, the uplift mainly due to the longer technical life of the Feeder 9 pipeline. On first investigation, the

¹³⁷ Transmission networks : Report on the performance of Transmission Owners during the regulatory periods TPCR4 and TPCR4RO, Ofgem, 21 March 2014, para 4.30, Figures 28 and 29

¹³⁸ The value of less than 10% includes spend for the Feeder 9 tunnel and pipeline even though this is categorised as non-load spend with the relevant reopener mechanism.

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asset life and economic life seem broadly aligned at 30 years. Our expectation at this stage of our business plan development is that a reduced regulatory asset life will be more reflective of future consumer usage profiles, average asset technical lives and will reduced RAV stranding risk. We will continue to analyse the data in this area and will apply the further methodology steps outlined above to assess the consumer bill impact both in RIIO-2 and beyond and the risk of delaying such a decision to future periods.

- Should trends continue it will be unlikely that load related spend forms a significant proportion of our investment in RIIO-2. The technical life of the assets is therefore expected to be significantly lower than 45 years, more in line with that of the RIIO-T1 period. It would therefore be consistent to apply a similar reduction in asset life to the RAV additions within the RIIO-2 period. However, given the that the investment is made later within the timescale considered in FES18 the RAV stranding risk is considerable higher. Therefore, our preliminary indications are that both a reduction in the 45 year asset life and a weighting of the depreciation profile towards earlier years through adoption of a sum of digits approach is required to match consumer benefit to charge and to manage the stranding risk. The sum of digits depreciation profile was adopted by the gas distribution networks in RIIO-1 so adoption by gas transmission would result in a consistent approach across the gas sector implying alignment of underlying assumptions of the future role of the gas network.

The decline in demand as observed in the FES 18 scenarios may also result in requirement to decommission assets as they become redundant. We also decommission assets as they come to the end of their technical life either due to legislative requirements or following a cost benefit exercise where the cost of maintaining the asset is shown to be greater than the costs of decommissioning. The gas transmission regulatory precedent is to treat decommissioning spend as capex, effectively as a RAV addition and therefore future consumers fund this cost. If this approach is continued for RIIO-2 the stranding risk could increase. Adopting a sum of digit depreciation profile as discussed above will minimise the associated risk.

We reiterate that these analyses and conclusions are arrived at prior to finalisation of our business plan submissions or completion of the stakeholder engagement process. We include this information in our response to illustrate the issues that we will be considering in this area of the framework and advise Ofgem that we will finalise our views at a later date.

Capitalisation rates question

FQ32. Do you agree with our proposed approach to consider capitalisation rates following receipt of company business plans?

Consistent with our response to Q43 of Ofgem's Framework consultation, we support Ofgem's proposal to consider capitalisation on receipt of company business plans. We interpret this as Ofgem using the July business plan submission to inform initial discussions with networks with the position finalised post the December business plan submission.

As we previously noted, a review of the value and mechanism is an opportunity to provide additional clarity for investors and to address any financeability concerns arising due to uncertainty of investment programmes. We also propose that this remit is broadened to encompass a review of the underlying asset categorisation, for example treatment of decommissioning costs, which may impact the determination of the appropriate capitalisation rate.

We first identify a difference in the capitalisation rate mechanisms applied to gas Transmission and NGET electricity transmission within the RIIO-1 frameworks. The NGET(TO) framework uses a single capitalisation rate for all spend and network retained share of performance with its basis in the average opex / capex proportion submitted in RIIO-1 Final Proposals. Whilst the gas transmission framework used a similar approach for expenditure on outputs originally captured

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in the baseline plan, spend within an uncertainty mechanism was subject to a separate capitalisation rate reflecting the higher proportion of capex likely to be incurred.

