RIIO-2 CHALLENGE GROUP INDEPENDENT REPORT FOR OFGEM ON RIIO-2 BUSINESS PLANS

24 January 2020

Electricity and Gas Transmission, Gas Distribution and Electricity System Operator sectors

1 Contents

Executive Summary

Ofgem established the RIIO-2 Challenge Group in September 2018 with the objective of providing challenge to the energy network companies on their Business Plans for RIIO-2 and to Ofgem on its framework for RIIO-2, on behalf of existing and future consumers.

This report outlines our independent views for Ofgem on the energy network company Business Plans for RIIO-2. The report is intended to support Ofgem's work towards its Final Determinations of the revenue required by these network companies to operate their businesses in the future, but we hope it will also be of use to anyone participating in the Ofgem's Open Hearings process in 2020.

Our views are based on extensive engagement with the companies throughout 2019. This includes our reviews of their final plans submitted in December, their draft plans submitted in July and October and their historic performance, and their joint analysis of the future energy common scenarios. We have worked closely with Ofgem, the Customer Engagement Groups (CEGs) of the gas distribution companies and the User Groups (UGs) of the transmission companies and the Electricity System Operator (ESO), but are independent of all of them.

Ofgem asked us to comment on the quality of the Business Plans. In our view, the quality of the plans submitted to Ofgem in December has substantially improved from the earlier drafts that were submitted to us for scrutiny. However, there are still significant differences between them, the better plans being those of Scottish Power Electricity Transmission (SPT) and Northern Gas Networks (NGN) and the least convincing those of National Grid Electricity Transmission (NGET) and Scottish Hydro Electricity Transmission (SHET).

We have summarised our findings thematically below and in much more detail in the body of the report. However, we would like to highlight the following **six key points** for Ofgem

1. After stripping out expenditure related to the load on their systems, the companies are asking for an **additional £4 billion**[1] of expenditure compared to RIIO-1, representing around a 20% increase. We don't think an increase of this size has been, or indeed can be, justified. The transition to Net Zero could require a substantial increase in expenditure on the electricity network in due course, but that is not a major factor in these expenditure plans, which are still based to a large extent on business as usual (expenditure to facilitate the energy transition is generally additional, and dependent on future policy decisions). And we believe that there is scope for significant improvements in efficiency.

2. Given the huge transformation that will be required in energy networks to implement energy transition we are disappointed that no company, apart from the ESO, has been genuinely proactive in shaping **the path to Net Zero.**

3. A significant area of expenditure for the gas distribution network companies is the Health and Safety Executive (HSE) **mandated Repex programme (over £3 billion during RIIO-2)**[2]. This policy was last reviewed by HSE and

[1] The majority of this is attributable to electricity and gas transmission companies

[2] Includes replacement of Tier 1 mains, Tier 2A mains, steel mains <2" in diameter and associated services.

Ofgem in 2010. We think there is a strong case for an urgent review of this programme by HSE and Ofgem, to ensure consumers pay only for what is necessary, based on the latest risk information available and taking account of the projected fall in gas demand.

4. Despite vigorous protestations from every company, none has persuaded us that Ofgem's working assumptions for the **Cost of Capital make their businesses unfinanceable**.

5. In their **output proposals** in the areas of the environment and, for the gas distribution companies, consumers in vulnerable circumstances, some companies demonstrated much needed ambition. But the costs are significant and the justification was often unclear. We are also not convinced that the companies' **Consumer Value Propositions** demonstrate significant additional value for consumers overall, although a few individual proposals might have merit.

6. The **ESO** will have a critical role in this new world, but it is still unclear precisely what that role is, and in particular the relative responsibilities of the ESO and the Transmission Operators. While the ESO plan shows encouraging ambition, we do not believe it is proactive enough in ensuring that the key issues for energy transition are addressed, and the benefits from whole system planning are realised. We also raise questions about its ability to deliver its IT change programme, which is much larger and more challenging than what it has done in the past.

Our role in the planning process

An important part of the planning process was the requirement for the companies to provide us with full drafts of their plans in July, and again in October. This was to enable us (and the CEG/UGs) to assess the plans, and to provide feedback to the companies before the submission of the final plans in December to Ofgem. For the assessment of the plans, in particular for the calculation of the Business Plan Incentive (designed by Ofgem to encourage high quality plans), Ofgem asked us to provide a view on how well the companies had engaged with us and on the quality of the draft plans.

July and October draft Business Plans

The quality of the July draft plans was generally low. There were gaps in the information provided and insufficient justification supporting the expenditure figures. The October drafts showed mixed levels of improvement, although they were all still incomplete to a greater or lesser extent, and there was significant variability across the companies.

Final Plans

Some companies provided a great deal of new information in December, giving us little time to assess it. Key points of our assessment of the final plans include:

Stakeholder engagement: All companies are committed to engaging stakeholders in their businesses, and some propose enhanced engagement strategies that will upgrade their approach considerably. However, our overall assessment is that there is still a considerable way to go before stakeholder engagement is fully embedded in

these companies and routinely driving decisions at all levels, from the Board to the front line. It is essential that this transformation continues at pace, and in advance of RIIO-2.

Customer outputs: Many early drafts failed to provide any meaningful cost benefit analysis (CBA) for their proposals or evidence that alternatives had been considered. While final plans did fill in most of these gaps, this late delivery meant that we did not have time to analyse the proposals as fully as we would have wished.

Resilience outputs: We were not able to access cyber resilience plans for security reasons, but this is an area which merits particularly close scrutiny by Ofgem, given both its importance and the substantial increases proposed by some companies. On asset resilience a few companies did not provide enough evidence for us to be confident that they had adequate knowledge of asset health

Consumers in vulnerable situations: The gas distribution companies generally showed a good understanding of vulnerability and how to support their customers. Cadent has shown real ambition in this area compared to other gas distribution companies and could raise the standards across the sector if it can deliver it.

Environment/Net Zero/Whole systems: The RIIO-2 environmental requirements for the companies' own operations have been significantly strengthened and all companies have upped their game relative to RIIO-1. However, although there are some stretching targets, there is much in the plans which does not go significantly beyond compliance with current or likely future regulatory requirements.

More widely, Government's ambitions for Net Zero by 2050 (2045 for Scotland) represent a huge new challenge for the sector, and one which fully emerged only in July. We recognize that achievement of the Net Zero goal will require a co-ordinated policy covering the whole energy system, and it is not at present clear who will drive that policy. Even within the energy network sector there is no agreed view as to where whole system leadership should sit, and there is huge uncertainty around the optimal pathway to Net Zero. We have taken the view, informed by Ofgem guidance, that companies should consider a wide range of pathways and should be encouraged to set up joint working parties and pilot projects to inform and enable rapid implementation of policy as it emerges.

All the companies have responded to the challenge to some extent. However, none has shown true leadership. Whole system thinking in particular needs further development and very few companies have fully engaged with the wide range of potential paths which may be required to meet Net Zero, particularly as it is for all a game-changing, and for some, an existential, issue.

Digitalisation plans: Companies demonstrated varying levels of ambition and capability in this area. The best performers provided a clearly defined plan setting out the aims and scope for digitalisation plans within their business, including the costs and benefits associated with these initiatives, and a delivery plan. They were already well advanced in terms of implementation and enabling wider access to data. The weaker plans had a tendency to be internally focused, ignoring the wider and external opportunities for plans to add value.

Uncertainty mechanisms: There was a wide variation in the quality of the proposals for uncertainty mechanisms. The stronger performers proposed a limited number of

uncertainty mechanisms, giving us more confidence that they were not unduly passing on to consumers risks that they themselves were best placed to manage, although even for these companies further review of the detail is needed to ensure that the balance of risk is appropriate. The weaker performers proposed a wide range of additional uncertainty mechanisms, in which risks that the companies were better placed to manage, were passed on to consumers. Where uncertainty mechanisms are likely to be needed, such as for generation connections and associated reinforcements, a particular area of concern is to ensure that the design of volume drivers in RIIO-2 is better than that in RIIO-1.

Innovation: all companies provided detailed innovation strategies and plans, demonstrating how they were collaborating with third parties. The better companies demonstrated how their prior efficiencies were being deployed in RIIO-2. Most innovation funding is being sought from NIA or other sources. While a number of companies indicate they will provide their own Totex funding for some elements of innovation, we are sceptical that this represents anything more than business as usual efficiency initiatives.

Competition: while all companies carried out a competition assessment, the main projects indicated for competition comprised those already identified by the ESO's Network Option Assessment (NOA) process. Few other projects were identified as being suitable for competition, which was disappointing. We think companies could have been more proactive and have suggested where competition could be extended. All companies provided reasonable native competition plans.

Efficiency: The efficiency improvements proposed ranged from around 0.5% to 1% pa (the company with the highest proposed efficiency gain also proposed a big increase in Totex). We do not think that any of the companies has been sufficiently ambitious in this area, particularly given the efficiency improvements claimed by the companies to explain Totex underspends in RIIO-1.

Costs: There is a wide range of proposed changes in Totex, compared with RIIO-1 (ET: -6% to 16%, (but once ET is adjusted for load related expenditure the increases are 16% to 149%), GT 54%, GD 1% to 9%). The main upward cost drivers are asset health, mandatory spend and IT/cyber spend. Total Totex (after adjustment to remove load related expenditure) increases by £4.1 billion or 23% between RIIO-1 and RIIO-2. The majority of this increase is attributable to NGET, SHET and NGGT and their forecast increases in asset health expenditure.

We are also concerned by the overall level of IT and related expenditure (some £3 billion) in such a mature industry, even allowing for the growing demands of cyber security and the ESO's role, and question whether much of it is being efficiently designed, procured and implemented. We note in particular the wide differences between companies for this expenditure, with National Grid owned companies accounting for some £2 billion of the total.

We found significant data problems in assessing the expenditure plans of two of the ET companies. For NGET it was difficult to calibrate planned expenditure against its track record, while for SHET, where the bulk of the higher expenditure relates to asset health issues, we were disappointed that this information was only provided in December, giving us limited visibility of potential evidence to support the spend levels.

For NGGT, where much of the increase comes from IT and security costs, we have been hampered again by a lack of comparability between proposed and historic spend, and by the (unavoidable) lack of visibility on cyber security plans. We think that there may be lower cost approaches to cyber security (e.g. by limiting the connectivity of control systems). And on asset health we are not convinced that increases in expenditure over RIIO-1 are justified by mandatory or reliability requirements. We are also not convinced that opportunities to reduce expenditure in response to declining network utilisation have been fully considered.

Cost increases in the gas distribution companies are generally lower and better justified (the apparent outlier seems to be due to inclusion of enhanced customer outputs), partly because of the ability to compare the four companies, though we feel that there are further efficiency savings that could be delivered. We are also not convinced that the potential fall in peak gas demand indicated by, for example, the SGN NIC project has been taken account of, or even acknowledged by, the companies.

