# National Grid Transmission
# RIIO-T1: Initial Proposals consultation response
# Supplementary information – Relative risk assessment

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# Executive summary

1 Ofgem has previously recognised that it is in consumers' interests to ensure the financial package is not deficient. If the financial position of a network deteriorates, the costs of financing that business increase and could ultimately impact on its ability to invest appropriately in the network.

2 Companies within the same sector have traditionally been given the same financial package. One of the principles of RIIO is that the allowed return can differ across sectors and within sectors if there are material differences in cash flow risk. This approach is appropriate provided there is robust evidence of material differences in business risk.

3 National Grid provided detailed risk modelling as part of our business plan. This modelling quantified the uncontrollable risks facing the networks and demonstrated an increase in risk relative to TPCR4. This would indicate an increase in the asset beta and a requirement for an increase in the WACC relative to TPCR4 (for a given cost of debt). Indeed the Final Proposals for the fast tracked networks did imply an increase in asset beta from 0.40 to 0.43, consistent with expectation.

4 Ofgem has not engaged with us on the detail of our modelling so the Initial Proposals represent our first opportunity to gauge Ofgem's views on risk. Unfortunately we find Ofgem's risk assessment to be deficient in several respects:

(a) It is not backed by robust analysis or evidence

(b) The subjective risk assessment presented in the Initial Proposals omits a number of important risk factors and in other cases fails to adequately reflect the detail of Initial Proposals.

(c) It does not support the scale of asst beta implied by the financial package proposed

5 Ofgem has not performed any cash flow risk modelling of their own to support their analysis. Instead, their conclusions are based on a tabular summary of a number of risk factors. The subjective risk assessment fails to consider a number of key risk drivers including:

(a) The risks associated with the System Operator (SO) activities (risks which Ofgem does not remunerate through the SO control)

(b) The duration of cash flows

(c) The difference between ex ante allowances and within period determinations, and

(d) Notional gearing

6 Also, where risk factors are considered we typically find that elements of the regulatory package are double counted or simply do not reflect the detail of the Initial Proposals. This paper presents an alternative risk assessment and explains that NGET and NGGT both face higher risks than under TPCR4 and higher risk relative to both SPTL and SHETL.

7 Not only do we find that Ofgem's risk assessment contains errors and omissions and is not backed by robust analysis but the financial packages proposed are not credible from an implied risk perspective.

8 On behalf of the Energy Networks Association, Oxera reviewed the changes in asset beta implied from the proposed cost of equity and gearing assumptions, both across time and between sectors. They find that the movements in asset beta are not substantiated by the evidence presented.

9 By way of example, the scale of capex to RAV is considered the biggest driver of risk in Ofgem's proposals yet NGET's asset beta has fallen by 5% relative to TPCR4 despite an increase in the capex to RAV ratio, an increase in the totex sharing factor, an increase in the length of the price control and an increase in cash flow duration. It is not credible to set a financial package that implies a reduction in risk when risk has actually increased.

10 The risks faced by a regulated network are driven primarily by the regulatory framework. The RIIO framework is shared by each of the networks regulated by Ofgem and, while differences in risk do exist, the scale of difference implied by the Initial Proposals is not credible.

11 The asset beta has been increased by 7.5% for SHETL and SPTL who are in the same industry as NGET and face many similar challenges, incentives and uncertainty mechanisms, yet the implied asset beta for NGET is 11% lower than that of SPTL with the capex to RAV ratio being only 2% lower. Similarly NGGT's implied asset beta is a massive 20% lower than that of SPTL.

12 We therefore conclude that the proposed financial package fails to recognise and adequately remunerate the risks faced by both NGET and NGGT during the RIIO-T1 period.

13 The Initial Proposals sought to validate the financial package through the use of RORE analysis. Unfortunately the RORE analysis presented omitted a number of material incentive schemes, included inconsistencies in the calculations for NGET and NGGT compared to both fast tracked networks, misrepresented a number of incentive schemes in the calculations, and even included entries for which no incentive is actually proposed.

14 Our paper presents a corrected analysis demonstrating that the RORE range is wider for NGET and NGGT than SPTL under both the 'base' and 'best' view scenarios, and wider than SHETL for the 'base view', even if gearing for NGET and NGGT is reduced to 55%.

15 We therefore conclude that:

(a) NGET and NGGT face higher risk than TPCR4, SPTL and SHETL and should receive a higher WACC accordingly.

(b) Corrected RORE analysis suggests that a well calibrated package requires gearing to be reduced to 55%

(c) Notional gearing should be reduced to 55% and the cost of equity increased to achieve a more appropriate balance of risk and reward.

# Introduction

16 Ofgem acknowledged the impact on customers of a deficient financial package in their October 2009 document 'Arrangements for responding in the event that an energy network company experiences deteriorating financial health' where they wrote:

17 *"Our primary statutory duty is to protect the interests of existing and future consumers. Should the financial position of a network company deteriorate, that company may struggle to continue to invest appropriately and maintain its network and deliver acceptable network performance and customer service. If those conditions prevail over time it may threaten the security and reliability of that network company's customers' energy supplies."*

18 In setting the financial package it is important to recognise the consequences of getting it wrong. The water industry provides a useful illustration 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. The 2004 settlement increased the WACC and provided NPV positive financeability uplifts. Capex from 2005 to 2009 was significantly higher than 2000 to 2004.

19 Ofgem's determination of the financial package can be deemed to have (at least) two major parts (as well as a number of other elements such as asset lives, capitalisation rate, and transitional arrangements which feed into the overall assessment):

(a) Reviewing and calibrating the risk of our networks relative to other networks and TPCR4

(b) A financeability assessment to confirm that the financial package should allow an efficient network to finance its activities

20 This paper covers the first part. A separate paper reviews the financeability of the proposed financial package.

# Review of relative risk analysis

21 Companies within the same sector have traditionally been given the same financial package. One of the principles of RIIO is that the allowed return can differ across sectors and within sectors if there are material differences in cash flow risk. This approach is appropriate provided there is robust evidence of material differences in business risk.

22 National Grid provided detailed risk modelling as part of our business plan. This modelling quantified the uncontrollable risks facing the networks relative to TPCR4. Ofgem has not engaged with the detail of that modelling so the Initial Proposals represent our first opportunity to gauge Ofgem's views on risk. In this section we perform our critique of the risk analysis presented by Ofgem.

23 Ofgem present a summary of their consideration of risk factors in a tabular form (tables 3.3 and 3.4 of the Initial Proposals). These tables are reproduced in tables 1 and 2 below.

24 Within this document we review those tabular summaries. In doing so we find that the analysis omits a number of key risk factors while also including an issue which is not relevant to a consideration of cash flow risk. We also find that in some cases the initial review had been performed at too high a level and a review of the detail leads to different conclusions.

25 Tables 3 and 4 present National Grid's view of relative risk. Where this differs from Ofgem's view in the Initial Proposals, the text in the table is in orange text and the changes are explained in the narrative below. These tables include many of the risk factors used in Ofgem's analysis, but in some cases we have added or removed factors so as to better capture the networks' true risk exposure. Again any changes from Ofgem's analysis are explained.

26 In presenting our own version of the risk assessment tables we have sought to more clearly distinguish between asset or cash risk, i.e. those risks relevant to the company regardless of financial structure which are most relevant to an assessment of the cost of capital or WACC of a company, and those risks that are relevant specifically to the equity return because they relate to the financing of the business. We have done this by presenting both an asset risk and equity risk summary conclusion in the tables.

## Initial observations on relative risk analysis

27 The Initial Proposals explain that a key principle introduced as part of RIIO is that the allowed return for network companies should reflect their exposure to cash flow risk, and in the risk analysis this is interpreted as short-term cash flow risk or volatility. For this reason, in paragraph 3.26 the annual iteration process is said to reduce cash flow risk. However, in the original RIIO Decision documents from October 2010, it was explained that it is cash flow risk *over the long term*, i.e. value risk, which affects the cost of equity.

28 Therefore, although short term cash flow risk is relevant to financeability and so is a valid consideration for (notional) gearing, it is this long-term cash flow risk or value risk which informs the relative risk of returns to equity. In some cases considering cash flow risk on this correct basis leads to a different view of the relative risk under RIIO.

**Table 1 - Ofgem's summary of relative risk assessment for NGET**

| | NGET's risk relative to: | | | | |
|---|---|---|---|---|---|
| | **SHETL** | **SPTL** | **NGGT** | **GDNs** | **TPCR4** |
| **Scale of investment** | Detail provided in Initial Proposals **Lower** | Detail provided in Initial Proposals **Similar** | Detail provided in Initial Proposals **Higher** | Detail provided in Initial Proposals **Higher** | Detail provided in Initial Proposals **Similar** |
| **Complexity of investment** | Similar technical issues **Similar** | Similar technical issues **Similar** | A greater number of major interlinked projects **Higher** | Investment plan consists of larger, more complex projects **Higher** | Similar technical issues **Similar** |
| **Incentive rate** | SHETLS's incentive rate in RIIO-T1 is 50%. **Lower** | SPTL's incentive rate in RIIO-T1 is 50%. **Lower** | Detail provided in Initial Proposals **Higher** | GDNs' incentive rate ranges from 61-64% **Lower** | Detail provided in Initial Proposals **Higher** |
| **Totex approach** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Under totex approach, expenditure choice not driven by regulatory treatment. **Lower** |
| **Focus on outputs** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Delivery options not driven by regulatory treatment. **Lower** |
| **Uncertainty mechanisms** | The UMs are broadly similar. **Similar** | The UMs are broadly similar. **Similar** | Different UMs offering similar degree of protection. **Similar** | Not directly comparable | Additional mechanisms introduced in RIIO-T1. **Lower** |
| **Incentives** | Overall strength of incentives comparable but impact lower. **Lower** | Overall strength of incentives comparable but impact lower. **Lower** | Overall strength of incentives comparable. **Similar** | Overall strength of incentives comparable. **Similar** | Additional incentives introduced in RIIO-T1. **Higher** |
| **Pension costs** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Incremental deficit subject to totex incentive rate. **Higher** |
| **Cost of debt approach** | Bespoke approach potentially further reduces risk for SHETL. **Higher** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Annual update provides better match to notional company debt. **Lower** |
| **Length of price control** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Detail provided in Initial Proposals **Similar** |
| **Timing of revenue adjustments** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Changes reflected in allowances more quickly via annual iteration process. **Lower** |
| **Overall** | **Lower** | **Slightly lower** | **Higher** | **Higher** | **Similar** |