We have carried out an initial review of the impact of a split versus a single capitalisation rate and reference this against the balance between accuracy versus simplicity (para 11.3, RIIO-2 Sector Specific methodology). We have also taken account of investor feedback regarding preference for a transparent price control framework which does not introduce unnecessary volatility. We conclude that a single capitalisation rate for each of NGET(TO) and gas transmission is favourable due to the simplicity of application and explanation. Use of a split rate does not necessarily introduce greater accuracy and adds additional complexity to the framework without significantly reducing earnings volatility.

In the course of our review, we have identified that revising final outputs and associated allowances as determined under Final Proposals only in the year in which the output was originally intended to be delivered is the key contributor to earnings volatility. We propose that the price control framework allows for forecasting of outputs in order to better match allowances with costs as incurred to reduce revenue volatility, a priority highlighted by through our customer and investor engagement programmes. Forecast data is available from the regulatory reporting process which requires networks to submit output, allowance and cost forecast data for the full price control on an annual basis. A design that would allow these mechanisms to work on a foresight basis, as opposed to when output is delivered or due to be delivered, could make allowance more stable and strike a better balance between predictability and stability of charges. Since the benefits could be large, this is an area where more complexity could be justified.

We have commenced a review of the consistency of the asset categorisation from a regulatory perspective as compared with spend profiles, consumer usage of assets and the intergenerational effect and statutory accounting treatment. We will present the conclusions from our review in our July Business Plan submission

Ofgem also refer to assessment of the implementation of IFRS16 (para 7.15 of the Finance annex). The new standard will impact accounts for networks that currently uses IFRS or use FRS101 rules to prepare its accounting records. It will not impact networks reporting under FRS102. Currently NGET and NGG report using FRS102 but given the divergence in accounting standards we are considering using FRS101 to align to National Grid Group and UK Consolidated Accounts. IFRS16 implementation commences for accounting periods commencing on or after 31 December 2018, which for National Grid will be the 2019/20 financial year with the first regulatory reporting submission being July 2020.

Under the current leasing rules (IAS 17), lessees account for a lease as either an operating or as a finance lease. IFRS 16 requires lessees to recognise all leases on the balance sheet based on whether there is an identified Right of Use Asset (ROU) in the agreement. The result of recognising all leases on balance sheet requires an increase in assets and liabilities, as well as changing cost recognition in the income statement, moving costs from operating expenditure (rent expense) to depreciation and interest expense. Therefore, under the current regulatory rules a new ROU asset lease would be included in totex as an in-year capex addition with a subsequent impact on the capitalisation rate used to calculate RAV additions. This would apply to both finance and operating leases under IFRS16.

We propose that the current regulatory treatment should be applied to finance leases where the network will take legal ownership of the asset but should not apply to ROU assets where the network does not take legal ownership of the asset. The proposal to diverge from accounting records for operating leases is to avoid the upfront asset recognition being treated as capex. Instead, we propose that Ofgem should fund the cash outlay by including the actual cash payment to the lessor as opex in the definition of totex.

Ofgem would need to design this requirement into their business plan templates to ensure consistency across networks. We envisage a mechanism similar to funding provision utilisation (cash). The templates should exclude ROU lease interest costs from the regulatory definition of financing costs, exclude ROU lease obligations from the regulatory definition of net debt and

show differences between accounting and regulatory treatment as part of income statement to totex reconciliation.

Notional gearing question

FQ33. Do you have any comments on the working assumption for notional gearing of 60%, or on the underlying issues we identify above?

In developing the RIIO-1 framework, Ofgem noted the balance and consistency to be achieved between the riskiness of the cashflows, notional gearing and equity beta was dependent on individual company circumstances and that notional gearing could therefore not be determined until post business plan submission.

We support the RIIO-2 Sector Specific Consultation proposals which are consistent with this approach in that networks' assessment of risk and notional gearing are to be based on business plan submissions.