More widely we believe there is a case for asking HSE to revisit its mandatory gas main replacement programme. It is 10 years since the last review, in which time the number of gas explosions has fallen significantly. Any reduction in mandatory Repex would hugely reduce costs. We note that Ofgem has said it will include an HSE reopener in RIIO-2 and we would expect this to address any potential changes to HSE regulations or policy that may result from any such review.

Engineering justifications and Cost Benefit Analysis: This is an area where some companies provided substantial amounts of information for the first time in the final Plans, which created obvious problems for our assessment. We recommend that Ofgem carries out significant further analysis in this area. We were looking for evidence that the engineering analyses were based on specific projects and corroborated by asset condition evidence. In this respect most companies provided reasonable evidence except NGET, where we felt the evidence was weaker due to the generic nature of its evidence and proposals. The majority of SHET's submissions were provided in December, leaving limited time for review.

However, even with the companies providing better evidence, we had some reservations as to whether all intervention options had been fully considered and felt that unit costs, timings and volumes were higher than necessary. For gas networks, we think that interventions for non-mandatory projects with long payback periods should be reconsidered given the expected future decline in gas capacity utilisation.

Financeability: Almost none of the July Draft Plans were based on Ofgem's Working Assumptions and, although compliance had improved in October, there was still little focus on achieving financeability at low cost to the consumer. The emphasis then, and again in the final plans, was almost entirely on the higher cost option of an increase in the Cost of Capital allowances.

Overall, there was little evidence that the companies had actively sought to achieve financeability on the basis of Ofgem's 4.8% Cost of Capital assumption and even less at the 4.3% level. Target ratings were insufficiently justified and, despite requests from ourselves, there was no evidence that companies had exhaustively explored measures to achieve financeability that were at lower cost to the consumer than an increase in the cost of the capital allowance. Most companies explored the sensitivity analysis which they had performed in some detail but failed to use that

information to support an appropriately nuanced and considered approach to financeability.

Consumer Value Propositions: The concept of CVP as a measure of quality was a late addition to the RIIO-2 methodology, with the Business Plan Guidance continuing to evolve between June and end of October. We have sought to identify CVP proposals, which provide additional value for consumers and go beyond what should in our view be regarded as Business as Usual for network companies or which offer an output which stands out as best in class. We have not found that any of the CVP propositions, viewed as a whole, presented a clear case of additional value for consumers, although we consider that a few elements in some plans may deliver additional benefit. At the same time we feel that in areas such as provision for consumers in vulnerable circumstances, service standards and environmental initiatives, Ofgem will need to evaluate and benchmark the total package of outputs offered by each company, rather than focusing on individual proposals so that additional value can be assessed in the context of the whole package.

Assurance of the Business Plans: No company provided a wholly satisfactory statement about the alignment of management remuneration arrangements and Plan outputs. Where there was mention of alignment, being either in place or, more often, proposed, detail was limited.

Open Hearings

The key six points inform our suggestions to Ofgem for Open Hearings, which we have covered in further detail in the report.

1. Introduction

Purpose

The RIIO-2 Challenge Group (we, us, the Group) was established by Ofgem in September 2018 with the objective of providing effective challenge, to the energy network companies and to Ofgem, on behalf of existing and future consumers. It was intended that we should strengthen the voice of consumers in the price control process by providing an independent challenge to, and scrutiny of, the Business Plans to be developed by the network companies[3], with a focus on sustainability, affordability and the protection of vulnerable customers. As part of this primary purpose, the Group is expected to participate in the Open Hearings and review Ofgem's initial determination in the summer of 2020. Our Terms of Reference also provided for us to engage with Ofgem's policy thinking in the run up to the publication of its Sector Specific Methodology Consultation in December 2018 and Sector Methodology Decision in May 2019. As required by our Terms of Reference, the primary output from our work is this independent report for Ofgem, which contains our review of each company's Business Plan and overarching commentary on common themes, together with recommendations for the forthcoming company Open Hearings.

The Group consists of thirteen members, three appointed by Ofgem to represent specific organisations and the others appointed following an open recruitment process using a recruitment agency focussing on specific expertise. The members are Roger Witcomb (Chairman), Clare Potter (Deputy Chairman), James Richardson (National Infrastructure Commission), Judith Ward/Sharon Darcy and latterly Martin Hurst (Sustainability First), Victoria Macgregor/Gillian Cooper/Stew Horne (Citizen's Advice), Goran Strbac, Robert Hull, Ulrich Kaltenbronn, Joanna Hubbard, Helen Parker, Rosamund Blomfield-Smith, Alan Bryce and John Baldwin (appointed in December 2018).[4]

The Group has Terms of Reference[5] , which are available on Ofgem's website. As per our Terms of Reference, we are accountable, to the extent of appropriately taking account of our independent status and in accordance with these terms of reference, to the Senior Responsible Officer of the RIIO-2 price controls (Akshay Kaul). We have also published our work plan, meetings dates and minutes on the Ofgem website. To ensure confidentiality across plans, the minutes were noted and published accordingly. A conflict of interest register is maintained and was updated as appropriate. The Chair and deputy Chair of the Group also participated in quarterly meetings with Ofgem and the chairs of the Customer Engagement Groups and User Groups.

We established five sub-groups to ensure that the specialist expertise of individual members of the Group was brought to bear on the corresponding area of the Plans. Each sub-group had a Chair and all Chairs reported into the Group Chair. These five sub-groups covered:

[3] By network companies we mean Electricity and Gas Transmission, Gas Distribution companies and Electricity System Operator.

[4] Members biographies can be found here: https://www.ofgem.gov.uk/publications-and-updates/riio-2-challenge-group-members-biographies

[5] Terms of Reference of the RIIO-2 Challenge Group can be found here.

- engineering, resilience and costs;
- engagement and outputs, including provision for vulnerable consumers, environment;
- energy transition and the path to Net Zero, whole systems, competition and innovation; and
- financeability of the Business Plans;
- Electricity System Operator.

We are grateful for the help we have received from Ofgem on technical support, matters of factual accuracy and regulatory procedure. We are also grateful for the strong and committed support provided by our secretariat function led by Rupika Madhura, with technical and administrative support from Ofgem personnel as necessary.

Our engagement with Ofgem to challenge its policy thinking

As set out in our Terms of Reference, an important part of our role is to engage with, and provide challenge to, Ofgem's policy thinking from the perspective of the RIIO-2 Objective in the run-up to Ofgem's sector methodology consultation in December 2018 and Sector Methodology decision in May 2019. We are also required to review the initial determinations published by Ofgem in summer 2020, and as part of the broader consultation on these, challenge and advise Ofgem if any aspects of these determinations may not be in accordance with the RIIO-2 Objective. Ofgem has stated it will take into account our views before setting final determinations later in 2020.

We considered it an important part of our remit to provide a robust challenge to, and sounding board for, the development of Ofgem's thinking in relation to the RIIO-2 sector methodology. To that end, we responded on 18 March 2019 to the RIIO-2 Sector Specific Methodology Consultation issued by Ofgem on 18 December 2018. In that response, we supported the focus on delivering low cost, reliable, sustainable and consumer-focused outcomes and urged Ofgem:

- to send a tougher message on costs and the importance of plan delivery;
- to put greater emphasis on energy transition and the path to Net Zero;
- to make it clear that the cost of capital should reflect the risk/return profile of the whole regulatory settlement, including the package of incentives;
- to send a stronger message on the environment and sustainability;
- to look carefully at the balance of risk between that borne by consumers and that borne by the companies.

In parallel, we also responded to Ofgem's consultation on its Business Plan Guidance to the network companies. In responding (on 22 February 2019) to Ofgem's RIIO-2 Business Plan Guidance consultation, the Group:

- strongly supported the requirement for the submission of full drafts on 1st July and 1st October and the need for changes between drafts to be logged;

- supported the proposal that our assessments should inform Ofgem's Business Plan assessments and determination of Business Plan Incentive payments and penalties;
- suggested a greater focus on plan deliverability;
- emphasised the importance of Ofgem setting out a clear specification in relation to the structure (sections and sub-sections) of Plans to aid clarity and comparability;
- underlined the importance of governance and of full Board (and, where relevant, investor) support for Business Plans.

Our approach to engagement with the companies and their enhanced engagement groups

Our engagement with the companies has been with a view to ensure that the final plans submitted on 9 December 2019 to Ofgem fulfilled the requirements set out in our Terms of Reference. Our comments, observations, challenge and feedback to the network companies on their plans were advisory but we have made clear from the outset that we expect our report to Ofgem, with our views on the engagement of the companies with us and on quality of the Business Plans, to inform Ofgem's assessment of Business Plans.

We also felt it important, and found it to be very useful, to engage regularly with the independent Customer Engagement Groups and User Groups established by each company. We had an introductory meeting with the Chairs of all the Customer Engagement Groups and User Groups in October 2018. Our Chair since then regularly met the Chairs of these Groups through the quarterly meetings organised by Ofgem. We have also maintained contact through structured monthly telephone calls between a member from our group allocated to each company and the chair of the relevant Customer Engagement Group/User Group. These calls have been reported and logged. We also invited the Chairs of the Customer Engagement Groups and User Groups (along with any relevant members) to attend all our meetings with the companies.

We are grateful in particular to the Chairs of the Customer Engagement Groups and User Groups for their engagement with us throughout the process to date.

Structure of report

Our report is for Ofgem. However, we are aware that wider stakeholders (including the companies) may wish to consider our report especially for the purposes of the Open Hearings conducted by Ofgem on the RIIO-2 Business Plans in March/April 2020.

After the Executive Summary and this introductory section, our report is set out as follows:

- Section 2: our approach to assessment of the Company Business Plans, their use of the output of the ENA future scenarios working group; our engagement with the Companies on their historic performance; and a brief account of our challenges to the draft plans submitted on 1st July and 1st October;

- Section 3: a commentary on the key themes and the way in which different companies have dealt with them;
- Section 4: recommendations in relation to topics for the Open Hearings;
- Section 5 - 13: individual Company assessments.
- Annexes.

2. Our assessment approach for Business Plans

Approach to scrutinising the plans

In February 2019, we issued our priorities and work plan document[6], which also set out our expectations for the draft July and October 2019 RIIO-2 Business Plans for the RIIO-2 Challenge Group. In line with our objective and primary purpose we agreed to focus our scrutiny of Business Plans for RIIO-2 on the following key areas:[7]

- Stakeholder engagement
- Outputs and incentives (in line with the Ofgem RIIO-2 Framework this encompasses outputs relating to consumers in vulnerable circumstances and environmental outputs which were both areas of specific focus)
- Costs
- Finance, including financeability and risk
- Enabling competition
- Energy transition, including whole system and decarbonisation
- Digitalisation
- Innovation
- Deliverability of plans including competency, commitment and culture.