**Table 2- Ofgem's summary of relative risk assessment for NGGT**

| | NGGT's risk relative to: | | | | |
|---|---|---|---|---|---|
| | **SHETL** | **SPTL** | **NGET** | **GDNs** | **TPCR4** |
| **Scale of investment** | Detail provided in Initial Proposals **Lower** | Detail provided in Initial Proposals **Lower** | Detail provided in Initial Proposals **Lower** | Detail provided in Initial Proposals **Similar** | Detail provided in Initial Proposals **Lower** |
| **Complexity of investment** | Fewer and more isolated projects **Lower** | Fewer and more isolated projects **Lower** | Fewer and more isolated projects **Lower** | Predominantly larger bespoke projects **Higher** | Plan for RIIO-T1 is a continuation of the TPCR4 investment **Similar** |
| **Incentive rate** | SHETLS's incentive rate in RIIO-T1 is 50%. **Lower** | SPTL's incentive rate in RIIO-T1 is 50%. **Lower** | Detail provided in Initial Proposals **Lower** | GDNs' incentive rate ranges from 61-64% **Lower** | Detail provided in Initial Proposals **Similar** |
| **Totex approach** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Under totex approach, expenditure choice not driven by regulatory treatment. **Lower** |
| **Focus on outputs** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Delivery options not driven by regulatory treatment. **Lower** |
| **Uncertainty mechanisms** | Different UMs offering similar degree of protection. **Similar** | Different UMs offering similar degree of protection. **Similar** | Different UMs offering similar degree of protection. **Similar** | Not directly comparable | Proposed mechanisms consistent with TPCR4. **Similar** |
| **Incentives** | Overall strength of incentives comparable but impact lower. **Lower** | Overall strength of incentives comparable but impact lower. **Lower** | Overall strength of incentives comparable. **Similar** | Overall strength of incentives comparable. **Similar** | Additional incentives introduced in RIIO-T1. **Higher** |
| **Pension costs** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Incremental deficit subject to totex incentive rate. **Higher** |
| **Cost of debt approach** | Bespoke approach potentially further reduces risk for SHETL. **Higher** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Annual update provides better match to notional company debt. **Lower** |
| **Length of price control** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Detail provided in Initial Proposals **Similar** |
| **Timing of revenue adjustments** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Changes reflected in allowances more quickly via annual iteration process. **Lower** |
| **Overall** | **Lower** | **Lower** | **Lower** | **Slightly higher** | **Lower** |

**Table 3 – NGET's revised summary of relative risk assessment for NGET**

| | NGET's risk relative to: | | | | |
|---|---|---|---|---|---|
| | **SHETL** | **SPTL** | **NGGT** | **GDNs** | **TPCR4** |
| **Scale of investment** | Based on non-SWW expenditure and absolute spend **Higher** | Similar based on non-SWW expenditure but higher on absolute spend **Higher** | Based on non-SWW expenditure and absolute spend **Higher** | Based on non-SWW expenditure and absolute spend **Higher** | Similar on capex to RAV but higher on absolute spend **Higher** |
| **Complexity of investment** | SHETL investments less complex due to less highly meshed network **Higher** | SPTL investments less complex due to less highly meshed network **Higher** | A greater number of major interlinked projects **Higher** | GDN projects generally less complex **Higher** | Similar technical issues **Similar** |
| **New – Scope / unit cost risk** | Heavy use of SWW within period determinations **Higher** | Totex / volume drivers represent a similar proportion of total capex **Similar** | Most NGGT capex is funded by base totex or volume drivers **Similar** | Most GDN capex is funded by base totex or volume drivers **Similar** | Proportion funded through within period determination similar to TPCR4. **Similar** |
| **Totex Incentive rate** | SHETLS's incentive rate in RIIO-T1 is 50%. **Lower** | SPTL's incentive rate in RIIO-T1 is 50%. **Lower** | NGGT's incentive rate in RIIO-T1 is 45%. **Higher** | GDNs' incentive rate ranges from 61-64% **Lower** | Incentive rate has increased, particularly on higher risk capex **Higher** |
| **Focus on outputs** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | RIIO increases the financial consequences if outputs are not delivered. **Higher** |
| **Uncertainty mechanisms** | SHETL UMs have more protection from scope and price changes. **Higher** | SPTL UMs have more protection from scope and price changes. **Higher** | Less use of mid period and reopener mechanisms which carry a risk of leakage. **Lower** | Not directly comparable | Additional mechanisms introduced in RIIO-T1. **Lower** |
| **Non totex Incentives** | Overall strength of non totex TO incentives comparable. **Similar** | Overall strength of non totex TO incentives comparable. **Similar** | Overall strength of non totex incentives comparable. **Similar** | Overall strength of non totex incentives comparable. **Similar** | Additional incentives introduced in RIIO-T1. **Higher** |
| **Pension costs** | Same approach used. **Similar** | Same approach used. **Similar** | NGGT has more volatility on regulated proportion of deficit **Lower** | Same approach used. **Similar** | Incremental deficit subject to totex incentive rate. Removal of true up for ongoing costs. **Higher** |
| **Cost of debt approach (see below)** | Bespoke approach potentially further | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Annual update provides better match to notional company debt. |

| | | | | | |
|---|---|---|---|---|---|
| | reduces risk for SHETL. **Higher** | | | | Risk was funded through headroom in the debt allowance. **Lower** |
| **Length of price control** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Move from 5 to 8 year controls **Higher** |
| **Timing of revenue adjustments** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Quicker adjustments aid financeability but make no difference to asset or equity risk. **Similar** |
| **New - System Operator** | SHETL has no SO risks **Higher** | SPTL has no SO risks **Higher** | Both NGET and NGGT exposed to SO risk **Similar** | GDNs have no SO risk **Higher** | Intended move to longer term schemes would increase risk but lack of a BSIS scheme in 2013/14 reduces risk short term. **Unclear** |
| **New – Cash flow duration** | SHETL has a 16 year transition to 45 year asset lives **Higher** | SPTL has a 8 year transition to 45 year asset lives **Similar** | NGGT has a 45 year asset life for existing and new spend **Lower** | GDNs have a 45 year life but with front loaded depreciation and backlog depreciation **Higher** | TPCR4 used an asset life of 20 years **Higher** |
| **Overall – asset / cash risk** | **Higher** | **Higher** | **Similar** | **Higher** | **Higher** |
| **Cost of debt approach (see above)** | Business risk covered above | Business risk covered above | Business risk covered above | Business risk covered above | Risk no longer funded through headroom in debt allowance and so a risk premium is required n the equity return. **Higher** |
| **New – Notional gearing** | SHETL has 55% gearing **Higher** | SPTL has 55% gearing **Higher** | NGGT 62.5% gearing **Lower** | GDNs have 65% notional gearing. **Lower** | TPCR4 gearing was 60% **Similar** |
| **Overall – equity risk** | **Higher** | **Higher** | **Lower** | **Higher** | **Higher** |

**Table 4 – NGGT's revised summary of relative risk assessment for NGGT**

| | NGGT's risk relative to: | | | | |
|---|---|---|---|---|---|
| | **SHETL** | **SPTL** | **NGET** | **GDNs** | **TPCR4** |
| **Scale of investment** | Based on non-SWW expenditure and absolute spend **Lower** | Lower based on non-SWW expenditure, higher based on absolute spend **Lower** | Based on non-SWW expenditure and absolute spend **Lower** | Based on non-SWW expenditure and absolute spend **Higher** | Ofgem 'best view' levels comparable to TPCR4 (lower compared to RAV) but NGGT view is higher **Similar** |
| **Complexity of investment** | SHETL investments less complex due to less highly meshed network **Higher** | SPTL investments less complex due to less highly meshed network **Higher** | Fewer and more isolated projects **Lower** | GDN projects generally less complex **Higher** | Increase in number of interlinked projects increases complexity **Higher** |
| **New – Scope / unit cost risk** | Heavy use of SWW within period determinations **Higher** | A large proportion of spend is covered by base totex or volume drivers **Similar** | Most NGGT capex is funded by base totex or volume drivers **Similar** | Most GDN capex is funded by base totex or volume drivers **Similar** | Most expenditure is still funded through base totex / volume drivers **Similar** |
| **Totex Incentive rate** | SHETLS's incentive rate in RIIO-T1 is 50%. **Lower** | SPTL's incentive rate in RIIO-T1 is 50%. **Lower** | Detail provided in Initial Proposals **Lower** | GDNs' incentive rate ranges from 61-64% **Lower** | Incentive rate has increased, particularly on higher risk capex **Higher** |
| **Focus on outputs** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | RIIO increases the financial consequences if outputs are not delivered. **Higher** |
| **Uncertainty mechanisms** | NGGT has higher usage of ex post reviews, e.g. UMs that are reopeners or mid period review **Higher** | NGGT has higher usage of ex post reviews, e.g. UMs that are reopeners or mid period review **Higher** | More use of mid period and reopener mechanisms which carry a risk of leakage. **Higher** | Not directly comparable | Cash received sooner under entry / exit arrangements but later for most other mechanisms. Removal of collar on buyback increases risk. **Higher** |
| **Non totex Incentives** | Overall strength of non totex TO incentives comparable. **Similar** | Overall strength of non totex TO incentives comparable. **Similar** | Overall strength of non totex incentives comparable. **Similar** | Overall strength of non totex incentives comparable. **Similar** | Additional incentives introduced in RIIO-T1. **Higher** |
| **Pension costs** | SHETL has lower volatility on regulated proportion of deficit **Higher** | SPTL has lower volatility on regulated proportion of deficit **Higher** | NGGT has more volatility on regulated proportion of deficit **Higher** | NGGT has more volatility on regulated proportion of deficit **Higher** | Incremental deficit subject to totex incentive rate and more volatility on regulated proportion of deficit. Removal of true up for ongoing costs **Higher** |

| | | | | | |
|---|---|---|---|---|---|
| **Cost of debt approach (see below)** | Bespoke approach potentially further reduces risk for SHETL. **Higher** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Annual update provides better match to notional company debt. Risk was funded through headroom in the debt allowance. **Lower** |
| **Length of price control** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Eight year price controls. **Similar** | Move from 5 to 8 year controls **Higher** |
| **Timing of revenue adjustments** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Same approach used. **Similar** | Quicker adjustments aid financeability but make no difference to asset or equity risk. **Similar** |
| **New - System Operator** | SHETL has no SO risks **Higher** | SPTL has no SO risks **Higher** | Both NGET and NGGT exposed to SO risk **Similar** | GDNs have no SO risk **Higher** | SO risks increasing due to removal of caps and collars **Higher** |
| **New – Cash flow duration** | SHETL has a 16 year transition to 45 year asset lives **Higher** | SPTL has a 8 year transition to 45 year asset lives **Higher** | NGET has a 8 year transition to 45 year asset lives **Higher** | GDNs have a 45 year life but with front loaded depreciation **Higher** | The 45 year asset life is unchanged **Similar** |
| **Overall – asset / cash risk** | **Higher** | **Higher** | **Similar** | **Higher** | **Higher** |
| **Cost of debt approach (see above)** | Business risk covered above | Business risk covered above | Business risk covered above | Business risk covered above | Risk no longer funded through headroom in debt allowance and so a risk premium is required n the equity return. **Higher** |
| **New – Notional gearing** | SHETL has 55% gearing **Higher** | SPTL has 55% gearing **Higher** | NGET 60% gearing **Higher** | GDNs have 65% notional gearing. **Lower** | TPCR4 gearing was 60% **Higher** |
| **Overall – equity risk** | **Higher** | **Higher** | **Higher** | **Higher** | **Higher** |

## Risk factor removed

29 We have removed 'totex approach' from the table because it is not a determining factor of asset or cash flow risk. The Ofgem table already recognises that this factor is not a differentiator between networks under RIIO. The table did, however, claim a difference between TPCR4 and RIIO, where in each case the networks were seen as facing higher risks under TPCR4 than under RIIO.