In testing notional gearing assumptions, we will take account of:

- the cashflow volatility based on an analysis of the network's business risks,
- the financeability of the notional company,
- consistency with the gearing ratios assumed by credit rating agencies for particular ratings,
- the implications for the notional RoRE ranges,
- comparison with previous price control period to reflect the value that investors' and stakeholders' place on consistency of regulatory determinations, and
- actual gearing levels.

These criteria are consistent with those set out by Ofgem at RIIO-1 as relevant evidence to support companies' notional gearing proposals.

In the intervening period to final submission, Ofgem have proposed that networks use a working assumption for notional gearing of 60%. This compares with the notional gearing range of 65% to 50% assumed in CEPA's review of cost of capital on which the 3% to 5% cost of equity range in Ofgem's Framework document was based.¹³⁹ CEPA's justification for this was that the low end was drawn from evidence on regulated utility gearing and the higher gearing value was based on previous regulatory decisions. No further rationale was set out for the application of the higher gearing to the lower end of the cost of equity range and vice versa. Applying the notional gearing working assumption to CEPA's original cost of equity calculation results in a 2.5% to 6.5% cost of equity range.

The change in notional gearing assumption combined with Ofgem's reliance on a different single source for the beta assumptions at the Framework and Sector Specific consultation caused a change in the headline range to 3% to 4%. The change in gearing assumption and associated impact on the equity beta calculation is not addressed by Ofgem and there is also no transparency or validation for the resulting narrowing of the cost of equity range.

¹³⁹ Review of Cost of Capital Ranges for Ofgem's RIIO-1 for Onshore Networks, Cambridge Economic Policy Associates Ltd, February 2018, section 7.1, page 71

Notional equity issuance costs question

FQ34. Do you agree with our proposed approach to consider notional equity issuance costs in light of RIIO-2 business plans and notional gearing?

We support assessment of notional equity issuance costs in conjunction with RIIO-2 business plans and notional gearing. However, there are two principles which we would expect to be agreed prior to business plan submission.

The equity issuance mechanism is designed to replicate the costs associated with raising additional equity and takes effect when notional gearing exceeds an agreed threshold. The assumption within the RIIO-1 framework is that equity issuance costs are equal to 5% of the equity being issued. We will reassess an appropriate level for equity issuance costs consistent with the final RIIO-2 financial package in our business plan submission.

As set out in our response to FQ33, we will assess an appropriate level of notional gearing consistent with our business plan and informed by the cost of equity and cost of capital. Dependent on the other financial parameters applied, this may result in a significant change in notional gearing from current levels to result in a financeable plan. In this case, alignment of actual gearing with the notional level will require additional debt or equity issuance both of which will result in additional funding costs. We will assess the impact of these costs and will include these in our business plan.

Pension funding question

FQ35. Do you agree that for RIIO-2 we align transmission and gas distribution with electricity distribution and treat Admin and PPF costs as part of totex?

We welcome that Ofgem have re-affirmed their commitment to consumer funding of deficits in defined benefit pension schemes, (para 10.43 in the main consultation document). We also welcome Ofgem's confirmation that the next triennial review of the established deficit pension allowance will be completed in November 2020 in accordance with Ofgem's established PDAM timetable, and will sit outside of the RIIO-2 price control review (para 7.2).

However, we do not agree with the proposal for RIIO-2 to bring the treatment of Scheme Admin and pension protection fund (PPF) costs for transmission (and gas distribution) into line with that for electricity distribution.¹⁴⁰ The remainder of our response focuses on transmission networks although we consider it applies equally to the proposals for the gas distribution networks.