We decided (and communicated to the companies) that we would assess these areas of plans against the criteria set out in Ofgem's Sector Specific Methodology Decisions and Business Plan Guidance, rather than imposing our own assessment requirements on the companies. Within each of these areas, we had a specific approach to assessing the plans, which is highlighted in Section 2 of this document. Overall, we have taken into account the ambition of each plan, value for money, engagement with stakeholders (including us) and delivery confidence.

In order to assist with Ofgem's assessment in relation to the Business Plan Incentive for RIIO-2, which is designed to reward companies with high quality plans, we have sought to indicate where we think there is information missing or where plans are incomplete or not supported by evidence, where cost forecasts do not seem well justified and areas of concern for Ofgem to probe further. We have commented on the overall quality of the Consumer Value Propositions and highlighted some specific proposals, which we think merit further consideration. Silence on any issue should not be taken to imply approval, nor a lack of importance.

Our scrutiny of the plans has been conducted primarily on the basis of the main company draft and final Business Plans and limited review of the extensive supporting materials, supplemented by face to face sessions with the companies and the provision of some additional information.

[6] This is explained on page 5 and 6 of our priorities and work plan document, can be found here.
[7] This is explained on page 4 and 5 of in our priorities and work plan document issued on 28 February 2019, which can found here.

We welcome this new innovative process of Enhanced Stakeholder Engagement in the RIIO framework to strengthen the voice of consumers. We understand, as this process is new, every party involved (including Ofgem) is learning while doing. We have found the timescale for the scrutiny process set by Ofgem challenging and the late changes to sector methodologies (in particular the Business Plan Incentive) and the Business Plan Guidance from Ofgem have contributed to this challenge. Some technical tools and support, such as on the benchmarking of costs, were not available to us as Ofgem was still in the process of constructing these. We consider it important for the readers of this report to keep this context and these limitations in mind when reading this report. We would be happy to participate in any lessons learnt exercise Ofgem decides to undertake on this new process.

Energy Networks Association future scenarios working group

Ofgem set out in its Business Plan Guidance document that it expected networks across all sectors to agree a set of common factors and assumptions to develop their view of the future. The network companies subsequently established a working group through the Energy Network Association (ENA) to consider common future scenarios called the ENA future scenarios working group. Ofgem requested us to consider the output produced by this working group and provide views on it.

We shared our views with Ofgem in May 2019 in a written report, ahead of Ofgem's final decision on sector methodologies for RIIO-2. For transparency, Annex 1 to this report provides a summary of our recommendation to Ofgem in this area.

Historic performance of the companies

Following our introductory meetings with all network companies in late 2018, we asked the companies to provide information on their historic performance. This helped us to prepare for the RIIO-2 Business Plans by getting a better understanding of their businesses, the past and future cost drivers and cost forecasts. All companies responded to the initial briefing requests on time and the information provided has been useful in our subsequent assessment of the company plans especially on costs, resilience and engineering justification.

As an independent Group, we wanted to ensure we listened to both Ofgem and company views on this. In January 2019, we asked each company for a briefing on their historic performance, with specific information submitted to us (no more than 30 pages, excluding datasheets) by 25 March 2019. We also issued supplementary questions to the companies, with a deadline of 24 April (with 15 May 2019 as a deadline for submission of some further background information).

The briefing requests were targeted at understanding:

1. the key characteristics of their businesses,
2. their performance in managing historic costs/driving efficiencies, and
3. key historic cost drivers that will also be relevant for RIIO-2.

At the end of April 2019, we met the companies to ask further questions on the information provided. Each company's Customer Engagement/User Group Chair and members also attended these meetings.

Draft July and October 2019 Business Plans for the Group

Ofgem required each energy network company to submit two complete drafts of the Business Plans to the Group in July and October 2019 respectively, before the companies submitted their final plans to Ofgem in December 2019. This provided an opportunity for all the Groups in Ofgem's enhanced engagement framework to scrutinise the plans at an early stage and provide feedback to the companies as they developed their plans. In our introductory meetings with all the companies in November and December 2018, we made it clear to companies that we expected to see as complete drafts of the plans in July and October 2019 as possible. Where there were omissions, the onus was on the companies to explain to us why that was the case.

Following our review of their July drafts, we met with all the companies to seek explanations/further information in areas where there was a lack of clarity. Following those meetings, we sent each company feedback on its July submission, focussing mainly on omissions and on areas where we felt the plan could be more consumer-focused/robust/ambitious/detailed. We made clear where we expected to see shortcomings addressed in October 2019.

Following our review of the October draft Business Plans, we sent our comments to the companies ahead of our meetings with them at the end of October 2019 to allow companies to take timely account of our feedback for their final plans to Ofgem. Again, our comments focused on gaps in the information provided, and to highlight areas where costs and activities were not adequately explained or justified. Indicative RAG ratings were also provided at this stage to the companies ahead of the final report from us being published. The companies were given the opportunity to make a presentation of their views on our feedback but these meetings were used principally for 'deep dives' into areas of cost and delivery notified to them in advance.

In section 3 and individual company chapters of this report, we provide our views on the quality of each company's draft plans and its final plan and on how it responded to our feedback over the process.

3. Comparative results of scrutiny of plans

Overall comparison

Table 1 summarises and compares our view of the quality of December Business Plans across the nine companies.

The RAG ratings in this table take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the Business Plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is weaker and the company proposals are not acceptable. Our explanatory comments are provided in this report. We have not weighted the elements of the plan.

Table 1: Comparative summary of quality of December 2019 company Business Plans

December plan ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Track record from RIIO-1									n/a
Business plan commitment/assurance									n/a
Stakeholder engagement									
Outputs: vulnerable consumers	n/a	n/a	n/a	n/a					n/a
Outputs: customers									n/a
Outputs: resilience									
Outputs: environment									n/a
Towards NetZero/Whole System									
Digitalisation plan									
Managing uncertainty									n/a
Efficiency									
Costs									
CBA and Engineering Justifications									
Finance									

Rating	
Green	
Amber/Green	
Amber	
Red/Amber	
Red	

Note:
Efficiency for ESO addresses whole system
ESO specific outputs included in ESO section

Theme comparisons

In this section we summarise observations from our comparative view of the plans. We set out the context for our individual company findings by identifying in each thematic area how we have approached the scrutiny of the plans and what we believe are characteristics of better and weaker plans in line with Ofgem's Business Plan Guidance and RIIO-2 Framework (including the Sector Specific Methodology Decisions).

1. Track record

We have scrutinised each company against the evidence it provided in December to explain its track record, with the results shown in Table 2.

Table 2: Track record RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Track record from RIIO-1									n/a

During the entirety of our challenge process, we have considered it important to gain an understanding of each of the companies and their current performance, the company characteristics and their key issues. This information would be critical in understanding future plans.

To this end, early in 2019 we commenced an initiative to seek historic cost and performance information from the companies, which began with common data requests and concluded with a review session that we held with each company in spring 2019 prior to receipt of the first draft Business Plans. We evaluated company performance and highlighted key issues for our future work. The results of this exercise are captured in each company section.

For the draft plans in July and October, and the final December Plan, we looked at three aspects when we examined company track records from RIIO-1, namely:

- Actual and expected output performance against targets set for the companies, and whether these targets had been met or exceeded
- Actual and expected RIIO-1 Totex, including the explanations given for differences against allowance, and how RIIO-1 Totex efficiencies would be transitioned and captured in RIIO-2. We were also looking for evidence that Totex projects had been deferred from RIIO-1 to RIIO-2 such that consumers would potentially be funding the same investment again.
- Actual and expected return on regulatory equity (RORE) and how this had been achieved; also the provision of information on payments made to shareholders.

These aspects from the December Plans are summarised in Table 3 and further detail is in the company sections.

Table 3: Summary of Outputs, Totex, RORE performance in RIIO-1 from RIIO-2 Business Plans

	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU
Outputs	Met all targets	Met all targets	Some targets missed	Some targets missed	Some targets missed	Met all targets	Some targets missed	Met all targets
Totex	20% under-spend	3% under-spend	4% under-spend	17% over-spend	7% under-spend	12% under-spend	15% under-spend	19% under-spend
RORE	10.5%	9.4%	9.1%	7.2%	9.2%	11%	11.1%	9.4%

The better performers, SPT, NGN, SGN and WWU performed strongly overall on output targets and provided a clear evidence path to explain their actual expenditure and returns in RIIO-1. On Totex, the companies identified the efficiency savings they expected to realise as the main driver of outperformance. They also demonstrated how they expected to transition these savings into RIIO-2.

Of the poorer performers, NGET provided very broad brush evidence about the difference in actual Totex from allowances and the efficiency gains that were realised. We are concerned that NGET's underspend during RIIO-1 may have resulted from higher than necessary allowances rather than efficiency gains, and we are unconvinced that these efficiencies are being carried through into RIIO-2. Despite NGET's expenditure deferral during RIIO-1, we are concerned that already funded asset health expenditure has been deferred into RIIO-2, and that NGET is accelerating asset expenditure in the last two years of RIIO-2 to potentially impact the Totex profile for RIIO-2.

As far as SHET is concerned, we note that improvements have been made in achieving performance targets, but have found the evidence provided about Totex expenditure to be generally of poor quality. While SHET has accelerated asset replacement expenditure prior to RIIO-2, we have concerns that this is not based on robust asset data. If such an expenditure increase is shown to be justified, we are also concerned that expenditure may have been deferred until RIIO-2.

NGGT has faced challenges during RIIO-1 due to rising cost pressures relating to asset health, IT/cyber and business support and has overspent its allowance. We have found the evidence to support this as being efficient to be relatively limited. Cadent has also provided limited evidence to support its expenditure plans in RIIO-1. In Repex, Cadent expects efficiencies of 18% with some of this realised by targeting lower cost (but higher risk) smaller diameter pipes. We are concerned that this means that more expensive Repex expenditure has been inefficiently deferred.

Overall, we think the better performers have been more transparent and have demonstrated better evidence to support their RIIO-1 delivery track record, giving greater confidence that they will pursue a similar approach in RIIO-2.

The above comments have primarily focused on Totex and performance issues, but we note the level of returns available in RIIO-1 are very high and support Ofgem in ensuring the available range of returns are reduced for RIIO-2 to the benefit of consumers.

2. Business Plan Commitment and Assurance

We evaluated Business Plan commitment and assurance using a combination of the following factors:

- the inclusion or otherwise of a clear statement from, or in the name of, the Board that it endorsed the Plan and considered it to have the key requirements set out by Ofgem of ambition, efficiency, accuracy and financeability;
- evidence of well-structured and robustly implemented governance arrangements surrounding data included in the Plan and of appropriate external assurance of that data;

- an unambiguous statement that remuneration, at least at a senior level, will be linked to Plan outputs.

The results of our scrutiny of the plans are summarised in Table 4 below.