30 While Ofgem's statement that expenditure choice is not driven by regulatory treatment under RIIO is factually correct, this makes no difference to the asset or cash flow risks that should be remunerated in the financial package. Networks already had a general efficiency duty under their respective licences. The risk that a network makes the wrong choice (whether incentivised by the regulatory treatment or not) is a diversifiable risk and not one that would be rewarded through a higher return. Consequently this factor is not relevant to the consideration of relative risk.

31 As a secondary argument, under RIIO the totex approach equalises the treatment of opex and capex costs. However under TPCR4 the near term cash flow consequences of opex and capex variances were also equal since no changes to revenue occurred during the price control period. Opex variances were funded by shareholders, and while capex variances would eventually lead to changes in allowed revenue, the income adjustment did not occur until the following price control.

## Risk factors added

32 We have added four risk factors to the table:

(a) Scope / unit cost risk (ex ante versus within period determination of allowances)

(b) System Operator risks

(c) Cash flow duration

(d) Notional gearing

### Scope / unit cost risk (ex ante versus within period determination of allowances)

33 The Ofgem table of risk factors covers the scale of capex and complexity of investment. The first relates to the absolute value of expenditure (relative to the RAV) whereas the second reflects the operational and technical complexity of the projects.

34 However, what these factors miss is the differences between the various controls in terms of when allowances for a particular capital project are set relative to the date of expenditure, i.e. it misses the distinction between allowances set on an ex ante basis and those set by within period determination. As an example, while SHETL may be forecasting to spend the most money on capex relative to the RAV, the bulk of this expenditure will be funded through the strategic wider works scheme whereby the scope and unit costs for the project will be set far closer to the date of actual expenditure when there is far greater certainty over the resultant costs. This significantly reduces the risk associated with expenditure and cash flows differing from allowances. We have added a scope / unit cost risk factor to the table to capture this factor.

35 Our assessment of this risk factor for NGGT is that risk is higher than the Electricity networks because the gas business has no strategic wider works, as was the case for the TPCR4 settlement. Within the Electricity networks, NGET faces similar risk to SPTL but

more than SHETL[1]. For NGET, the proportion of expenditure funded through within period determinations is broadly similar to TPCR4.

36 This risk factor is separate to the one relating to the timing of revenue adjustments as this relates to the risk that allowances and cost may differ due to the information available at the time of setting allowances. The timing of revenue adjustments is about the ex post treatment of any such variances.

37 This risk factor is also separate to the impact of moving from a five to eight year control which is considered below under 'length of price control'. Other aspects of uncertainty mechanisms are included in paragraphs 97 to 105 below.

## System Operator Risks

38 The risks associated with the System Operator function have been omitted from Ofgem's analysis. Ofgem has previously expressed a preference for the TO and SO controls to be considered separately. However, in setting the financial package Ofgem has not applied this approach and has linked the controls, for example by:

(a) Not separately considering the risks of the SO function, simply setting the same cost of equity and gearing for both controls

(b) Rejecting National Grid's proposal to adequately remunerate the risks facing the SO business in the SO control by allowing for a risk premium (the size of the SO RAV is such that a return on the RAV cannot credibly cover the risks faced by the business)

39 It is clear therefore that Ofgem is looking to finance the risks associated with the System Operator function using the balance sheet (RAV) of the TO control.

40 Since the System Operator risks are only relevant to NGET and NGGT, those networks naturally face higher risks in this regard.

41 For NGGT, the proposed removal of caps and collars from some of the SO incentive schemes points to an increase in risk relative to TPCR4. For example, our business plan shows credible exposure to capacity constraint management costs in excess of £100m in any one year.

42 For NGET, we do not yet have sufficient information to understand how risk compares to TPCR4. The effective removal of the BSIS scheme for 2013/14 would indicate less risk than TPCR4 but the longer term intent to move to longer term scheme parameters would unambiguously increase risk.

## Cash flow duration

43 Cash flow duration is another risk factor that has been omitted from Ofgem's analysis. Getting your money back sooner reduces the risk of not getting all of it back as it reduces your exposure to future risks. It is therefore highly relevant to the return an investor requires. The concept of requiring a higher return over a longer investment horizon is well established and a short summary of the arguments is presented in the Oxera paper that supports this response.

[1] These conclusions consider the mix of ex ante allowances versus within period determinations based on the 'best view' scale of capex. Later we argue that the scale of capex should be considered excluding SWW schemes at which point this conclusion would be different. We recognise that these judgements are arguably inconsistent. We address this in our summary of this section where the three capex related risk factors are considered in the round.

44 Comparing between networks, NGGT has the longest duration of cash flows due to the continuation of a 45 year asset life. The distribution networks also face a 45 year asset life but with a front loaded depreciation profile.

45 For the Electricity networks, risk has increased compared to TPCR4 since new investments will now be recovered over a longer asset life than the 20 years used previously. Risk is higher for NGET and SPTL than SHETL because SHETL has a 16 year transition to 45 years asset lives rather than 8 years.

### Notional gearing

46 Within reasonable ranges, the choice of financial structure makes no difference to the cash flow or asset risk of the company but does impact on the risk of equity holders relative to debt holders and so is relevant to the allowed equity return.

47 It is accepted in conventional finance theory that, for a given level of business risk, increasing gearing increases the risks to equity holders. Since equity holders only get a return after the payment of interest on debt, the higher level of debt increases the risks both to equity returns and cash flow.

48 Ofgem's assessment of relative risk ignores notional gearing and their consultants, FTI consulting, wrote in their report[2] "We have not been asked to consider notional gearing and financeability in this report". We find this surprising given that their scope included a review of the cost of equity.

49 The Initial Proposals include a notional gearing of 60% for NGET compared to 55% for the other two electricity transmission networks. Gearing for NGGT and the GDNs is higher still at 62.5% and 65% respectively.

50 The table below presents the equity returns that would be required to give the same WACC as that proposed for the fast track networks but with the levels of gearing currently proposed for NGET and NGGT. This table effectively shows the increase in return required when gearing rises if business / asset risk is unchanged.

| | Fast track | NGET Initial Proposals | NGET - normalised | NGGT Initial Proposals | NGGT - normalised |
|---|---|---|---|---|---|
| Equity return | **7.0%** | 7.0% | **7.50%** | 6.8% | **7.79%** |
| Cost of debt | 3.03% | 3.03% | 3.03% | 3.03% | 3.03% |
| Gearing | 55% | 60% | 60% | 62.5% | 62.5% |
| WACC | 4.82% | 4.62% | 4.82% | 4.44% | 4.82% |

51 The table above shows two things; firstly that higher gearing requires a higher equity return, and secondly it shows the magnitude of the difference in equity return currently proposed in the Initial Proposals for NGET and NGGT relative to the fast track networks.

52 The notional gearing factor has been placed at the bottom of tables 3 and 4 to recognise the differential impact on equity risk as opposed to asset risk.

## Risk factors where our assessment differs

53 The comments above explained our assessment for the rows that we have added to tables 3 and 4. Rather than covering every comment for the remaining risk factors, the

[2] FTI Consulting, 'Cost of Capital study for the RIIO-T1 and GD1 price controls' (July 2012)

paragraphs that follow focus on the comments where National Grid has taken a different view from that expressed in the Initial Proposals.

## Scale of investment

54 Ofgem has placed a lot of weight on the scale of investment (relative to the RAV) as a driver of both cash flow risk and uncertainty.

55 In this response we have sought to assess the true underlying drivers of cash flow risk. Spending a lot of money is not as high risk if you know it will all be funded (compared to not knowing if it will be fully funded). We have therefore split the overall risks associated with capex into several categories:

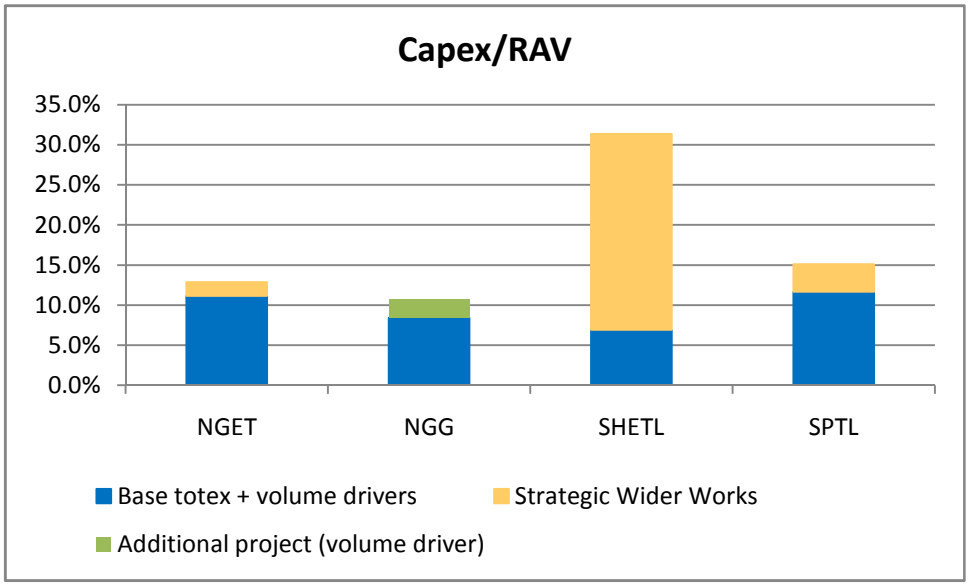
(a) Scale of investment – This relates just to the value of expenditure and can be measured relative to the RAV or in absolute terms

(b) Scope / unit cost risk – See above. This relates to the potential for cost allowances to differ from what is actually spent due to the passage of time between the setting of allowances and date expenditure is incurred. Since this is an issue of when allowances are set relative to the expenditure, ex ante allowances are considered higher risk than the SWW scheme.

(c) Complexity of investment (see below) – This is a second cost versus allowances factor, whereby more complex investments are inherently more risky when it comes to the scope (and possibly timing) of works and so carry greater cash flow risk.

56 Our view on scope / unit cost risk was considered above, while complexity of investment is considered in paragraphs 73 to 81 below. When it comes to the scale of investment Ofgem uses figure 3.1 in the Initial Proposals to demonstrate that SHETL has the highest capex / RAV ratio while that of SPTL is similar to NGET, with NGGT lower risk than the electricity networks but higher than the distribution networks.