The retention of the existing arrangement for electricity and gas transmission that provides for a separate Scheme Admin and PPF allowance reviewed triennially outside of the RIIO-2 price control creates better targeted incentives which are more likely to lead to a better overall outcome for consumers. We have previously raised our concerns to Ofgem in this regard (see National Grid's response of 26 October 2017 to Ofgem's Provisional Revised Pension Allowances Letter). Explicit review and comparison of these costs against a specific allowance has been successful at containing Admin and PPF costs, to the extent that they are controllable. This is evidenced by the per member Admin costs of the National Grid UK (NGUK) Pension Scheme in the year to March 2016 being £137 lower than the RPI adjusted average running cost for very large schemes reported in The Pensions Regulator's DB Scheme Cost Comparison Report.¹⁴¹ The comparable figure for the National Grid Electricity Group of the Electricity Supply

¹⁴⁰ In RIIO-1, Pension Scheme Administration and PPF Levy costs are treated as part of totex for Electricity Distribution, whereas in Electricity Transmission (ET), Gas Distribution (GD) and Gas Transmission (GT) have separate allowances for Admin and PPF costs.

¹⁴¹ See "Table 3.4 – Total cost per member, by scheme size" in "Defined benefit (DB) scheme running cost research" of April 2014 prepared for The Pensions Regulator by IFF Research.

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Pension Scheme in the year to March 2016 is £36 lower than the same RPI adjusted average cost for very large schemes.

It would be instructive if Ofgem were to provide comparable figures for the scheme running costs for ED network operators, provided that it could be demonstrated that any totex-incentivised reduction to ED scheme running costs remains optimal to overall scheme liabilities and appropriate to members' long-term interests. We point out below that some low-cost strategies could well prove to be sub-optimal and deleterious to established deficits and consumers' interests.

Although totex incorporates a cost containment incentive via the overspend / underspend sharing mechanism, the loss of an explicit, transparent allowance for each network, coupled with a reasonableness review process as is currently the case for electricity and gas transmission, results in a less targeted incentive to contain those elements of Admin and PPF costs that are controllable to a limited extent. This does not serve consumers' best interests.

Categorisation as totex and application of the totex incentive mechanism is inappropriate for these costs. There is limited ability to directly control significant parts of both Scheme administration and PPF levy costs, given that certain minimum costs must be incurred under Pension Scheme regulations and, in relation to PPF costs, are set and invoiced directly by the Pension Regulator. Also, administration costs are outside of the direct control of the pension scheme sponsor given that scheme administration is the responsibility of trustees, and in addition the level of costs will depend on many details of each individual scheme, including its size and its investment and risk management strategies. In this respect, retaining the existing pass-through mechanism with directly set allowances is more consistent with Ofgem's general approach to non-controllable costs.

Where elements of Admin and PPF can be controlled (albeit to a limited extent as explained above), we believe that the experience of RIIO-T1/GD1 demonstrates that the existing non-totex approach has been effective at limiting costs. More importantly, consumers' interests are best served if these costs are optimised rather than minimised. The existing approach in transmission and gas distribution will better incentivise this outcome than if Admin and PPF costs are included in totex, which could be expected to incentivise networks to encourage trustees to minimise these specific costs, even though this could well increase the level of established pension deficits funded by consumers. For example, more sophisticated de-risking approaches are becoming available and are likely to become increasingly important as pension schemes approach a position of full funding. These approaches could significantly benefit consumers through reduced established deficits and/or reduced risks of future deficit increases in the longer-term, but will increase admin costs, albeit by an amount which will frequently be small relative to the potential beneficial impacts on deficit costs and risks. Clearly, it would not be in consumers' interests to discourage networks and their pension schemes from exploring and implementing such strategies, by including admin costs within totex.

Similarly, following a High Court Guaranteed Minimum Pension (GMP) Equalisation ruling in October 2018, all pension schemes are required to equalise their GMP pensions using one of a number of methods. If scheme trustees are incentivised to opt for the lowest cost method, this could well prove to be a sub-optimal solution that risks increasing pension scheme liabilities and established deficits in the long-term.