Table 4: Business Plan Commitment and Assurance RAG rating

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Business plan commitment/assurance									n/a

The assurance statements were of surprisingly varied quality (and, for such an important statement, several were unhelpfully difficult to find in appendices). Several failed to make the clear statement about the ambition, efficiency and robustness of their Plans required by Ofgem. Most managed, a combination of statements which, when taken together, amounted to near endorsement but we could see no reason why any company should fail to provide, in a prominent positon, an unambiguous statement, signed by or explicitly on behalf of, the board covering the key qualities of ambition, efficiency, accuracy and financeability. We do not consider statements by an external consultant, even if helpfully clear, to be an appropriate substitute for an undertaking from the board.

Because none of the Companies accepts Ofgem's working assumptions (WAs) for cost of capital allowances, no board is able to give the unqualified statement about financeability required by Ofgem. We have dealt with the question of financeability in the relevant section. In this section, we assess not financeability itself but the quality of the board's statement on the subject. In that context, we prefer, and have rated accordingly, unambiguous statements that the board does not consider its Plan financeable on the basis of Ofgem's WAs (with a suitable explanation) to statements which are superficially positive but carefully qualified.

Most companies (though not all) have set out the governance process which they have applied to development of their plans in a good deal of detail. The best plans give a clear account of a risk-based approach to inform decisions as to the level of assurance which is appropriate for any given statement. The majority have gone on to describe a 'three (in one case four) lines of defence' process based principally on different levels of internal oversight and challenge. All of the plans are supported by at least some external assurance although the type and quantity varies widely, with some companies employing a large number of experts. We have thought it helpful when, as is the case in a number of instances, the summary reports from these assuring parties are included in an appendix.

No company provides a really satisfactory assurance statement about alignment of management remuneration arrangements and Plan outputs. A very small number mention the question in the assurance section of their plans and some others include statements of a generalised nature elsewhere, sometimes in an appendix not cross referenced to assurance. Where there is mention of alignment between remuneration and Plan outputs being either in place or, more often, proposed, detail is, in almost all cases, very limited.

3. Stakeholder engagement

When scrutinising the Business Plans, we looked at three aspects for our assessment of stakeholder engagement, which were as follows:

- how effectively the companies used enhanced engagement processes to develop their plans;
- how compelling their approach is to ongoing engagement in RIIO-2, including how well their future strategy matches up against the principles set out in Ofgem's Business Planning guidance; and
- any proposals the company makes for bespoke incentives in this area.

We also took account here of how complete plans were in their July and October draft form. Where there were significant gaps at these early stages, we regarded that as a lack of in-depth engagement with us as it made it difficult for us to scrutinise plans as fully as we wished**.**

Table 5: Stakeholder Engagement rating

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Stakeholder engagement									

Stakeholder engagement to develop the plan

The better plans set out clearly on a chapter-by-chapter basis in the main body of the plan: what stakeholder engagement they had used to inform their plans; how it had influenced their proposals; and what decisions they had made when views were in conflict or if they had not acted on feedback. Weaker plans gave a more general overview of feedback and how they had acted on it, and didn't articulate clearly how they had resolved trade-offs.

The acceptability scores for the plans ranged from about 80% to 90%. However, given the different ways that companies approached both the methodologies and the reporting of this research, we find it difficult to take a view on whether the relatively high, absolute level of these scores, or the differences between them are meaningful. We think there would be merit in the group of independent, ongoing CEGs and UGs undertaking some collaborative work on the best way for companies to approach willingness to pay research and acceptability testing so that more meaningful, comparative conclusions can be drawn in future. As well as finding a comparable approach, we would suggest that the groups also explore an issue that was highlighted by NGET's Plan. It says that, while 87% of 'household and business customers' agreed its plan was acceptable, household consumers clarified that this support was 'conditional on limited increases in other components of their overall energy bill', and that its proposals 'would not be acceptable if all parts of the energy bill were to increase by similar proportions'. We would suggest that Ofgem and the independent groups could usefully explore the extent to which acceptability testing with consumers in future could take account of the total impact of energy costs on consumers' bills.

Perhaps unsurprisingly, gas distribution companies were more experienced than transmission operators at how to engage effectively with end consumers. There is a considerable opportunity and need for the transmission operators to catch up in this area. The strongest plans used (and committed to the ongoing use of) a range of research methods with consumers. These include longer-form deliberative techniques which enable consumers to give a more informed response to what are

often unfamiliar and complex issues. In particular, we welcome the proposals from NGN and WWU to use citizens' juries.

We were concerned at the engagement timetable followed by some companies. It is hard to accept that plans have genuinely been built from the outside in when significant areas of engagement remain unfinished even in the October Plans. Only a few companies, for example, were able to give results of acceptability testing in their October plans. That said, we note that there was clear evidence in the final versions of some plans of responding to weak levels of support from stakeholders and company challenge groups, by removing or moderating proposals.

The impact of engagement on the plans was also unclear in several companies' early drafts, although this usually improved by the final plan. This may have been another consequence of engagement timetables, but we thought it could also be an indication that the approach to stakeholder engagement and, in particular, to making business decisions based on a rich understanding of stakeholder views and experiences, is not sufficiently embedded in several of these companies.

Our monitoring of Customer Engagement Group and User Group views throughout the process showed that all companies generally supported and engaged with their groups well. Some of the companies that ended up struggling with the timetable also struggled to provide timely and sufficient information to the groups in the latter stages of plan production. The better plans gave a full account in the main plan of how they had responded to the insight and challenge provided by their group and by us; weaker plans gave only a general overview of this.

Future stakeholder engagement strategies

In October, all companies' plans were unclear to some extent about the cost of their future stakeholder engagement strategies and how they would judge their value for money. Most companies added a more transparent statement of costs in their final plans, although it is still unclear in some cases what the total cost of engagement is. For example, some have clarified that the costs given are only for those activities that are new for RIIO-2, and so incremental to existing costs. Several companies also make clearer statements in December about how they will judge the impact and value for money of their engagement over time. The best say they will look to monitor and measure on an ongoing basis the impact and value of the changes they make in response to stakeholder engagement. To support this, several companies have or plan to develop social return on investment tools. This is an area that Ofgem could usefully explore at the Open Hearings, and where the company groups could collaborate to ensure that different approaches are rigorous, consistent and applied in a proportionate way.

All companies commit to the ongoing use of a Customer Engagement or User Group throughout RIIO-2 although it remains unclear in some cases how these groups will be used. The better plans set out more clearly how they anticipate deriving additional value from their challenge, but also allow space for these independent groups to define their own approach. Occasionally there is a suggestion that the emphasis of the groups should be on engagement activities. However, we believe that CEGs and UGs can - and clearly have – played a much broader role than this, scrutinising plans and challenging companies across the full range of their activities. We suggest that Ofgem makes its expectation of this broad remit clear in its final determination.

While all companies recognise the impact and potential of their company-specific independent challenge groups, a number make constructive suggestions for how a comparative overview could be retained on certain topics. For example, NGN proposes an annual CEG chairs' best practice summit, hosted in turn by each of the companies. The purpose would be to ensure that the CEG chairs have a network-wide overview in order to benchmark their own company's practice. Similarly, SGN suggests that the groups collectively fulfil an oversight role for an industry-wide measurement framework. And SPT's User Group suggests that there could be one User Group for all the transmission companies to enable performance comparisons across the group.

Our experience through this process is that the independent, in-depth challenge from these groups has demonstrably improved the final plans, significantly so in some cases. Based on this experience, we are optimistic about the potential for the ongoing groups to help hold the network companies to account for performance and delivery throughout the period of the next price control. We think there is greater merit in retaining company-specific groups, but would encourage Ofgem to consider the various suggestions for collaboration between the groups in order to enable them to maintain an effective overview of industry best practice from a consumer and customer point of view.

Bespoke incentives

Most of the companies propose bespoke reputational incentives to underpin their commitment to deliver their enhanced engagement strategies, and/or to report on the delivery of their commitments. These are all essential activities and there is no financial risk to consumers as they are reputational incentives. However, culturally we feel it would be preferable to see this type of activity now as business as usual, and so not need the special highlight of a reputational incentive. NGN, for example, promises the same commitments without the need to highlight them with a reputational incentive, and, in response to challenge from its CEG, WWU withdrew its original proposal for a financial incentive in this area.

Cadent and SPT propose bespoke financial incentives in specific areas of stakeholder engagement. We welcome the companies' focus on areas of particular importance (whole systems solutions, in the case of Cadent, and vulnerable communities, in the case of SPT) but we were unconvinced at this point that either merited additional financial reward.

Our overall assessment is that there is still a considerable way to go before stakeholder engagement is fully embedded in these companies. In too many cases, engagement still seemed to be sporadic and stop-start, rather than on-going and demonstrably driving decisions at every level, from the Board to the front line. It is essential that this transformation continues at pace – starting in advance of RIIO-2. Only by deeply embedding engagement will these companies be able to develop and deliver their activities in a way that genuinely meets the needs of customers, consumers and society – as well as their shareholders - and to understand (and evidence) where the acceptable trade-offs lie.

4. Outputs

This section provides our views on all the output measures proposed by the companies, covering customer service issues, resilience and vulnerability. The fourth

output category (deliver an environmentally sustainable network) is considered below in conjunction with wider transition and whole system issues.

The companies have provided output and incentive proposals in accordance with the Ofgem sector methodology. They have all provided a number of bespoke outputs in their plans, ranging from seven by WWU to 32 by SGN. There was a difference in approach to funding these outputs, with some companies including funding in their Totex baseline and others including some in their baseline with costs to be added if the outputs are adopted. Due to limitations on our time, we were unable to analyse these funding approaches in detail, but are concerned that some of the requests for additional output funding may duplicate costs that may be considered as Business as Usual (BAU) in company Totex plans, or once the costs are fully understood, the outputs may not represent value for money.

The ESO has described outputs in relation to its four key themes covering control centre operation, market development, network competition and a sustainable energy future. We have provided our views on these below.

Customer outputs

We scrutinised companies' plans for customer service initiatives and, in particular, the service levels they aspire to in RIIO-2. We also looked at plans related to their complaints performance. For GDNs, this area included company responses to the penalty incentive around the average time that it takes companies to restore supply after unplanned interruptions. For electricity transmission companies, we reviewed proposals around 'Energy not supplied'. For NGGT, we also looked at the plans to deliver network capability and input from stakeholders and consumers. For all companies, we looked at any bespoke outputs proposed.

Table 6 Customer Outputs RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Outputs: customers									n/a

<u>Customer outputs proposals</u>

In early drafts, many companies' proposals in these output areas (including their proposals for bespoke outputs) were lacking in a number of ways:

- many failed to provide any meaningful cost benefit analysis for their proposals.
- many did not discuss whether they had considered other options to achieve their desired outcome or why their proposals were the best options.
- in significant new areas (such as the need to provide automatic compensation payments to customers) companies often failed to demonstrate how they could be confident that these new requirements could be delivered.