57 We have reproduced this analysis below. We have combined the base totex and volume driver allowances as the unit costs are set at the beginning of the price control for both of these so they have equivalent price risk. Strategic wider works are shown separately. Paragraph 3.14 in the Initial Proposals recognises that within period determinations "reduce both unit cost and volume risk."



58 Perhaps the most important point to note is that if strategic wider works investment is excluded the ranking of the networks changes with SPTL and NGET the highest, and NGGT also facing a higher scale of investment than SHETL.

59 The Initial Proposals overview document for NGET and NGGT clearly states that SWW expenditure many not be undertaken by the relevant network. Paragraph 1.40 reads:

> "*For the avoidance of doubt, projects treated as SWW in our RIIO Final Proposals could be subject to this competitive process and therefore potentially delivered by a third party TO*"

It is therefore sensible to exclude this type of spend from the analysis.

60 Ofgem has previously set out the criteria against which it would judge whether a project may be suitable for third party delivery. They are:

(a) the project in question is significant in scale and/or cost

(b) the project involves assets required for expansion of the network that are not meshed with existing assets, or can be defined in such a way that they are not meshed with existing assets

(c) giving third parties a greater role in delivery will not pose significant risks to timely delivery, including the timely delivery of emission reduction or renewable targets

(d) giving third parties a greater role in delivery will not pose significant risks to the safety, security, integrity and quality of energy services

(e) we can demonstrate the expected potential long-term net benefits

(f) we are confident that giving third parties ownership of relevant assets will not compromise the legitimate expectations of existing licensees who made investments without knowledge of the possibility of assets potentially being transferred to a third party at a later date

(g) giving third parties a greater role in delivery will be compliant with domestic and relevant EU legislation, including the Third Package.

61 On reviewing these criteria it appears that the potential for an SWW scheme to be eligible for third party delivery is higher in Scotland than England and Wales, if only because such schemes are less likely to be meshed with existing assets.

62 This presumably means that, at the moment, it is not clear exactly who will deliver the SWW schemes during the RIIO-T1 period, particularly in Scotland. It would be inappropriate therefore to assume the SWW schemes will be completed by the current geographical incumbent TO.

63 Consequently such schemes should be excluded from the consideration of cash flow risk in setting the financial package and, as stated in paragraph 58 above, if SWW schemes are excluded, SPTL and NGET have the highest capex / RAV ratio, with NGGT comparable to SHETL.

64 One further point to note however is that Ofgem's analysis includes the SWW schemes in full even though the scope, volume and unit costs are uncertain. Notwithstanding our comments that SWW schemes may not be delivered by the geographically incumbent TO, it is even less certain whether the investments will take place at all, or the level of

investment required. Nevertheless, these investments have been included in full in the assessment of relative risk.

65 This same principle has not however been applied to NGGT where the best view of expenditure reflects a significant Ofgem adjustment. As paragraph 7.55 of the 'Cost assessment and uncertainty supporting document' explains:

"*We recognise that NGGT's proposal is based on the information on costs and phasing which is currently available. However, we are concerned about the amount of projects that are suggested by NGGT, but are not yet backed by user commitment. Based on past experience there is a 25 percent attrition in such projects and the remainder of those are on average deferred by 2 years*."

66 Ofgem's best view is therefore based on a relatively arbitrary downward adjustment. This adjustment does not remove the potential need to carry out the investments, it is just a lower figure. Compared to NGET, the NGGT load related investment projects are relatively few in number but individual projects can cost upwards of £1 billion. In this context it is extremely credible that investment could be materially higher than the view proposed by Ofgem and the financial package needs to be robust to credible higher levels of capex.

67 The inconsistency in approach between including SWW in electricity yet excluding an informed view of incremental capacity schemes in gas is inappropriate. Ofgem's primary explanation appears to be that the investments are not backed by a user signal. The same can be said for the SWW schemes.

68 While this inconsistency theoretically has no impact on the charges customers will actually pay it does have a material impact on Ofgem's consideration of the financial package and of relative risk. Ofgem has justified the lower cost of equity and higher gearing for NGGT largely on the back of lower capex requirements. A consistent treatment of uncertain schemes could have resulted in a different answer.

69 When it is further considered that additional schemes for NGGT would be based on a volume driver with the unit costs set prior to the commencement of the price control, it is clear that any additional capex for NGGT would be higher risk than capex funded through SWW.

70 The chart at paragraph 57 shows the NGGT investment if just one additional material project happens. A similar picture would emerge from the addition of two smaller projects. The chart demonstrates that the scale of investment that is relevant to a consideration of cash flow risk is comparable for NGET, SPTL and NGGT. SHETL actually has a lower volume of capex subject to allowances set at the price control, and only has higher capex (relative to RAV) if the less certain and lower risk SWW schemes are included[3].

71 The discussion above has focussed on capex / RAV as this is the measure of investment scale that Ofgem has focussed on. However this is not the only measure of investment scale. Standard & Poor's for example place weight on the absolute levels of capex. In their document 'How Ofgem's Latest RIIO Proposals Could Increase Credit Risk for National Grid and Gas Networks in England and Wales' (July 2012) they noted that high levels of capex could increase risk for National Grid:

[3] These conclusions are based on a view of capex excluding SWW spend. Earlier on we considered the mix of ex ante allowances versus within period determinations based on the 'best view' scale of capex which included this spend. We recognise that these judgements are arguably inconsistent. We address this in our summary of this section where the three capex related risk factors are considered in the round.

*"The totex expenditure for National Grid's electricity and gas transmission networks is in relative terms less than, but in our view still as daunting, as that approved for the Scottish transmission grids earlier in the year. We associate large capex with a high degree of execution risk and massive funding requirements, partly mitigated by the promise of higher returns in the future."*

72 On this measure, a comparison of the NGET and NGGT Initial Proposals best views to the Final Proposals best views for SPTL and SHETL shows NGET faces considerably more scale of investment risk than any other network. The levels of investment for NGGT are higher than those of SPTL but lower than SHETL.

## Complexity of investment

73 Ofgem's assessment was that all three electricity networks had comparable complexity of investment due to there being similar technical issues. This is evidently not the case.

74 The transmission network in England and Wales is more highly meshed than in Scotland making investments far more complex. The network south of the border also carries larger power flows such that the consequences of failure are larger, a fact that is recognised in the security standards.

75 Further, SHETL has a far greater proportion of its investment in offline builds on green field sites compared to both SPTL and NGET. NGET has the lowest proportion of offline build.

76 While the scale of investment factor considered above covered expenditure as a proportion of RAV, when it comes to inter-linked projects, NGET faces far more complexity than the fast tracked networks. This complexity increases the risk of unforeseen amendments to projects and so increases the risk of costs differing from allowances.

77 The volume of non load related projects is higher for NGET. Such projects are inevitably more complex as they concern the meshed networks and require outages etc on the existing network. A key activity (and risk) that National Grid has to manage is the churn of which projects should and can be performed when. NGET's future investments are therefore more complex and carry higher risk than the other networks.

78 Ofgem's table considered NGGT to face lower risk than the electricity networks because there are "fewer and more isolated projects". As with NGET, the NGGT network is highly meshed. While there are typically a smaller number of projects, a peculiar feature of the NGGT network is that the investments required depend critically on the assumptions adopted for other changes in capacity. The passage of time can very easily result in other signals being triggered which can change the optimal investment requirements, quite often many miles away from the specific entry or exit point being considered. This feature of the NGGT network is particularly challenging given the current proposal to set all of the unit cost allowances up front.

79 Complexity is about the scope of works where the inter-linked nature of projects and highly meshed network are the drivers of risk. The number of projects is not particularly important, other than to the extent to which it impacts on the degree of linkages between projects. NGGT is characterised by a small number of very large inter-linked projects.

80 Historically, the inter-linkage of projects on the NGGT network was not particularly significant. However the requirements of the network have changed as the sources of gas supply and demand have evolved causing a requirement to focus more heavily on the need to build a flexible network capable of managing variable and uncertain gas flows.

81 Consequently we consider this risk factor to be higher for both NGET and NGGT than the less highly meshed fast tracked networks. For the reasons stated above, we consider NGGT risk to have increased relative to TPCR4 but to be lower than that of NGET.

### Totex Incentive rate

82 We agree with Ofgem's assessment of relative risk between networks when it comes to the totex incentive rate, although the sharing factors may well change in the Final Proposals. We do not however agree with the assessment relative to TPCR4.

83 In table 3.2 of the Finance document Ofgem compares the weighted average incentive rate under RIIO-T1 to TPCR4. In doing so they conclude that the incentive rate for NGET is slightly higher than TPCR4 but broadly the same for NGGT once it is recognised that the incentive rate under RIIO is post tax.

84 We believe this conclusion is ill founded on three grounds:

(a) The difference for NGET cannot be described as "slightly higher"

(b) The comparison is based on TPCR4 allowances

(c) It is a simple average and ignores the relative risk of opex and capex

85 The left hand side of the table below reproduces Ofgem's analysis but adds an additional row to show a pre-tax equivalent of the RIIO sharing factor. This has been derived in a simplistic way by dividing the post tax factor by 0.78, on the basis that for most of the RIIO-T1 years the tax rate is expected to be 22%.

86 The table shows that for NGGT, the pre-tax equivalent RIIO sharing factor is 57.2% compared to 59.1% under TPCR4. These results are consistent with Ofgem's assessment as "broadly the same".

87 However, for NGET, the RIIO sharing factor of 61.7% is significantly higher than the 47.3% of TPCR4 and so cannot be deemed only to be "slightly higher".

| | Using TPCR4 allowances | | Using 'best view' RIIO allowances | |
|---|---|---|---|---|
| | NGET_TO | NGGT_TO | NGET_TO | NGGT_TO |
| Allowed opex (100%) | 1,289 | 688 | 1,503 | 743 |
| Allowed capex (25%) | 3,041 | 824 | 11,642 | 3370 |
| Incentive rate (TPCR4) – pre tax | 47.3% | 59.1% | 33.6% | 38.5% |
| Incentive rate (RIIO) – post tax | 48.1% | 44.6% | 48.1% | 44.6% |
| Incentive rate (RIIO) – pre tax equivalent (divide by 0.78) | 61.7% | 57.2% | 61.7% | 57.2% |

88 Our second concern is that the analysis is based on TPCR4 allowances. When comparing risk between controls it is also relevant to consider what the comparable risk package would have been for the RIIO-T1 period. The right hand columns in the table above use the best view allowances and show that the post tax RIIO incentive rates significantly exceed the weighted pre tax TPCR4 rates for both NGET and NGGT. The pre tax equivalent RIIO incentive rates are even higher.