Departure from the current allowance methodology will result in loss of transparency of information. This is because specific allowances are better able to take account of each network's individual circumstances, and can then be compared to actual costs and if appropriate can be reset alongside the established deficit allowances at each triennial Reasonableness Review. In contrast to the Electricity Distribution framework, the past pension liabilities for Gas Transmission and Gas Distribution are not spread evenly across the Network Operators. Due to historic network sales without associated pension scheme liabilities transferring to the new owners, certain licensed forms of control bear a disproportionate amount of historic scheme liabilities and associated Admin and PPF Levy costs. Because of the complex history of liability and admin cost transfer from Gas Distribution to Gas Transmission on the sale of some Gas

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Distribution networks in 2005/06, it may be more difficult to take account of these historic differences when setting overall totex allowances than if separate allowances continue to be set for these costs. In addition, any comparison of overall totex levels could become distorted by inclusion within totex of a category of costs which is not comparable across the networks. For example, the four Cadent Gas distribution networks carry the full scheme administration costs associated with all of its liabilities, unlike the Northern, Southern, Scotland and Wales & West gas distribution networks which only carry a proportion of their full scheme administration costs, because the NG Gas Transmission TO licensee historically inherited the remaining costs.

We do not believe that the loss of transparency best serves the interests of consumers.

The current regime of setting specific Admin and PPF allowances separately for each licensed form of control appropriately allows for individual scheme circumstances and history in a transparent and explicit way.

In summary, it is in both consumers' and scheme members' interests to incur pension scheme administration costs in a way that manages overall scheme liabilities optimally. Including these costs within overall network totex risks diluting the incentive to ensure that they continue to be managed effectively. Instead the existing RIIO-1 approach for transmission and gas distribution should be retained.

Directly Remunerated Services question

FQ36. Do you have any views on the categories of Directly Remunerated Services and their proposed treatment for RIIO-2?

We agree with Ofgem's policy intent to avoid consumers paying for a service for which the network companies have already been remunerated and welcome the opportunity to clarify the mechanisms and reporting applicable to the existing Directly Remunerated Services (DRS) categories. We favour alignment of categories across the networks but note that there may need to be additions to the categories because of changes of charging methodologies, for example, National Grid is currently discussing 'CMP289- explicit charging arrangements for customer delays' with the industry.

We also agree that the actual revenue earned, or costs incurred may differ from original forecasts and agree that we investigate true-ups methodologies for sole use connections and income for Telecommunications to incentivise networks to maximise consumer value.

We consider each of the categories for both Electricity Transmission and Gas Transmission.

Electricity Transmission

For the majority of categories, the appropriate treatment of DRS is to exclude costs from companies' cost allowances and excluding revenues from use of system charges with both revenues and costs required to be reported separately from totex. We agree that this treatment is applicable to the following categories:

- DRS2. Diversionary Works being the relocating of any electrical line or electrical plant under statutory obligations.
- DRS3. Alterations being the moving of any electrical lines or plant to accommodate extensions, redesigns, or redevelopment of any premises that cover the Transmission System.
- DRS5. Outage Changes being the net costs reasonably incurred by the licensee as a result of any outage change.
- DRS11. Miscellaneous

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Maintaining a miscellaneous classification enables adoption of this treatment where appropriate for revenue and expenditure which is not captured within defined categories with any being captured in the annual RRP reporting.

We also support the removal of the DRS10. Network Innovation Competition (NIC) payments from DRS reporting.

For the DRS4. Telecommunications category, we note that Ofgem have included a link relating to a consultation document proposing a mechanism relating to the treatment of rental incomes earned by NGET for providing space on its towers for telecoms equipment. Ofgem's preferred approach is that networks retain 50% of profits earned from the rental agreement with the remainder shared by consumers. However, this document is a consultation not a determination of the methodology. We agree with the principle of NGET retaining 50% of the actual profits earned from this rental agreement (the net of the revenues and associated costs) with the remainder passed to consumers. We also support that this adjustment is carried out at the end of the price control period. We understand that this change is effective from T1 and will continue to apply into RIIO-2.