Many of these weaknesses were addressed in the final plans for Ofgem, but the late appearance of more detailed proposals and justifications made it difficult for us to analyse these proposals as fully as we wished.

In relation to customer service, the ambition of most gas distribution companies is to maintain or modestly improve their current performance. We think that this is

acceptable given the current good performance by most companies, and the need for additional, targeted focus on other areas (customers in vulnerable situations, for example, and those living in multi-occupancy buildings).

As new survey methodologies are currently being established and targets in this area will be set by Ofgem next year for both gas distribution and electricity transmission companies, not all companies offer a stretch target. But we welcome the proactivity of those who do, including WWU and SPT.

Some of the transmission operators propose new digital or customer relationship management (CRM) system solutions to address service-related feedback from their connections customers. It was not always clear to us how these specific solutions address the broad range of service improvements that customers want to see, or how companies would ensure that these developments stayed on track to meet customers' needs during the scoping and delivery phases. This may be a useful area for ongoing scrutiny by the company User Groups.

On complaints, we would have liked to have seen more discussion and evidence of how root-cause analysis is being effectively used to reduce or eliminate complaints on the same issue. There also tended to be more emphasis on how fast complaints were resolved, rather than on whether complaints were resolved to the satisfaction of the complainant.

Among the gas distribution companies, we found the various proposals for time limits to restore supply in the case of unplanned interruptions difficult to judge. There is a wide range of performance in this area – particularly among those companies who serve consumers living in multi-occupancy buildings – and the picture was confused by companies' suggesting additional time limits to accommodate large events (which Ofgem will now capture with this incentive). Overall companies' proposals for performance targets in this area seem modest although potentially in line with Ofgem's definition of these as only minimum performance standards. We welcome, though, NGN's plan to extend further its shareholder-funded enhanced compensation arrangements in this area, and WWU's plan to introduce a similar approach.

The three electricity transmission operators propose targets for the Energy Not Supplied incentive ranging from 90MWh to 178MWh. These are based on their own historical performance, which (in practice) is probably the simplest way to account for differences in network characteristics. The proposals represent tightening compared with RIIO-1 of between 21% and 45%. But all should be viewed in the context that average annual performance during RIIO-1 has been within a range of 19MWh to 35MWh – in other words, significant outperformance even compared with the new targets. The companies use different approaches to justify their proposals, and point to the impact that a single event can have on performance. This makes it hard to evaluate the true degree of stretch in the targets, without carrying out a more detailed cross-company comparison. We suggest that Ofgem does this to ensure the targets are equally stretching and that, where possible, the same values are used for common parameters such as the Value of Lost Load.

A significant development in this price control is the increasingly widespread use of social return on investment tools. Companies have used these to prioritise their proposals and, in some cases, to quantify the value of their CVPs. SGN in particular proposes a bespoke financial incentive around 'social value collaboration' looking at

how to drive social benefit (or minimise social harm) by stimulating a step-change in company collaboration around works. We think this is an important area and suggest that this is a useful area for further scrutiny at the Open Hearings to ensure that tools and proposals are robust and proportionate.

Consumers in vulnerable situations

Gas network companies have specific vulnerability outputs, which Ofgem requires them to fulfil. We have assessed all these companies' proposals for how well they meet Ofgem's Business Planning requirements. We have also considered the companies' levels of ambition.

Table 7: Consumers in vulnerable situations RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Outputs: vulnerable consumers	n/a	n/a	n/a	n/a					n/a

In most areas, the Business Plans' proposals should improve support for consumers in vulnerable situations from the levels currently being delivered. There are some good proposals, which should improve outcomes for these consumers. Many of these are well evidenced by research and consumer engagement, which is used to demonstrate the potential impact of these proposals.

The gas distribution companies' levels of ambition range from incremental change to a radical shift in improvement. To some extent, this reflects their current performance, which is already good in some cases.

Most companies have articulated a good understanding of vulnerability and how to approach working with and supporting their customers. Proposals for 'use-it-or-lose-it' allowances are generally ambitious and well justified. There is more of a mixed approach to partnerships with organisations such as housing associations who could help to deliver better outcomes. Some networks demonstrate a good understanding of this type of partnership working.

Compared with GD1, there is a lower level of ambition for the Fuel Poor Network Extension Scheme across all network companies. Evidence provided by companies reflects the more stringent criteria for targeting households and also the low level of availability of whole-house treatments. We note that CEGs have been supportive on the whole of the evidence provided for the levels of ambition in these areas.

<u>Bespoke outputs</u>

Some companies have looked to go beyond the aims of the price control and have included ambitious bespoke output proposals in this area. In October, we thought that few met the high bar to justify a bespoke incentive as set out by Ofgem, especially as business-as-usual expectations have increased in this area for RIIO-2. In the Final December Plans to Ofgem, we have seen a great improvement in this area and where these bespoke outputs are well evidenced and justified we have welcomed them. We have assessed them using Ofgem's own criteria for bespoke incentives.

Resilience outputs

Our scrutiny of resilience outputs in the Business Plans covers three main areas as follows:

- asset resilience plans
- workforce plans and
- cyber resilience.

We have not undertaken a detailed review of cyber resilience plans due to their confidentiality.

Asset resilience: for our assessment of asset resilience, we expect each company to:

- set out their plans to maintain asset health.
- demonstrate evidence of asset criticality and associated replacement/refurbishment priorities both at the start of the price control and at the end of the price control, demonstrating their views on asset degradation with or without intervention.
- explain long-term risk strategy, as well as the long-term benefits delivered by proposed interventions. Monetised Risk objectives should be informed by stakeholder engagement and cost-benefit analysis (CBA), and demonstrate that selected investment options efficiently both meet their stakeholder-driven objectives and deliver sufficient net benefit for existing and future consumers.

Workforce resilience: we expect Business Plans to demonstrate how companies will develop a modern, diverse, high quality, well-trained workforce fit for the future. Plans should explain how the key workforce challenges for the business will be addressed, including factors such as age profiles, retention of key skills, staff training, competition for resources, etc.

Cyber resilience: while we have not assessed company cyber plans because of confidentiality requirements, we would expect plans to demonstrate that BAU IT expenditure is efficient and cyber costs are not duplicated.

Evaluation of December plan: our overall assessment for the December plan submission is set out in Table 8.

Table 8: Resilience Outputs RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Outputs: resilience									

Overall, we thought all companies provided reasonable workforce resilience plans. GDNs highlighted competitive pressure on resources. However, we are sceptical about this given that the anticipated future requirement for clean gas only in new homes is likely to free up resources. We felt some of the plans were quite high level, representing policy or strategy statements rather than an actionable delivery plan.

On cyber resilience, we did not have access to enough information to differentiate between the companies. However, we are concerned that the level of expenditure in

some companies is high and may be inefficient. We address this issue further in the cost section.

On asset resilience, again we felt most companies had provided a reasonable explanation of their track record, prioritisation and asset condition. However, we were concerned that NGET and SHET have not provided sufficient evidence to convince us that their knowledge of their asset health was robust and that their interventions were justified. We also had reservations about NGGT's asset data but note that they have taken active steps to address resilience issues and have overspent their allowance in RIIO-1. Further views on asset expenditure plans are provided in the cost and engineering justification sections.

ESO outputs

For the ESO outputs, we scrutinised their proposals for delivering benefits for consumers under each of their key themes, reviewing their proposed initiatives, their ambition and delivery plan together with performance measures. Our views on their key outputs are:

- Control centre operation – well developed plans were provided for enhancements to control centre infrastructure including the development of a 'digital twin' to enhance energy transition and whole system capabilities.
- Market developments – we welcome plans to develop a new single market platform for balancing and other services, but have some reservations about whether Ofgem and other participants have been sufficiently involved.
- Network competition – we feel that ESO could have been more proactive in seeking non-network whole system solutions. In particular, we have reservations about the effectiveness of the Network Option Assessment process.
- Sustainable energy future – similarly, we felt the ESO could be more proactive, and that some of the interdependencies with DNO's may not have been fully taken into account.

Overall, we think the ESO has developed reasonable outputs which we support but we feel there is scope for these to be developed further.

5. Environment /Net Zero/Whole Systems

Table 9: Net zero/Whole Systems RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Towards NetZero/Whole System									

Table 10: Environment RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Outputs: environment									

Governments' ambitions for net zero (2050 for UK, 2045 for Scotland) are a major new challenge for the sector which has only fully emerged during the Business Planning process. In considering the July and October draft plans we allowed for the need to catch up with this later timetable. For the December plans we expected to see fully articulated responses to this challenge

Net zero will need to be a very significant consideration in the RIIO-2 determinations. Major decisions will need to be taken within the RIIO-2 period. The companies, Ofgem and government all have significant roles to play if net zero is to be achieved, as indeed do consumers. Each party will need to step up to the challenge, rather than waiting for others to take the lead, or focusing narrowly on those areas which purely meet their own interests.

All companies have developed their proposals across the three draft plans and relative to RIIO-1 most companies have upped their game. Some husbandry proposals around tier 1 to 3 carbon reductions, waste and supply chain management for example are admirable. But no company has hit anything like a gold standard. It is clear that there is more work to do in order to build up whole system and cross-vector thinking, rather than each company simply pursuing its own interests, Important areas such as the implications for workforce or the scope for competition in delivering new investments are notably under-developed. The plans do not present a complete and coherent strategy, either individually or in sum, although the best contain important elements of such a strategy. It is clear that Ofgem will have to fill a large space in order to ensure that RIIO-2 outcomes are consistent with the progress needed to achieve net zero.

The pathways to net zero cut across a number of separate areas of the draft Business Plans: outputs, including EAPs, but also Capex and Repex, whole systems thinking, innovation and CVPs. We have sought to draw the threads together here and for each company. We have not taken a view on where the costs of meeting these challenges should fall between consumers and taxpayers as this issue is being addressed by government.

The better plans take the EAP guidance as a starting point for wider analysis - in many cases using the UN SDG framework - and include realistic but stretching proposals which go some way beyond BAU. Some, such as SPT and Cadent, discuss the big issues in net zero in an intelligent and informed way, and consider a range of scenarios - drawing on objective sources of evidence, not simply industry perspectives.

Over the RIIO-2 period there is an urgent requirement to ensure electricity networks are able to operate with carbon free power and meet the needs of electric vehicle charging; and for larger scale pilots of low carbon heat using both heat pumps and hydrogen with CCUS. Some companies, for example Cadent, NGET and SPT, put forward substantive new proposals. This does not imply that their proposed solutions are necessarily the best but they show serious engagement with the issues.

The better plans also include non-asset related issues, such as billing methodologies, as well as the implications for assets. They show serious engagement with stakeholders outside their part of the sector and indeed outside the sector altogether, show a real understanding of the challenge of moving to a genuine whole systems approach and have started to map out possible delivery pathways.