89 The risks that should be remunerated in the equity return are the non diversifiable uncontrollable risks. A simple weighted average does not adequately convey the change in risk between TPCR4 and RIIO-T1. Capex is far more risky than opex because it is subject to far more uncertainty in terms of outturn costs versus expectation. It is also subject to far more uncontrollable risks than opex. While there will always be exceptions, opex costs are generally more stable. They are typically non project based and recur each and every year with relatively minor incremental movements due to real price effects, incremental efficiency movements, or structural changes, e.g. a need to recruit additional staff as the network (and supporting activity) grows in size.

90 Capex is a collection of capital projects. While projects may have characteristics in common they are far less predictable than opex. Projects may encounter different issues in terms of system design and technical requirements, planning and consents and geographic / terrain problems to name but a few.

91 In this context it is the incentive rate on capex that makes the most difference to risk and, generally speaking the incentive rate on capex is more than doubling from a pre tax rate of 25% to a pre tax equivalent RIIO rate of 61.7% or 57.2% as appropriate. Even the post tax RIIO rates are almost double the TPCR4 pre tax rates.

92 For all of the reasons cited above we conclude that the incentive rate represents a significant increase in risk relative to TPCR4 and as regards the relative risk of the different networks under RIIO, on this factor NGGT is lower risk than the fast-tracked networks (and NGET). NGET has lower risk than the fast-tracked networks but the difference is only marginal with an incentive rate of 48.1% compared to 50% for SPTL and SHETL.

93 That capex is more risky than opex is acknowledged by Ofgem in their focus on scale of investment as a measure of risk. Figure 3.1 in the Initial Proposals plots Capex / RAV for the different networks and ignores the relative differences in their opex. It is clearly then inconsistent, and unjustifiable, in Table 3.2 of the Initial Proposals, to treat opex and capex as equally risky in an attempt to show that the incentive rate (and as a result overall network risk) has not increased significantly under RIIO. Alternatively, if Ofgem now wanted to consider the scale of both capex and opex (relative to RAV) as relevant to risk, Figure 3.1 in the Initial Proposals should be corrected to include opex, including SO opex in the cases of NGET and NGGT. On such a basis, the risk exposure of NGGT and NGET relative to the fast-tracked networks would be increased.

94 Paragraph 3.12 of the Initial Proposals puts forward the proposition that "*The incentive rate does not, we [i.e. Ofgem] consider, have a material effect on the asset beta but will influence the appropriate level of notional gearing and therefore the weighted average cost of capital*." We agree that the incentive rate influences notional gearing and the WACC, but asset beta would only be unaffected by incentive rate if the incentive rate was only applied to diversifiable risks. In reality all cost variances, whether originating from systematic or diversifiable factors, are equally subject to the incentive rate, so it is clearly the case that asset beta is affected by the incentive rate.

## Focus on outputs

95 The table in the Initial Proposals correctly identifies that the focus on outputs is similar for all networks and so is not a differentiating factor between networks. However, it claims that risk is lower relative to TPCR4 because "delivery options are not driven by regulatory treatment".

96 This appears to be a duplication of the arguments made under 'totex approach' and discussed above in paragraphs 29 to 31. One of the key aims of RIIO is to make the

networks more accountable for the outputs they deliver. Once the duplication of the equal treatment of opex and capex is removed, this risk factor unambiguously increases risk since the networks could face financial consequences if outputs fail to be delivered, whether due to the decisions of the network or, potentially, due to unforeseen uncontrollable events.

### Uncertainty mechanisms

97 To avoid double counting elements of the proposed regime we have used this risk factor to consider the relative protection from risks provided by uncertainty mechanisms. We do not comment on the timing differences between ex ante allowances and within period determinations here as that was included in our 'scope / unit cost risk' comments in paragraphs 33 to 37 above.

98 Ofgem's relative risk assessment concluded that the electricity networks had broadly similar uncertainty mechanisms (UMs) and that the NGGT UMs were different but offered a similar degree of protection.

99 For NGGT, the removal of caps and collars from the buyback scheme unambiguously increases cash flow risk relative to TPCR4. The Initial Proposals do not provide enough clarity on the impact on cash flows of the proposals for capacity revenue drivers though we are exploring these issues through bilateral meetings.

100 From these meetings we understand that the proposals on entry / exit capacity provide funding earlier than the TPCR4 arrangements. However they do not change the value of that funding and so do not change long term asset or cash risk. Further, Ofgem's rejection of National Grid's two stage entry / exit capacity revenue driver proposal exposes NGGT to a risk of loss on feasibility and other early scheme costs for projects that do not result in an auction signal. This is discussed more fully in our main response.

101 The other NGGT uncertainty mechanisms are expected to provide a similar level of protection to TPCR4 in long term value terms. However, most of these schemes have an ex post element either through re-openers or the mid period review and will result in significant delays and potential risks to the level of funding.

102 We therefore conclude that with regard to uncertainty mechanisms NGGT is higher risk than NGET and TPCR4.

103 For the electricity networks it is not true to claim that the UMs are broadly similar. Some UMs apply to one network only and even when they do share a UM in common there are often significant differences in the detail that are relevant to cash flow risk.

104 Examples of differences include:

(a) NGET has a boundary capacity volume driver which is not shared with the fast tracked networks. This covers approximately £2.6bn of spend and will adjust allowances based on volumes only using a fixed unit cost set as part of the price control review. NGET also has a fixed UCA under the demand volume driver. These UMs are unique to NGET.

(b) All three networks have a generation volume driver but whereas NGET has a single fixed unit cost allowance (UCA), the fast tracked networks have either a banded or variable UCA which is lower risk. Also, the SPTL arrangements appear to be input based rather than output based (e.g. number of transformers etc) and so involve much lower scope risk.

(c) SPTL has a within period determination UM for some of its non load expenditure requirements which reduces risk. SHETL and NGET do not have such an arrangement.

(d) Under SWW, SHETL can prescribe additional projects to within period determination if they exceed £50m. For NGET the value has to exceed £500m. As we understand it, the fast tracked networks also have additional income adjusting event provisions within the SWW UM.

105 Based on a closer review of the detail of the UMs we conclude that NGET faces higher cash flow risk than the fast tracked networks. We have not changed Ofgem's assessment of NGET risk falling relative to TPCR4 in regard to this risk factor.

### Non totex Incentives

106 Ofgem's analysis stated that for NGET and NGGT, the overall strength of incentives was comparable to the fast tracked networks but the impact was lower. We believe this result was largely down to the combination of the totex figures and totex incentive rate which we agree is higher for the fast tracked networks under the best view scenario. However, these cash flow risk factors have already been considered elsewhere in the table and so should not be duplicated. Consequently we have amended this category to be 'non totex incentives' as these have not been considered elsewhere.

107 Since the parameters of these incentives are the same for each network (e.g. the customer incentive is +/- 1% of revenue for all networks) we consider their impact on the networks to be similar.

108 We agree with Ofgem's view that the additional incentives increase risk relative to TPCR4.

### Pension costs

109 We largely agree with Ofgem's assessment of the impact of pension costs on cash flow risk, namely that the impact is similar across the electricity networks and higher than TPCR4 due to the treatment of incremental deficits. In addition there is increased risk exposure in relation to ongoing costs under RIIO compared to TPCR4 following the removal of the TPCR4 true up treatment. This further supports Ofgem's conclusion of increased relative risk in relation to pension costs.

110 However, we do not agree that risk is comparable to the other networks for NGGT. The latest draft of the pension deficit allocation methodology (PDAM) still separately allocates pension scheme assets and liabilities rather than allocating the deficit as was the case in TPCR4. By allocating two big numbers separately (and on a different basis) rather than the difference between them the PDAM significantly increases the volatility of the resulting regulatory fraction and so the proportion of the deficit that will be funded. The history and size of the National Grid UK defined benefit scheme is such that this volatility and resulting risk is higher for NGGT than the other networks.

### Cost of debt approach

111 We have commented on whether the proposed index-based allowance for cost of debt will, on average, compensate a notional network for its efficient cost of debt in our general response to the Initial Proposals. This question is separate from the question of risk or uncertainty, i.e. the volatility of returns that results from the mismatch between allowed and out-turn debt costs, that is relevant to the relative risk assessment considered in this paper.

112 Although the introduction of a cost of debt index will, at least for the transmission networks under RIIO-T1, reduce the impact of cost of debt risk on the volatility of returns, it does not eliminate that volatility. In previous price controls equity holders were compensated for bearing this risk through headroom on the allowed cost of debt. Under the Initial Proposals all of this headroom has been removed, even though some of the risk remains.

113 Therefore, even though the risk may have been reduced by the index, the amount of this risk that needs to be taken into account in setting equity returns and/or notional gearing has actually increased. This is reflected in Tables 3 and 4 above which show National Grid's view of all the different risk factors, and in which the cost of debt factor is shown twice.

114 For Transmission the cost of debt index should reduce overall cash or asset risk for the networks relative to TPCR4. However, debt risk is not eliminated by the index so we have also shown cost of debt at the bottom of the table to show the incremental impact on equity risk rather than asset risk. The fact that cost of debt risk is no longer funded through headroom in the debt allowance means that an additional risk premium is required in the equity return.

### Length of price control

115 On length of price control, the logic of Ofgem's assessment as explained in paragraphs 3.23 to 3.27 of the Initial Proposals, is essentially to offset the increased cost variance risk caused by moving from five years to eight years with the shorter timescale adopted for revenue adjustments as a result of the annual iteration process.

116 This logic has not been appropriately reflected in Ofgem's risk assessment because this has separate risk factors for the length of the price control and the timing of revenue adjustments. It is therefore inappropriate to take the timing of the revenue adjustment into account in considering the impact of the length of the price control, as this leads to double counting of this factor. In any case, as explained below, a shorter timescale for making revenue adjustments does not directly affect the risk to asset or equity returns, although it does affect cash flow risk and so needs to be considered in assessing financeability.

117 After removing the double counted impact of the timing of revenue adjustments we have shown the length of the price control as increasing risk compared to TPCR4. Ofgem's own consultants, FTI consulting, agreed in their report[4] that the length of the price control increased risk relative to TPCR4, while acknowledging that other factors such as uncertainty mechanisms mitigated some of this increase. These other factors are shown separately in the risk assessment table.

### Timing of revenue adjustments

118 While the timing of cash flows is relevant to financeability and the risks to cash flow, this is a timing issue only and does not affect the economic returns to equity holders. This leads to a different view of the impact of the "timing of revenue adjustments" factor on short term cash flow risk (which is relevant to financeability) and longer term cash flow risk, which is relevant to return. Since financeability is primarily assessed by considering the acceptability of credit metrics under various scenarios (including base view, best view, and various alternative scenarios) as explained at Paragraphs 4.1 to 4.5 of the Initial Proposals, as well as consideration of various qualitative factors, it is the risk to cash flows over the longer term which should be shown in the relative risk table.

[4] For example paragraph 6.23

119 This point is reinforced in Oxera's report where they state "The proportion of the under- or over-spend that is borne by the company is unaffected by the timing of revenue adjustments."