For the DRS1. Sole-use Connections, we welcome the opportunity to clarify the reporting and treatment of sole-use connections at the start of the price control but require further clarification on how Ofgem intend to apply the Distribution treatment of sole use connections to Electricity Transmission.

Any consideration of the treatment must take regard of the differences between the characteristics of sole use connections for Electricity Transmission and Distribution networks, for example, the drivers of the requirement and the differences in competitive environments. The variation in charging methodologies also require consideration, significant differences being the inclusion of maintenance charges in the billing and customers having the ability to choose to pay for the connection costs for up to 45 years in the case of Electricity Transmission as compared with Distribution. A full assessment will also need to consider whether the treatment would apply to the current value of sole use connections expenditure included in the network RAV.

To fully explore the options requires an in-depth assessment which will include implications on the charging methodologies. We propose that the networks work with Ofgem prior to the RIIO-3 period to consider the implications of taking direct connects outside of the price control and the subsequent implications on the customer and the end consumer.

For T2 we would like to consider mechanisms that incentivise the networks to be more efficient and deliver consumer value for the delivery of sole use connections.

Finally, we agree that the following DRS categories will not be applicable for Electricity Transmission within the RIIO-2 price control period:

- DRS6. Emergency Services
- DRS7. User Pays Agency
- DRS8. PARCA Activities
- DRS9. Independent System Operation

Gas Transmission

For the following categories, the appropriate treatment of DRS is to exclude costs from companies' cost allowances and excluding revenues from use of system charges with both revenues and costs required to be reported separately from totex:

- DRS2. The description included in the consultation document is 'Diversionary Works being the relocating of any electrical line or electrical plant under statutory obligations.' We agree with the treatment of the category with the proviso that the description is amended to 'the relocating of any gas pipes or plant (including the carrying out of any associated works) pursuant to any statutory obligation other than one imposed on the

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Licensee under section 9 (Powers and duties of gas transporters) of the Act (for avoidance of doubt Pipeline Diversion Costs are not an Excluded Service).

- DRS3. The description included in the consultation document is 'Alterations being the moving of any electrical lines or plant to accommodate extensions, redesigns, or redevelopment of any premises that cover the Transmission System. 'We agree with the treatment of the category with the proviso that the description is amended to 'moving of any gas pipes or plant that forms part of the Transportation System to which this licence relates to accommodate the extension, redesign, or redevelopment of any premises on which the asset in question is located or to which it is connected.'
- DRS6. Emergency Services being the provision of emergency services by one licensee to or on behalf of another, under the provisions of Standard Special Condition A41.
- DRS8. PARCA Activities being the revenues associated with provision of works relating to phase 1 of the Planning and Advanced Reservation of Capacity Agreements.
- DRS11. Miscellaneous

Maintaining a miscellaneous classification enables adoption of this treatment where appropriate for revenue and expenditure which is not captured within defined categories with any being captured in the annual RRP reporting.

For DRS4. Telecommunications (being the use of any assets forming part of the Transportation System to carry, either directly or indirectly, electronic information and data) we have not had data to report in RIIO-T1 and do not anticipate having any income to report in this category so would remove it from DRS reporting to the Non-Applicable category.

We also support the removal of the DRS7. User Pays Agency Services from DRS reporting and, although we are not anticipating costs associated with Must Reads within the RIIO-2 period, we are in agreement that these would be reported in the Miscellaneous category should income and expenses be incurred.

For the DRS1. Sole-use Connections, we welcome the opportunity to clarify the reporting and treatment of sole-use connections at the start of the price control and request further clarification on how Ofgem intend to apply the Distribution treatment of sole use connections to Gas Transmission.

Any consideration of the treatment must take regard of the differences between the characteristics of sole use connections for Gas Transmission and Distribution networks, key examples being the drivers of the requirement and the differences in competitive environments.

To fully explore the options requires an in-depth assessment which will include implications on the charging methodologies, if any. We propose that the networks work with Ofgem prior to the RIIO-3 period to consider the implications of taking direct connects outside of the price control and the subsequent implications on the customer and the end consumer.