Poorer plans lack ambition, analysis and detail. They focus on scenarios that maximise the role of their company, rather than on alternatives and are not fully informed by outside expert analysis. They rest too much on past activities, rather than developing next steps and rely predominantly on compliance with the guidance, and on marginal extensions to BAU such as methane emissions reductions from the iron mains replacement programme. They make more modest proposals around the companies' direct environmental impact. They are internal rather than externally facing and do not fully engage with third parties.

There is no agreed view of precisely where whole system leadership should sit: in particular, the ESO's view of the demarcations does not fully tally with that of the transmission companies. Indeed, the appropriate location may depend on the kind of systems interactions required. The ESO may be best placed to take a view across major assets but it is probably not best placed to look at regional or local systems.

We think the ESO plan has shown good ambition in its vision and plan for a carbon free power system by 2025. The ESO plan describes the alternative scenarios and looks at the implications for the wider energy system. While a reasonable pathway is presented we feel that the ESO could have been more proactive in describing its future role in the energy transition.

Environmental husbandry also emerges from the engagement exercises as a key concern for consumers as well as a direct means for companies to contribute to achieving net zero and wider environmental improvements. We have specifically examined how far companies have:

- Properly analysed their baseline environmental impacts
- Established science-based targets for greenhouse gas reduction
- Included plans/ambition for own business greenhouse gas reduction summarised in their proposed trajectories for scope 1 / 2 and scope 3 reductions
- Tackled short to medium term sector-specific issues and technologies eg SF6 in electricity; and biomethane and methane leakage/shrinkage in gas
- Developed wider environment plans: e.g. for office waste, plastics (including PE pipe), water, virgin aggregates use and spoil reuse, biodiversity, amenity and air quality.

In our assessment we have found that care is needed to avoid giving excessive credit for what is in effect compliance with current or likely future regulatory requirements. Examples include air quality (eg compressor replacement) and the new English (at least) approach in the planning system and draft Environment Bill towards requiring biodiversity net gain for all projects. That said, where companies are seeking not only to comply but also to move beyond – eg into natural capital or to quantify positive net gain - we feel this is laudable.

6. Digitalisation plans

Our scrutiny of company digitalisation plans considers whether the plans:

- deliver efficiency improvements for each company, and

- aid other markets and the wider economy/consumers, including participants that might be currently unrelated to energy network investment and operation.

We expect these plans to include:

- an honest assessment of their current status.
- a digitalisation strategy addressing digital and data best practices, showing where they want to get to.
- a digital architecture design and associated delivery plans.
- How the plans are being coordinated between network companies, enabling access and interaction with customers and other organisations, and engaging with wider digital initiatives.

Table 11 shows the results of our scrutiny of the plans in this area.

Table 11: Digitalisation plan RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Digitalisation plan									

We found that the better performers, NGET and NGN had provided a clearly defined plan with the aims and scope for digitalisation plans within their business, including the costs and benefits associated with these initiatives, and a delivery plan. They were already well advanced in terms of implementation and enabling wider access to data. Cadent was a weaker performer and, while a plan had been developed, Cadent appeared to be at a much earlier stage of development with resources only now being put in place. The ESO has a well-developed IT strategy and plan and was the most advanced in some areas especially for ambition. Their amber rating indicates our concerns about whether they could deliver this ambition.

We also found weaknesses with many of the other companies. Generally, there was a tendency to be internally focused, not considering the wider and external opportunities where these plans could add value. Also, companies demonstrated varying levels of ambition, capability and delivery confidence.

While the work that has been done to date is welcome, we think that this whole area of the plans is underdeveloped and fear this may result in important consumer benefits being lost and risks inefficient expenditure until company capabilities become more developed. In particular, we wish to see the recommendations of the Energy Data Task Force for data accessibility and transparency implemented and some companies were lacking in this respect.

7. Managing Uncertainty

Ofgem prescribed certain expected uncertainty mechanisms in its sector methodology and we while we have considered company responses to these, we have particularly focused on the bespoke UMs that companies have proposed. We have also considered the company proposals for RPE indexation. The ESO was not required to propose uncertainty mechanisms. We have evaluated UMs against whether we think they should be risks that the company is best placed to manage and whether each proposal offers value for money for consumers ie:

- Balance of company or consumer risks: each company is required to set out each risk and uncertainty mechanism with its materiality, frequency, trigger events, and probability and to explain where the risks lie. In our evaluation we are looking for the evidence justifying the proposed balance of risk between company and consumer. We are seeking to ensure that the companies are managing the risks that they are best placed to manage and risk is only passed to consumers when it becomes an unmanageable risk for the company. We also think there should be a materiality factor so that there is a focus on the most material risks being addressed through uncertainty mechanisms.
- Value for money: for each risk, the company is required to describe and quantify the proposed uncertainty mechanism, setting out benefits and drawbacks (and their materiality). We have considered whether we think the uncertainty mechanism offers value for money. In this regard we have also considered the proposed volume drivers and the risk of them being set inaccurately.

Our assessment of the company uncertainty mechanisms from their December plans is set out in Table 12.

Table 12: Managing Uncertainty RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Managing uncertainty									n/a

The better performers e.g. NGGT and NGN have limited the number of uncertainty mechanisms they have proposed, giving us more confidence that they are not unduly passing risks to consumers that they are best placed to manage. We still, however, think that these uncertainty mechanisms need review as the balance still seems to favour the companies.

The weaker performers, e.g. NGET, SHET, and WWU, have included a number of uncertainty mechanisms where we think risks should sit with the company and not with consumers. We think the design of their mechanisms have been balanced more in the company's favour than consumers. We are also concerned about the potential for poor design of volume drivers proposed by NGET and SHET to address uncertainty in generator connections and associated reinforcements.

Overall, based on the limited time we have had to review these, we think that NGGT and NGN have provided better defined and more limited uncertainty mechanisms, and we have increasing degrees of concern about the other companies. However, we expect Ofgem to validate and assess all these proposals, taking account of potential bias to the company's benefit. Where a company's proposals are taken forward, we expect the benefits to the company of risk mitigation to feed into an overall calibration of risk/reward within the price control settlement.

8. Efficiency – innovation and competition

In this area we are considering three main elements in our evaluation, namely innovation plans, competition and Totex efficiency targets.

- Innovation: we are looking to see how previously proven innovation is rolled out into BAU and how the benefits are included in plans for RIIO-2. We are

also looking at company plans for finding new innovations and how this will be funded, either in baseline Totex or Network Innovation Allowance (NIA) funding.

- Competition: we are looking for Business Plans to describe all projects for late competition over £100m, for early competition over £50m, and provide a native competition plan.
- Efficiency: we are looking for plans to propose the Totex productivity gains they are targeting for RIIO-2 over and above any other efficiency or innovation savings carried forward from RIIO-1.
- ESO - we have also set out of our view on the contribution of the ESO plan towards whole system efficiency.

Our overall evaluation results from the December Plan are set out in Table 13 below.

Table 13: Efficiency – innovation and competition RAG rating

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Efficiency									

Innovation - all companies provided detailed innovation strategies and plans, demonstrating how they were collaborating with third parties. NGN and SPT demonstrated how their prior efficiencies were being deployed in RIIO-2, whereas the evidence provided by lower scoring companies was weaker. Most innovation funding is being sought from NIA or other external sources. While a number of companies indicate they will provide their own Totex funding for some elements of innovation, we are sceptical that this represents anything more than business as usual efficiency initiatives. We are concerned that SGN appears to suggest their own innovation funding commitments are contingent on getting an adequate return on equity.

Competition – very few projects were identified as being suitable for competition (other than transmission projects already identified by the ESO NOA process, SPT synchronous compensation projects, and the Cadent Hynet project) which was a disappointing result. Some companies identified potential projects but then determined that they were not suitable for competition. All companies provided reasonable native competition plans. We think all companies could have been more proactive in identifying projects for competition even if they did not meet Ofgem's qualifying criteria. We think that there may be further scope for competition in new connections for both gas and electricity companies.

Efficiency – company proposed efficiency improvements ranged from 0.3% pa to 1.1% pa. Overall, we think that none of the companies have been particularly ambitious in this area given the very significant efficiency savings many have realised during RIIO-1.

ESO - the ESO has a key role to play in optimising the efficiency of the whole electricity system, engaging with other industry participants, including Transmission and Distribution companies, to optimise network solutions and with energy market participants for energy and other non-network solutions. The ESO is able to identify initiatives that may significantly impact other company plans.

We do not think there is evidence of sufficient co-ordination between the ESO and the TOs in their plan development and the assessment of alternative investment options. The Network Options Assessment (NOA) process does not seem to consider the full potential for non-transmission network solutions or co-ordinate the assumptions made by companies to feed into the requirements of the price control process. Furthermore, it is unclear how this coordination will be addressed during the price control to ensure that the optimal investments are being made, or other solutions sought. While we understand that the ESO's role in this area is not clearly defined, we think the ESO could have been more proactive in TO plan development to ensure that options were being considered and the optimal long-term solution found.

9. Costs

In order to evaluate company expenditure forecasts we have examined each company's prior track record and looked at the evidence provided to justify where forecasts of investment drivers are higher than historical trends. We expect forecasts to be based on assumptions no greater than the lowest point of the ranges in the ENA Common Scenario report. We are looking for companies to:

- justify costs, including cost drivers, consideration of options, and cost profiling.
- describe how efficiency and innovation will be used to reduce costs.
- describe how their expenditure forecasts map onto relevant ODIs and PCDs.

We are also looking for evidence that each company has incorporated wider drivers which may reduce required network expenditure, e.g. from consumer behaviour change or from smarter network applications.

We have compared the upward and downward cost and volume drivers and efficiency improvements across the companies. For asset expenditure we have considered each company's justifications against the following criteria:

- Is it needed? The need case for the volumes of intervention, taking account of evidence such as actual asset condition, or customer requirements. While Network Asset Risk Methodology (NARMS) and monetised risk justifications are expected, we are also looking for corroboration from actual asset condition assessments.
- What intervention? The type of intervention showing that options have been considered e.g. replace, refurbish and there is an appropriate balance between risk and value for money i.e. has lower cost refurbishment been fully considered?
- Is it efficient? Are unit costs efficient? Have efficiencies and innovation benefits been built in? Are risk margins being added to project costs?
- Was it previously claimed under RIIO-1? – Is this an activity that appears to have been deferred from RIIO-1 and that customers have already paid for?

<u>Our engagement with the companies</u>

Totex allowances form a critical part of the price control allowance and the incentive regime. The supporting evidence presents a vast array of detail for us to consider. In

engaging with the companies on this over the last year we have sought to prioritise our work by gaining an understanding of the key upwards and downwards cost drivers that may be expected for RIIO-2, to compare the differing evidence and initiatives that companies have proposed such that we may provide an effective challenge.

In spring 2019, prior to the submission of first draft plans, we asked the companies a wide range of common questions related to Totex past performance, extending before RIIO-1 so that we could get a view on performance profiles over time. We also asked for early views on key changes expected for RIIO-2 so that we could prepare for plan submissions.