120 On this basis the timing of revenue adjustments is not only similar across all networks under RIIO, but has little impact on the asset or cash flow risk under RIIO relative to TPCR4.

## Overall conclusion of relative risk assessment

121 National Grid provided detailed risk modelling as part of its business plan that demonstrated an increase in risk relative to TPCR4. Ofgem has not engaged us on that modelling and, while FTI Consulting commented that such modelling is only as good as the assumptions used, they acknowledged that such modelling can be directionally indicative of movements in risk.

122 Both the relative risk assessment presented by Ofgem (reproduced in tables 1 and 2) and our own presentation (tables 3 and 4) are subjective in nature. Nevertheless they can provide additional insight.

123 A simple count of the number of categories where NGET or NGGT faces "higher", "similar" or "lower risk" presents a very stark picture of risk being far higher for NGET and NGGT versus TPCR4, SHETL and SPTL. While this is one way to view the tables we are not suggesting that the difference in risk is as material as a basic count may suggest.

124 One way to improve the quality of the assessment is to consider the materiality of each item, i.e. to weight them in some way and focus on the more material items. We consider the more significant risk factors to be:

(a) Investment related factors

(b) Incentive rate

(c) Length of price control

(d) System Operator

(e) Cash flow duration, and

(f) Notional gearing

### Investment related factors

125 The investment related factors include the scale of capex, complexity of investment, and whether allowances are set ex ante or by within period determination. We have argued that the scale of investment should be considered excluding SWW investment while also arguing that the higher proportion of SWW funded schemes for SHETL makes their investment lower risk than that of NGET and NGGT. It may not be appropriate for us to consider NGET more risky on both factors as this would represent inconsistency of thought. However, the conclusion remains valid if the absolute scale of investment is used as the measure of investment scale.

126 Also, when the three factors are considered in the round we can adjust for any apparent inconsistency. Compared to SPTL, NGET faces slightly higher risk due to the complexity of investment while the other factors are similar. SHETL is expected to invest more relative to the RAV than NGET but the risks associated with this are lower due to the

allowances being set by within period determination. Again, NGET has greater complexity to manage. On balance, the three investment factors combine to leave NGET facing higher risk than the fast tracked networks but possibly not materially so.

127 When it comes to NGGT, the rate of investment is lower than both fast tracked networks relative to the RAV but higher than SPTL in absolute terms. The risks associated with the investment are higher as a result of the operation of volume drivers rather than within period determination. It is therefore unclear what the true impact on risk is though NGGT's investments are more complex due to the significant inter-linkages of the projects. Complexity of investment represents an increase in NGGT risk relative to TPCR4.

### Incentive rate

128 The incentive rate is a key risk factor as it represents the proportion of any expenditure variance borne by the network. In this regard NGET and NGGT are slightly lower risk than SHETL and SPTL. However, it is important to recognise that both fast tracked companies received full cost allowances whereas the allowances for NGET and NGGT have both been cut relative to their plans. While NGET and NGGT may suffer a slightly lower proportion of any overspend, the probability of overspend is probably higher.

129 Compared to TPCR4 there can be little doubt that risk has increased. A review of pre tax equivalent sharing factors unambiguously shows higher risk for NGET. While the rates may look similar for NGGT, capex is more risky than opex and the sharing factor on capex is increasingly significantly.

### Length of price control

130 The increase in the length of the price control clearly increases risk relative to TPCR4 as the period of time between setting allowances and incurring the costs is increased. It is far more difficult to predict costs six to eight years ahead than it is to predict costs that will be incurred in the near term.

131 While uncertainty mechanisms seek to mitigate this increase in risk they are unlikely to be perfect in their protection while the timing of revenue adjustments makes no difference to the value at risk.

### System Operator

132 The System Operator risks are highly material. As explained in paragraph 41, the exposure in NGGT could exceed £100m in a given year. The removal of caps and collars makes this an increase in risk relative to TPCR4 and neither SHETL nor SPTL face any similar risks.

133 The RORE analysis later in this paper also demonstrates the materiality of the SO risks facing NGET and NGGT.

### Cash flow duration

134 Oxera has previously presented evidence that the 'term premium' effect of an increase in cash flow duration could be worth as much as 60 basis points on the cost of equity making this a material risk factor.

135 There can be little doubt that with a 45 year asset life and no transitional measures NGGT faces the highest risk in this regard. Equally, there can be no doubt that risk is higher than TPCR4 for the electricity networks as they move from a 20 year life to 45 years. Risk is

higher for NGET than SHETL due to the difference between moving to a 45 year life over 8 rather than 16 years.

## Notional Gearing

136 Within reasonable limits, the rate of notional gearing does not impact on business risk. It does however make a material difference to equity risk and the equity return required.

137 As shown in the table below paragraph 50, for the same business risk as SHETL and SPTL, the higher gearing proposed for NGET and NGGT would require the cost of equity to be 50 and 79 basis points higher respectively.

## Conclusion

138 When we refine the risk assessment to consider the more material risk factors we conclude that risk is higher than TPCR4 at both the asset risk and equity risk level for both NGET and NGGT.

139 Compared to SHETL and SPTL the picture is more balanced but the higher notional gearing assumption and risks associated with the System Operator function are sufficient to conclude that equity risk is higher for NGET and NGGT.

# Implied asset betas

140 The previous section reviewed and amended Ofgem's risk assessment. In this section we consider the Initial Proposals from an economic perspective. The Energy Networks Association engaged Oxera to review the Initial Proposals. Their report, 'RIIO-T1 and GD1 Initial Proposals: Financial Issues' is provided as an appendix to our consultation response and this paper.

141 That report considered a number of issues including the components of return, Ofgem's assessment of relative risk, and the cost of debt index. This section summarises some of their findings relating to the relative risk assessment.

142 Companies within the same sector have traditionally been given the same financial package. One of the principles of RIIO is that the allowed return can differ across sectors and within sectors if there are material differences in cash flow risk. As Oxera state, this revised approach is appropriate "provided there is robust evidence of material differences in business risk."

143 Oxera's report calculates the asset betas implied from the cost of equity and gearing assumptions in the Initial Proposals, where asset beta is considered to be the most appropriate way of assessing the risk characteristics of a company, independently of the financial structure.

144 Their findings (table 3.1 of their report) are reproduced below:

| | Electricity Transmission | | Gas Transmission | Gas Distribution |
|---|---|---|---|---|
| | SHETL & SPTL | NGET | NGGT | GDNs |
| Asset beta, RIIO | 0.43 | 0.38 | 0.34 | 0.32 |
| Asset beta, previous price control | 0.40 | 0.40 | 0.40 | 0.38 |

145 The asset betas for all non fast tracked networks are assumed to have decreased compared to the previous price controls. The asset betas for gas transmission and distribution are assumed to be 15% lower.

146 Oxera then consider whether the identified changes in risk support that change in asset beta. They review changes in risk under four primary categories:

(a) Increased length of the price control

(b) Scale of investment

(c) Efficiency incentive rate

(d) Increase in cash flow duration

147 With regard to the length of the price control Oxera conclude that the net impact of a longer price control is to increase risk considering the increased exposure to cost variances relative to allowances which they do not believe to be fully mitigated by uncertainty mechanisms or any changes in regulatory risk.

148 In paragraph 3.12 of the Finance supporting document of the Initial Proposals, Ofgem single out the capex to RAV ratio "as the most significant differentiator of risk affecting

both the asset beta (and, therefore, the cost of equity) and the appropriate level of notional gearing." The Oxera report notes:

(a) The movements in asset beta are not supported by the analysis of the changes in capex to RAV. They identify a number of concerns including the fact that NGET's asset beta is assumed to fall (by 0.02) relative to TPCR4 despite an increase in the capex to RAV ratio, and the differences in asset beta seem disproportionately large given the differences in the capex to RAV ratio (e.g. NGET's capex to RAV is only 2% lower than SPTL yet the asset beta is 0.05 lower (i.e. a reduction of 11%)).

(b) The relationship between capex and business risk is complex and cannot be fully captured by the one capex to RAV metric. This issue was discussed in the previous section on Ofgem's risk assessment.

(c) The scale and complexity of investment only accounts for a small part of the assessment of business risk performed by credit rating agencies (for example Moody's give it a weighting of 4% in their approach)

149 The efficiency incentive rate is another area where a comparison between companies and sectors does not support the implied changes in asset beta:

(a) The efficiency incentive rate for NGET and NGGT is similar to the fast tracked networks yet the betas are 0.05 and 0.09 lower

(b) The GDNs have an average efficiency rate considerably higher than electricity transmission yet their asset beta is lower.

150 With regard to cash flow duration Oxera note that an increase in cash flow duration would be expected to increase the cost of capital yet for NGET the increase in cash flow duration is accompanied by a reduction in asset beta. SPTL and SHETL do see an increase in asset beta.

151 Oxera also review the other risk factors identified by Ofgem and conclude that they do not indicate a reduction in business risk either. It is clear therefore that the combination of equity return and notional gearing proposed by Ofgem is not supported by changes in business risk faced by the networks.

152 The risk (or asset beta) of a regulated network is driven primarily by the regulatory framework. The RIIO framework is shared by each the networks regulated by Ofgem and, while differences in risk do exist, the scale of difference implied by the Initial Proposals is not credible.

153 The asset beta has been increased by 7.5% for SHETL and SPTL who are in the same industry as NGET and face many similar challenges, incentives and uncertainty mechanisms yet the implied asset beta for NGET is more than 11% lower than that of SPTL despite the capex to RAV ratio being only 2% lower. Similarly NGGT's implied asset beta is a massive 20% lower than that of SPTL.

# RORE analysis

154 Within the Finance supporting document Ofgem expresses a number of ways in which it has used RORE analysis and the conclusions drawn from it:

(a) It is used to calibrate the package with a range from the cost of debt to double digit returns

(b) A comparison of the RORE range across companies and sectors has been used as a sense check of Initial Proposals.

155 Ofgem acknowledge in paragraph 4.14 that the range does not fall as low as the cost of debt but the variability in annual returns is such that the package is still considered to be appropriately calibrated.

156 Our focus has therefore been on the RORE comparison between transmission networks. As part of this we have reviewed and re-performed the modelling performed by Ofgem. In doing this we identified a number of issues which we have corrected for in the results presented below. We have then presented the results of the RORE analysis for different levels of notional gearing.

## Ofgem's RORE modelling

157 Through our engagement with Ofgem we obtained the model they used to calculate the RORE range. Through our review we identified a number of issues as follows:

(a) Incentives which have been modelled incorrectly in that the modelling is inconsistent with the Initial Proposals

(b) Incentives which have been omitted from the analysis

(c) Inconsistencies and errors in the RORE modelling for the fast tracked networks which has been used as a comparator to NGET and NGGT

### Inconsistencies with the Initial Proposals

158 There are a number of incentives which have been included in the RORE modelling but do not quite match the form of the incentives as we understand them from Initial Proposals. Examples include:

(a) Totex performance was taxed in the model, i.e. the RORE impact has been modelled after applying corporation tax. The sharing factor is a post tax rate and therefore the tax adjustment is not required and has been removed in our modelling.