For RIIO-2, we support investigation of a mechanism to true up connection allowances within the price control period.

Finally, we agree that the following DRS categories will not be applicable for Gas Transmission within the RIIO-2 price control period:

- DRS5. Outage Changes
- DRS9. Independent System Operation
- DRS10. NIC Payments

Disposal of assets question

FQ37. Do you have any views on the potential treatment of financial proceeds or fair value transfers of asset (including land) disposals for RIIO-2?

We propose the development of a consistent treatment of scrap proceeds across the sector and therefore advocate agreement of the principles that apply and clarification of the treatment of disposal proceeds prior to the business plan submission.

Network operators will generally dispose of assets as part of replacing, refurbishing or decommissioning existing assets. The scrapping of the redundant asset is a consequence of the asset management activity and Ofgem should incentivise networks to optimise their expenditure programmes as a whole taking additions and disposals together. The proceeds should therefore be considered as part of totex spend. Creating an appropriate economic incentive will encourage maximisation, in a timely manner, of sales proceeds to be shared between customers and shareholders.

As Ofgem have stated there are currently two alternative methods of treating financial proceeds under the current price control regimes:

- cash proceeds are netted off calculated additions to RAV
- cash proceeds are netted off against totex from the year

The timing of the adjustment is either within the year of occurrence or subject to time delay.

Reducing RAV additions by netting off cash proceeds (net of tax) will return the total value of disposal proceeds to the consumer and may be considered the optimal choice as networks are being reimbursed for the cost of the asset through the RAV. However, this is not always the case as the additions have been subject to capex/totex sharing factors through previous price control periods. The shareholder may therefore be penalised by giving back a larger reduction to the RAV than the original addition. This mechanism also does not encourage maximisation of disposal proceeds as 100% of the scrap proceeds is passed to the consumer.

Furthermore, reducing totex by netting off cash proceeds (net of tax) represents the substance of the transaction and incentivises networks to optimise their expenditure programmes by considering additions and disposals together. The networks are incentivised to maximise the value of the scrap proceeds as the both the customer and the shareholder will share the benefit through totex incentive mechanism. There is also regulatory precedent for application of this treatment within National Grid's current price control with legal settlements being categorised as negative totex and we note that this approach is followed by the Electricity Distribution Networks.

We propose that adjustments should occur on a timely basis in the year that the proceeds occur to enable sharing the benefits to the consumer as soon as possible.

The valuation method applied to the financial proceeds is independent of the treatment of the financial proceeds in the price control. Paraphrasing IFRS13, the fair value of the asset is the price that would be received to sell an asset in an orderly transaction between market participants at the date of disposal.

This principle is applied to record the transaction in the accounting records when there has been a market transaction and the network has received monetary consideration for sale of scrap, arm's length transaction to a third party and for the value of insurance settlements received. The net sales proceeds are recorded which is the sales proceeds received from a disposal less the costs of disposal. Costs of sale are the incremental costs of achieving the sale including transaction costs (for example, legal fees, commissions, professional adviser's fees) and costs of getting the assets into a saleable condition (such as, site clearance costs, systems separation costs). Costs of disposal do not include finance costs or taxation.

For intragroup transfers Ofgem has placed a licence obligation on the networks (ET: Condition B9. Indebtedness; GT: Standard Special Condition A39. Indebtedness) that all transfers to other group companies are made at arm's length. In this case, disposals would require an independent valuation to demonstrate that best consideration is being obtained. In practice,

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whenever there has been an intergroup transfer of land, National Grid has received external third party valuations based on the RICS guidelines and we would envisage that this approach is continued.

Appendix 1 : Assessment of political and regulatory risk, Oxera, 4 March 2019

Appendix 2 : Review of Indepen recommendations on beta estimation, NERA, 13 March 2019