After the July plan drafts were submitted we fed back overall to the companies that we thought that Totex forecasts were higher than necessary and for most companies the evidence provided to support cost submissions was limited. To assist our evaluation of company costs, we also invited companies to provide downward sensitivities for elements of their Totex forecasts in their October plan. Because most companies forecast an increase in non-load related or Repex expenditure, we asked for sensitivities that would show the impact of maintaining their own run-rates of expenditure that they had applied for the first six years of RIIO-1. We asked for:

- A forecast for non-load related expenditure (NLRE Capex or Repex) and Opex expenditure which was no greater than the annual average of RIIO-1 actual to end March 2019 (years 1-6 of the 8 year RIIO-T1 control period).
- The above with an additional efficiency reduction of 2% per annum in NLRE and Opex.

The responses to our sensitivity request were quite limited, with most companies arguing that safety, reliability and other mandatory investment requirements would prevent them from considering any reductions from their forecasts. SHET did not respond.

In the October plan submissions there was a significant reduction in the Cadent Totex bid, but limited change in other plans. We provided feedback to the companies on their October plans highlighting that we still felt there was scope for improvement in terms of evidence provided and also for additional efficiencies to be provided. In October we also sent the companies questions on a small number of deep dive areas for each of them, and carried out a questioning session to gain a deeper understanding of the company capabilities and plans in these areas.

The December plans generally included a greater depth of evidence but there was little change in the Totex bids. In particular, the December submissions allowed us for the first time to understand the way in which companies had apportioned costs and risks between output measures, Totex and uncertainty mechanisms.

We are concerned that some companies have proposed uncertainty mechanisms such that their baseline Totex costs can be reduced, or have used output measures to justify why costs should be included in Totex. Companies have taken different approaches which we have sought to identify in each respective area. We would welcome further analysis by Ofgem teams regarding the alternative approaches that companies may have taken.

Review of December plans

Our overall December plan rating for each of the companies is set out in Table 14 and the reasons for our assessment are included in this section.

Table 14: Costs RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Costs									

The overall change in Totex compared to RIIO-1 is set out in Table 15 for each company, highlighting that SPT shows a decrease, while all other companies show an increase. NGGT is seeking a 54% Totex increase. The main upward cost drivers are related to asset health, mandatory expenditure and IT expenditure. SHET is seeking more than double the RIIO-1 expenditure for asset health and NGET and NGGT are seeking around a 40% increase. GDNs' increases are driven by increased costs for mandatory Repex.

Table 15 also shows the levels of expenditure proposed by the companies for IT, telecoms and cyber, totalling some £3 billion or 12% of Totex overall. There is significant variation across companies. We note that total IT/cyber related expenditure across National Grid Group companies (NGET, NGGT and ESO) will be around £2 billion over RIIO-2, the majority of this expenditure.

Table 15: Changes in categories of expenditure from RIIO-1[8]

	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
% Totex change from RIIO-1	10%	-6%	16%	54%	1%	3.5%	9.5%	5%	n/a
NLRE Capex or GDN Repex (% change from RIIO-1)	42%	15%	256%	39%	11%	11%	5%	10%	n/a
IT/cyber expenditure (% of Totex)[9]	£573m (8%)	£56m (4%)	£92m (4%)	£597m (23%)	£388m (7%)	£103m (8%)	£255m (8%)	£76m (6%)	£815m (63%)

We are concerned by the overall level of expenditure on IT, cyber and associated costs by a relatively mature industry. The level of expenditure and means of delivery needs further examination by the Ofgem teams. While elements of this expenditure are driven by the need to ensure the networks are robust against cyber-attack, which we support, the generally high levels of expenditure proposed individually by each company raise questions whether this is being efficiently designed, procured and implemented. Other delivery models may be more efficient.

Electricity transmission

We have then compared the different companies in more detail. The transmission companies are set out in Table 16, showing that load related expenditure is expected to reduce for all companies, although changes to this expenditure may be dealt with

[8] All numbers taken from BPDTs. SGN totex numbers have been adjusted to include like for like Xoserve costs. Treatment of other GDN Xoserve costs should be examined by Ofgem to ensure comparability.

[9] IT/cyber expenditure taken from BPDTs or company plans. NGET number does not include £241m of op.telcoms expenditure. SPT's number includes £19m of telecoms resilience.

by uncertainty mechanisms. The main increases are in non-load related Capex and non-operational Capex (which is largely accounted for by IT costs).

The RAG colours in the table show the range of highest percentage increases (red) between RIIO-1 and RIIO-2 to the highest percentage decreases (green).

Table 16: Electricity Transmission companies' costs[10]

	NGET		SPT		SHET	
Expenditure Category	**RIIO-2 Average Totex**	**RIIO-1 to RIIO-2 Change**	**RIIO-2 Average Totex**	**RIIO-1 to RIIO-2 Change**	**RIIO-2 Average Totex**	**RIIO-1 to RIIO-2 Change**
	(£m)	**(%)**	**(£m)**	**(%)**	**(£m)**	**(%)**
Local Enabling (Entry)	36	-49%	15	-72%	71	-21%
Local Enabling (Exit)	15	-46%	10	170%		
Wider Works	138	-47%	55	-20%	93	-50%
LRE - sole-use Local Enabling (Exit - Sole Use)	9	-11%	10	116%		
LRE - sole-use Local Enabling (Entry - Sole Use)	5	105%	5	-14%	3	276%
TSS Infrastructure	13					
Total Load Related Costs	216	-41%	95	-31%	168	-42%
Replacement	397	20%	77	16%	155	245%
Refurb	113	346%	13	57%	0.1	-16%
Non-Load Other	11	-8%	1	0%	12	0%
Total Non-Load Related Costs	521	42%	90	15%	173	256%
Non-Operational Capex	75	88%	3	27%	22	642%
Total Network Operating Costs	235	26%	22	53%	42	123%
Closely Associated Indirects (CAI)	210	5%	34	-17%	51	36%
Business Support	92	-4%	21	13%	21	55%
Other Costs Within Price Control	69	100%	3		4	-3%
Total Totex	**1421**	**10%**	**275**	**-6%**	**480**	**16%**

We have examined a number of these cost areas, particularly non load related expenditure and Opex and further detail is provided in the relevant company annex. In summary our views are that:

NGET: We found NGET's plan made it difficult to reconcile planned expenditure against their track record. For example, we note that NGET's BPDT data suggests they are planning to move to a greater amount of refurbishment than replacement but there is little evidence to support this.

As for all ET companies, we examined NGET's NLRE by asset category which showed significant cost and volume increases in the areas of protection and control and most other categories. We also noted that unit costs increased significantly in most areas. We think these costs and volumes are considerably higher than necessary and ask Ofgem to examine these in more detail. We have also examined the need case justifications for some of these assets and think they have been poorly justified.

We also have concerns that load related and other expenditure, particularly IT costs, are higher than necessary. We think that a considerable amount of expenditure may have been delayed from RIIO-1.

SPT: We found SPT's plan to be very accessible. Overall, we find expenditure in the SPT plan to be well justified but we are concerned that the NLRE has increased

[10] All numbers are taken from Company BPDT's. We note that SHET's NLRE expenditure individual line items do not summate to the total presented in the tables and ask Ofgem to investigate further.

significantly. The scope and timing of load related and boundary reinforcement expenditure may be uncertain and may need to be included in uncertainty mechanisms. Corporate and business support costs are forecast to increase by 13% and justification for this increase is weak.

SHET: Overall, we have concerns across Capex and Opex expenditure that these forecasts are not built on evidenced costs and volumes. Our analysis of asset categories shows large cost and volume increases.

Because of the sharp increase and nature of the justifications, we are concerned that SHET forecast costs for RIIO-2 may be higher than necessary. While we recognise that SHET has recently increased expenditure above its RIIO-1 allowance to address asset health requirements, they have provided limited evidence to justify an estimated doubling of asset health and Opex expenditure above current levels.

Gas transmission

Table 17 sets out the key cost changes for NGGT for RIIO-2. The RAG colours in the table show the range of highest percentage increases (red) between RIIO-1 and RIIO-2 to the highest percentage decreases (green).

The largest upward drivers are for non-load related Capex (asset health and decommissioning) and other indirect Capex (largely IT and security costs). Indirect and non-operational is also mainly cyber/security costs.

Following their over-spend in RIIO-1, NGGT have proposed a significant increase in asset health expenditure for RIIO-2, which we have reviewed. We have not been able to examine IT and related costs because of the large confidential element.

Table 17: NGGT key cost changes in RIIO-2[11]

NGGT Expenditure Category (£m)	Average RIIO-1	Average RIIO-2	Total RIIO-2	% Change
Load related Total	6	2	12	-59%
Compressor Emissions	34	31	157	-7%
Asset Health	87	122	610	41%
Decomissioning	2	17	83	769%
Other Non Load	1	- 0	- 0	-106%
Customer Contributions	- 1	-	-	-100%
Non-Load Related Capex Total	122	170	849	39%
Operational Costs	38	38	192	0%
Other Indirect/Non-Operational Capex	18	121	607	566%
Closely Associated Indirects	32	31	156	-1%
Business Support	34	33	163	-3%
Other Indirect and Non-Operational	-	24	119	>100%
SO Costs	88	101	505	14%
TO TOTEX (excl. UM)	250	420	2,098	68%
SO TOTEX (excl. UM)	88	101	505	14%
TOTAL TOTEX (excl. UM)	**338**	**520**	**2,602**	**54%**
TO TOTEX (inc. UM)	302	548	2,742	81%
SO TOTEX (inc. UM)	97	102	510	5%
TOTAL TOTEX (inc. UM)	**399**	**650**	**3,252**	**63%**

We have concerns that these costs, volumes and timings of expenditure are not justified and that these forecasts are higher than necessary. In particular, the proposals to enhance cyber security do not appear to have fully considered alternative options such as limiting the connectivity of control systems. On asset health, we recognise the need for ongoing expenditure but we are not convinced that maintaining existing RIIO-1 levels of expenditure will result in unacceptable reliability or breach mandatory requirements.

Furthermore, as network capacity utilisation decreases towards 2030, the opportunities for NGGT to defer and reduce expenditure appear not to have been fully considered. We think more could be done to exploit the reducing gas demand to optimise costs.

Gas distribution

Table 18 sets out a comparison of the gas distribution companies from their BPDT submissions, identifying that the major cost increases are in Repex, largely relating to mandatory replacement, although there are also significant increases in non-mandatory Repex. The RAG colours in the table show the range of highest percentage increases (red) between RIIO-1 and RIIO-2 to the highest percentage decreases (green).

We have sought to ensure that all GDNs are compared on a like for like basis. We think that the total Totex should be adjusted from that shown in the table to reflect

[11] All numbers taken from company BPDT

corrections for Xoserve in SGN's submission, and for enhanced outputs in Cadent's submission.