(b) The energy not supplied and environmental (SF6) incentives both require the application of the totex sharing factor. This was omitted from Ofgem's model.

(c) The Ofgem analysis includes an incentive for late delivery yet paragraph 7.72 of the Output, Incentives and Innovation strategy document discounts such an incentive. Late delivery would potentially be penalised as a licence breach resulting in a potential fine but since this is not an incentive scheme, it should not be included in the RORE analysis.

(d) The Ofgem analysis includes the potential for a downside outcome on permits when no such potential exists according to paragraph 3.27 of the Output, Incentives and Innovation strategy document. The Initial Proposals only include provision for a single year scheme, however Ofgem's analysis includes a potential outcome for all years of RIIO. We have retained this in the RORE analysis as we expect a scheme to be agreed for the subsequent years.

## Omissions from the analysis

159 The Ofgem modelling includes the System Operator (SO) RAV in the denominator. However the SO incentives are excluded from the numerator. Since the SO RAV is too small for a return on the RAV to fund the risks of the System Operator, and Ofgem has chosen to set the same financial parameters for SO and TO, it is appropriate to include in the RORE analysis both the TO and SO activities and incentive schemes.

160 We have therefore added the following incentives:

(a) BSIS (NGET)

(b) Shrinkage, demand forecasting, residual balancing, maintenance and outage planning, and delivering capacity and connections (NGGT)

161 For all of the SO schemes we have assumed a zero mean net expected outcome. In modelling the BSIS scheme we have assumed a potential upside of £25m consistent with the maximum reward available for the 2013/14 proposed arrangements, and a downside equivalent to 10% of cost multiplied by the sharing factor (consistent with the treatment of totex).

162 The choice of expected mean outcome influences the absolute level of RORE available but makes no difference to the magnitude of the range of outcomes. The results that follow have focussed on the range of outcome.

## RORE modelling for the fast track networks

163 The RORE model provided by Ofgem excludes the data for the fast tracked networks. Based on further engagement with Ofgem we understand that the RORE range for the fast tracked networks was sourced from the financial model issued with their final proposals earlier in the year, updated to remove an incentive for unplanned outages.

164 There is clearly a risk that the RORE calculations may be inconsistent between the fast tracked networks and networks subject to the initial proposals when different models are used to perform the RORE modelling.

165 Indeed we have discovered a number of errors in the Initial Proposals analysis which we have corrected for the purposes of this response. Some of these errors are similar to those identified for the modelling of NGET and NGG (e.g. including a late delivery incentive and taxing the totex performance).

166 Other inconsistencies include:

(a) The revenue numbers used to derive several of the incentive impacts are on a different basis between the fast tracked and the non fast tracked networks.

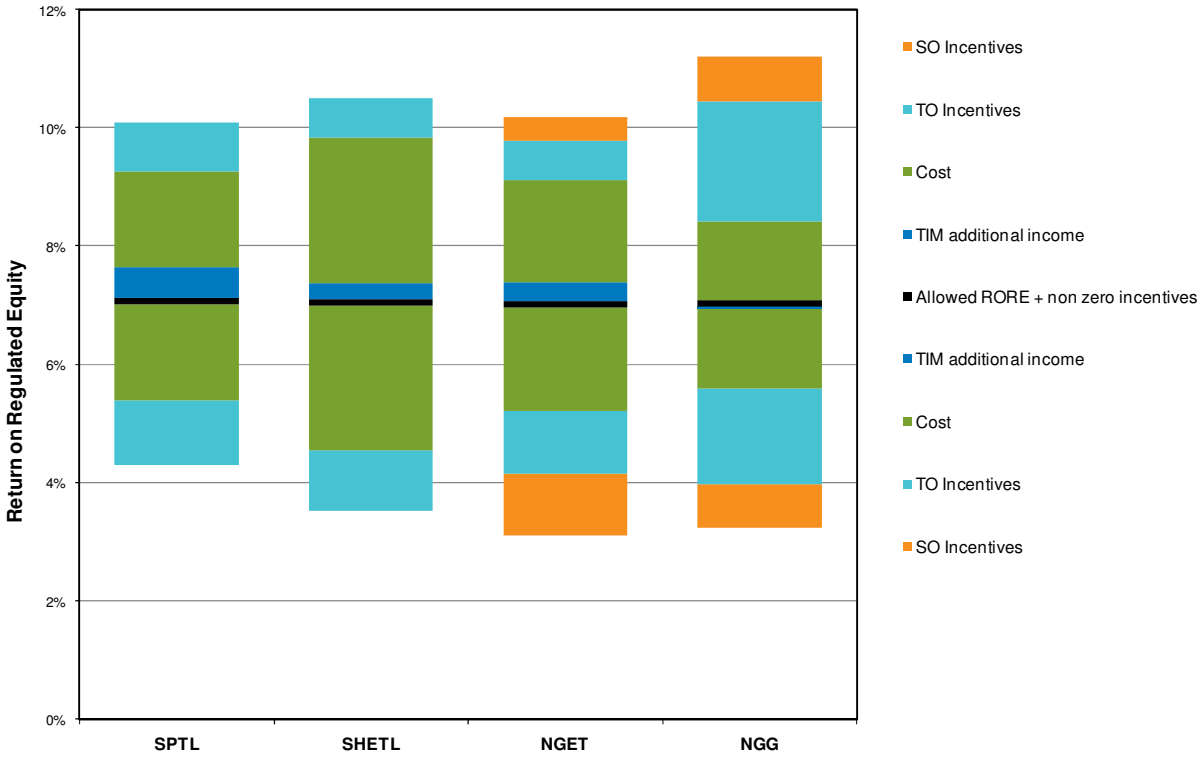
(b) SF6 incentives were omitted from the fast tracked networks RORE analysis.

167 We have re-performed the modelling of the fast tracked networks and shared our workings with Ofgem.

## Updated modelling

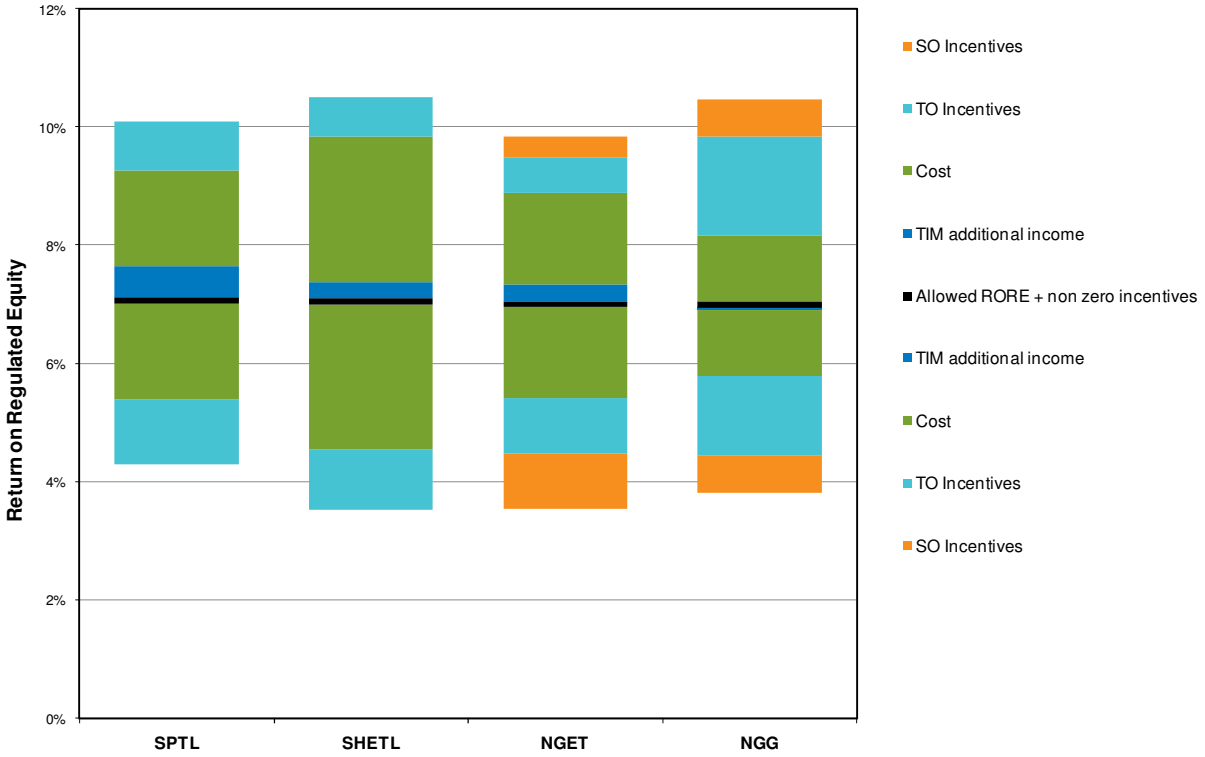
### 'Best view'

168 The chart below shows an updated analysis of RORE for the 'best view'.




169 The chart shows a range between the low and high points of the RORE range of 6.98% for NGET (10.14% less 3.16%) and 7.87% for NGGT (11.16% less 3.29%). This compares to 5.70% for SPTL and 6.88% for SHETL respectively. The range is therefore wider for both National Grid networks.

170 The chart below shows the results if gearing is set to 55% for all networks.




171 At this point the range for NGET falls to 6.20% and NGGT is 6.56%, both between the ranges for the fast tracked networks and considerably higher than for SPTL.

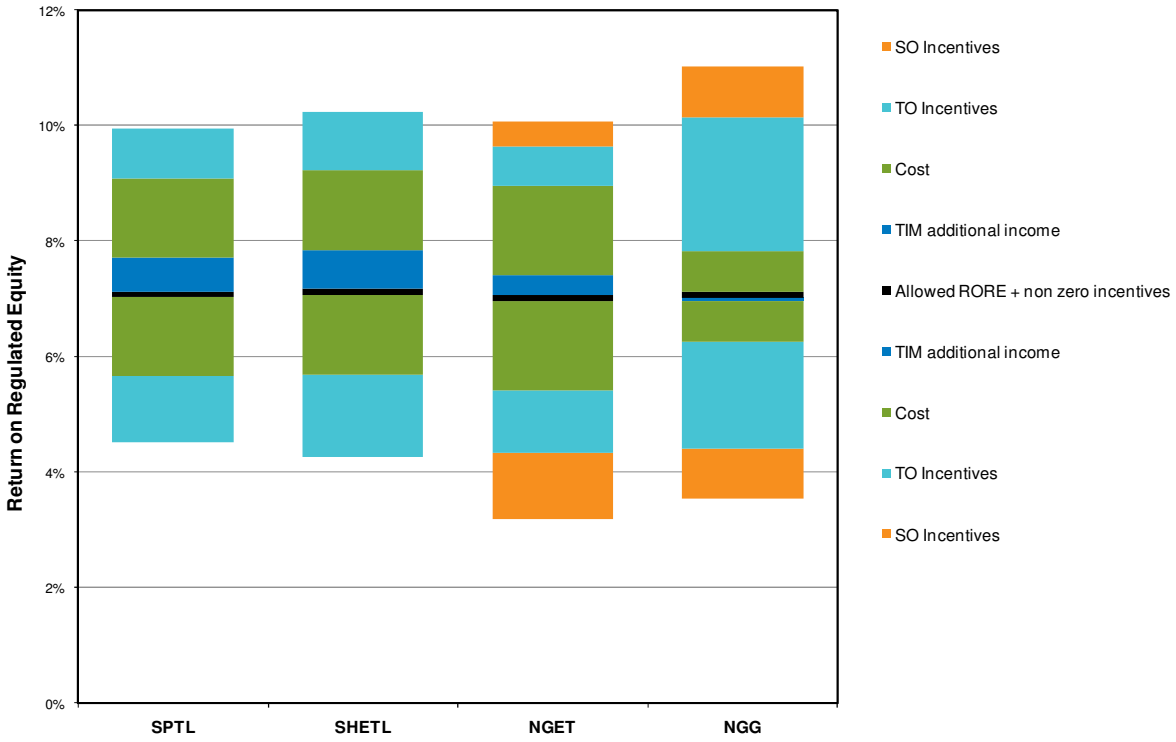
172 If anything we believe these results understate the true relative picture for National Grid because:

(a) The SHETL range is based on a 'best view' that includes a high volume of SWW schemes which are acknowledged to be lower risk than other capex. If the current assumption of a totex over / under spend of 10% was modified to reflect the higher risk of base and volume driver allowances, the ranges of NGET and NGGT would be wider relative to SPTL and SHETL.

(b) The NGGT range is based on Ofgem's best view which, as explained in paragraphs 65 to 70, is inconsistent with Ofgem including the full SWW spend for the electricity networks. Presenting the results on a comparable basis would increase the range for NGGT relative to all of the other networks.

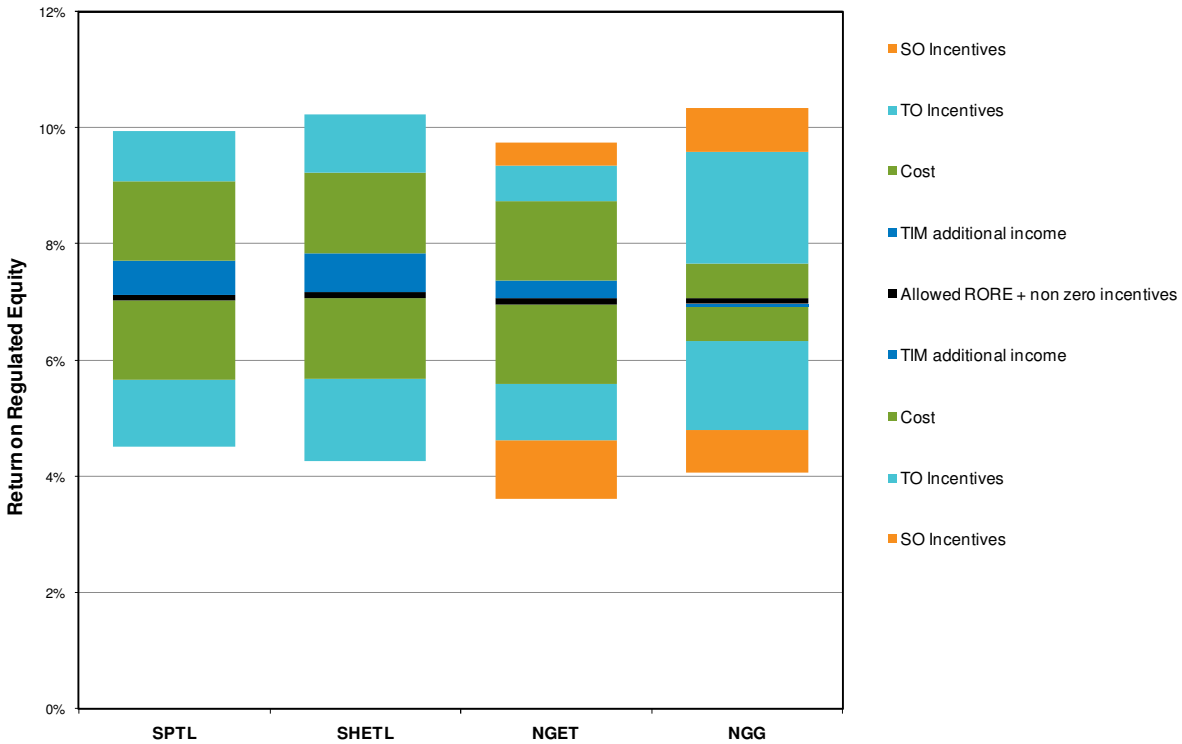
## 'Base view'

173 The chart below shows an updated analysis of RORE for the 'base view'.




174 The chart shows a range between the low and high points of the RORE range of 6.79% for NGET (10.03% less 3.24%) and 7.40% for NGGT (10.99% less 3.59%). This compares to 5.33% for SPTL and 5.88% for SHETL. The range is therefore significantly wider for both National Grid networks.

175 The chart below shows the results if gearing is set to 55% for all networks.



176 At 55% gearing the range for NGET falls to 6.03% and NGGT is 6.17%. So even if gearing is set to 55% for all four transmission networks, the range of outcomes for RORE is larger for NGET and NGGT. The range for NGET and NGGT is considerably larger than that for SPTL

177 These results indicate that an appropriately calibrated package would set gearing to 55% for both NGET and NGGT, consistent with the rates of gearing used for the fast tracked networks. Such a package would produce more comparable ranges for RORE than the currently proposed packages.

# Conclusions

178 Ofgem has previously recognised that it is in consumers' interests to ensure the financial package is not deficient. If the financial position of a network deteriorates, the costs of financing that business increase and could ultimately impact on its ability to invest appropriately in the network.

179 Companies within the same sector have traditionally been given the same financial package. One of the principles of RIIO is that the allowed return can differ across sectors and within sectors if there are material differences in cash flow risk. This approach is appropriate provided there is robust evidence of material differences in business risk.

180 National Grid provided detailed risk modelling as part of our business plan. This modelling quantified the uncontrollable risks facing the networks and demonstrated an increase in risk relative to TPCR4. This would indicate an increase in the asset beta and a requirement for an increase in the WACC relative to TPCR4 (for a given cost of debt). Indeed the Final Proposals for the fast tracked networks did imply an increase in asset beta from 0.40 to 0.43, consistent with expectation.

181 Ofgem has not engaged with us on the detail of our modelling so the Initial Proposals represent our first opportunity to gauge Ofgem's views on risk. Unfortunately we find Ofgem's risk assessment to be deficient in several respects:

(a) It is not backed by robust analysis or evidence

(b) The subjective risk assessment presented in the Initial Proposals omits a number of important risk factors and in other cases fails to adequately reflect the detail of Initial Proposals.

(c) It does not support the scale of asst beta implied by the financial package proposed

182 Ofgem has not performed any cash flow risk modelling of their own to support their analysis. Instead, their conclusions are based on a tabular summary of a number of risk factors. The subjective risk assessment fails to consider a number of key risk drivers including:

(a) The risks associated with the System Operator (SO) activities (risks which Ofgem does not remunerate through the SO control)

(b) The duration of cash flows

(c) The difference between ex ante allowances and within period determinations, and

(d) Notional gearing

183 Also, where risk factors are considered we typically find that elements of the regulatory package are double counted or simply do not reflect the detail of the Initial Proposals. We have presented an alternative risk assessment and explained why NGET and NGGT both face higher risks than under TPCR4 and higher risk relative to both SPTL and SHETL.

184 Not only do we find that Ofgem's risk assessment contains errors and omissions and is not backed by robust analysis but the financial packages proposed are not credible from an implied risk perspective.

185 On behalf of the Energy Networks Association, Oxera reviewed the changes in asset beta implied from the proposed cost of equity and gearing assumptions, both across time and between sectors. They find that the movements in asset beta are not substantiated by the evidence presented.

186 By way of example, the scale of capex to RAV is considered the biggest driver of risk in Ofgem's proposals yet NGET's asset beta has fallen by 5% relative to TPCR4 despite an increase in the capex to RAV ratio, an increase in the totex sharing factor, an increase in the length of the price control and an increase in cash flow duration. It is not credible to set a financial package that implies a reduction in risk when risk has actually increased.

187 Similarly, the risk (or asset beta) of a regulated network is driven primarily by the regulatory framework. The RIIO framework is shared by each the networks regulated by Ofgem and, while differences in risk do exist, the scale of difference implied by the Initial Proposals is not credible.

188 The asset beta has been increased by 7.5% for SHETL and SPTL who are in the same industry as NGET and face many similar challenges, incentives and uncertainty mechanisms yet the implied asset beta for NGET is 11% lower than that of SPTL even though the capex to RAV ratio is only 2% lower. Similarly NGGT's implied asset beta is a massive 20% lower than that of SPTL.

189 We therefore conclude that the proposed financial package fails to recognise and adequately remunerate the risks faced by both NGET and NGGT during the RIIO-T1 period.

190 Ofgem also uses RORE analysis as a sense check that the financial package is appropriately calibrated. On reviewing the RORE analysis we identified a number of issues as follows:

(a) Incentives which have been modelled incorrectly in that the modelling is inconsistent with the Initial Proposals

(b) Incentives which have been omitted from the analysis

(c) The inclusion of entries for a late delivery incentive where no such incentive exists

(d) Errors and inconsistencies in the modelling of the fast track networks which has been used as the comparator against which the proposed packages have been judged

191 We have provided evidence within this paper to demonstrate that, once the appropriate corrections have been made, the currently proposed financial packages result in a range of RORE outcomes that is far wider for NGET and NGGT than the fast track networks. Reducing gearing narrows the range of outcomes to make them more consistent.

192 We find that if gearing is set at 55% for each of NGET and NGGT the range of RORE outcomes is still higher than the fast track networks for the 'base view'. For the 'best view, the range is lower than that for SHETL but considerably higher than for SPTL.

193 We therefore conclude that:

(a) NGET and NGGT face higher risk than TPCR4, SPTL and SHETL and should receive a higher WACC accordingly.

(b) Corrected RORE analysis suggests that a well calibrated package requires gearing to be reduced to 55%

(c) Notional gearing should be reduced to 55% and the cost of equity increased to achieve a more appropriate balance of risk and reward.