According to Ofgem's most recent cost benchmarking report, NGN is the most efficient company across total Totex, closely followed by WWU. SGN lies third and Cadent is fourth. We have not had access to Ofgem's benchmarking analysis and suggest that this is made available so that a clear comparison can be presented.

Table 18: Gas Distribution companies' costs[12]

	Cadent		NGN		SGN		WWU	
Expenditure (£m)	**RIIO-2 Average**	**% Change**	**RIIO-2 Average**	**% Change**	**RIIO-2 Average**	**% Change**	**RIIO-2 Average**	**% Change**
Direct Opex								
Work Management	88	-19%	17	-1%	43	-6%	22	0%
Emergency	50	-8%	10	-5%	27	14%	13	32%
Repair	59	-16%	15	-7%	25	-13%	11	15%
Maintenance	100	32%	17	46%	36	23%	17	-1%
Statutory independent undertakings					7	-31%		
Other Direct Activities	16	-41%	4	-44%	6	-52%	3	-65%
TOTAL DIRECT OPEX	313	-7%	63	1%	144	-4%	66	-3%
Indirect Opex								
Business Support	93	-17%	23	-4%	51	31%	27	27%
Training & Apprentices	17	11%	4	44%	11	20%	4	26%
TOTAL INDIRECT OPEX	109	-13%	26	1%	61	29%	31	27%
Capex								
LTS, storage and entry	35	17%	17	12%	52	44%	15	61%
Connections	22	-36%	8	-14%	20	-1%	12	1%
Reinforcement (<7barg)	10	-20%	6	48%	13	43%	5	2%
Governors	3	-52%	2	-29%	11	26%	3	35%
Other Capex	79	23%	19	-21%	34	1%	10	-45%
Transport & Plant	13	16%	4	27%	12	60%	7	0%
TOTAL CAPEX	162	2%	55	-4%	143	23%	51	-3%
Repex								
Tier-1	338	5%	63	-9%	201	9%	62	5%
Tier-2A	3	-41%	1	-73%	3	-35%	0	-86%
Tier-2B	3	-79%	8	16%	7	-50%	9	94%
Tier-3	23	78%	7	134%	4	-52%	1	0%
Other Policy & Condition (inc. MDPI)	45	140%	18	297%	13	87%	5	6%
Multiple Occupancy Buildings (MOBs)	24	24%	1	0%	17	19%	2	-13%
Non Mains Replacement Services	44	8%	8	-6%	18	-5%	9	11%
TOTAL REPEX	478	11%	106	11%	263	5%	88	10%
TOTEX	**1,063**	**1%**	**250**	**4%**	**612**	**8%**	**236**	**5%**

Notes:
SGN totex shows 9.5% increase once Xoserve costs are treated like for like. £54m p.a. of enhanced output costs included Cadent, NGN and WWU - output costs are included in baseline totex

As far as particular companies are concerned, we would make the following comments:

Cadent: overall, Cadent's plan submission was clear and well evidenced. Despite the efficiency improvements Cadent have made, we are concerned that it remains the least efficient of the GDNs. We are concerned that tier 1 Repex seems to be increasing, which may include deferred expenditure from RIIO-1. Maintenance costs are also increasing.

[12] All numbers taken from company BPDTs.

NGN: a clear, well-evidenced plan was provided. Based on Ofgem's last published benchmarking report, NGN appears to still be ahead of other GDNs in terms of efficiency but we think the plan does not capture all potential efficiencies.

SGN: a clear, well evidenced plan was provided. The cost increases seem to be due to the inclusion of enhanced output costs which we think should have been included in baseline expenditure.

WWU: a well evidenced plan was provided. As for NGN we think there are further efficiency savings that may be delivered.

We would also make a number of general points:

- Mains replacement – mandatory and non-mandatory. Cadent has provided the chart 1 showing a decline in mains incidents since 2010. Given the declining risk compared to the vast expenditure planned for mains replacement, we would suggest that an urgent review takes place to consider if the mandatory replacement programme should continue at current levels.

Chart 1: Incidents (explosions) caused by the Main and Services through time (all GDNs)[13]

Figure 2: Incidents (explosions) Caused by Mains and Services Through Time (All GDNs)

- The SGN NIC Project "Real Time Networks" has indicated a significant potential fall in peak gas demand and recent Government policy has said there will be clean gas only in new houses from 2025 (2024 in Scotland). This should allow the lowering of grid pressures which reduces leakage and repairs, and allow increased replacement by insertion. The NTS offtake capacity required should be also less and PRS uprating projects are not likely

[13] Chart provided by Cadent in December business plan

to be required. Customers should receive the benefits realised from lower gas demand.

- Non-mandatory replacement – we note that a significant level of investment is planning in non-mandatory Repex, often with long payback periods. We think consideration should be given to restricting replacement to projects that have a less than 10 year payback period.
- The GDNs operate gas pressure reduction sites which require heating. The gas consumed on such sites is generally not metered or subject to any incentive. We think GDNs should be encouraged to address this to reduce costs and emissions.

ESO Costs

The proposed costs for the ESO are shown in Table 19, showing about a £80m pa increase from RIIO-1 for the first two years of RIIO-2, and while the ESO plan will only be agreed for two years, current forecasts show this level of expenditure continuing for the remainder of RIIO-2. The RAG colours in the table show the range of highest percentage increases (red) between RIIO-1 and RIIO-2 to the highest percentage decreases (green).

The increase is mainly due to increased IT costs for initiatives to support the aim of carbon free power system operation by 2025, and enabling the energy transition and whole system benefits. We are concerned that around 75% of ESO services and costs, and especially IT costs are provided by National Grid Group, placing them in a dominant position.

Table 19: ESO cost comparison between RIIO-1 and RIIO-2[14]

Funding Category	RIIO-1 Average (8 yrs)	RIIO-2 Average (2 yrs)	% Change
Operational Support	6.3	6.7	8%
Operations	19.2	24.1	25%
Total Short Term Costs (role 1)	25.5	30.8	21%
Charging	4.1	3.6	-13%
Codes	6.1	10.6	75%
EMR	2.1	3.3	60%
Total Market Development and Procurement Costs (role 2)	12.2	17.5	43%
Medium Term Network	6.4	8.6	33%
Strategy	2.1	2.4	13%
Scenarios	1.2	1.3	4%
Long Term Network	6.2	6.8	10%
Total Long Term Costs (role 3/4)	16.0	19.1	19%
Supporting Operational Costs	6.7	7.7	15%
Total Operational Costs	60.5	75.2	24%
Business Support	52.7	80.4	52%
ESO Capex	47.7	84.5	77%
Total System Operating Costs	160.9	240.1	49%
Other Costs Within Price Control	15.0	19.8	32%
Total Costs Within Price Control	175.9	259.9	48%

[14] All numbers taken from ESO BPDT's

The expenditure programme proposed by ESO contains a large number of IT projects – an area with high risk. Many of these projects are currently only at design stage. It is therefore particularly important that the capital programme delivery is subject to clear governance and checks and balances particularly given it is a cost pass through regime. The 2-year Business Plan reviews should also provide oversight over programme delivery.

Overall, we are concerned that the ESO does not fully appreciate the challenge of running this size of IT programme and this number of projects, alongside their system operation role, and with the high level of dependency on National Grid Group. Significant weakness and lack of clarity remain about the precise governance of projects and their dependencies.

Overall Cost summary

Our key overall concerns about Totex are:

- Repex and non-load related expenditure is increasing significantly from RIIO-1. Totex adjusted for load related expenditure is shown in Table 20.
  The table shows that total Totex with load related expenditure stripped out is increasing by 23% between TIIO-1 average and RIIO-2 forecasts. This is a total of £4.1 billion across all companies for the RIIO-2 period, with the greatest increases being shown by the electricity and gas transmission companies and the ESO. While some increase may be justified for the ESO and for cyber security, we think this increase of expenditure is not what we would expect for these mature businesses, where assets and activities are relatively unchanged between price control periods, and with downward cost drivers from efficiency and reducing demand. The companies with the largest changes are transmission companies NGET, SHET, and NGGT and these are the ones where we have least confidence about their cost forecasts.

  The RAG colours in the table show the range of highest percentage increases (red) between RIIO-1 and RIIO-2 to the highest percentage decreases (green).

Table 20: Comparison of total Totex less load related expenditure between

	RIIO-1 Average Totex less LR	RIIO-2 Average Totex less LR	RIIO-1 to RIIO-2 Change	RIIO-1 to RIIO-2 Change
	(£m)	(£m)	%	(£m)
NGET	924	1205	30%	1404
SPT	155	180	16%	125
SHET	125	313	149%	937
NGGT	333	518	56%	927
Cadent	979	996	2%	88
NGN	213	220	3%	31
SGN	498	532	7%	169
WWU	199	205	3%	29
ESO	176	260	48%	420
Total	3603	4429	23%	4131

RIIO-1 and RIIO-2[15]

- **IT costs**: these are increasing significantly and total some £3 billion across the sector and the justifications for increases are not transparent due to cyber confidentiality concerns. Most of the increase is attributable to National Grid Group, especially the ESO and NGGT.
- **Uncertainty, outputs and costs:** we note that companies have taken different approaches in apportioning costs and risks between output measures, Totex and uncertainty mechanisms. We are concerned that some companies have proposed additional uncertainty mechanisms such that their baseline Totex costs and risks can be reduced, or have used output measures to justify why baseline Totex should be higher. When considering these related areas, we think better overall performers should have included output costs in their baseline Totex as well as excluding uncertainty mechanisms that unduly bias risk to consumers.

We would welcome further analysis by Ofgem in considering the alternative approaches that companies have taken in these areas.

10. Engineering Justifications and Cost Benefit Analysis

Alongside our cost assessments, we have examined the engineering justifications and cost benefit assessments that have been provided by companies to justify their expenditure plans. We are looking for each company to provide robust CBAs and engineering justifications for each of the key expenditure areas. In particular, we are seeking:

[15] The numbers in the tables are taken from company BPDTs. Non load related totex for transmission companies is calculated as total totex less load related Capex expenditure. For GDN's it is calculated as total totex less <7 bar reinforcement, connections and LTS, storage and entry

- Engineering justifications that are based on specific projects and use evidence of historic actual asset condition to corroborate asset health models.
- CBAs that are clearly set out with their key assumptions and with sensitivities to changes e.g. future energy scenarios. They should be transparent about which risks, costs and benefits have been included or excluded in the analysis and calculations. They should show that all options have been considered (including non-network or deferment) options against a baseline minimum level of intervention needed to remain compliant with all applicable regulations.

Following the company submissions for the July plan, we fed back to most companies our concerns that their engineering justifications and CBAs were either missing or inadequate to justify expenditures. We also asked for companies to demonstrate that they had taken actual asset condition data into account to corroborate their plans. In October, significantly more information was supplied but some companies e.g. SHET did not provide this information until December, which made it difficult to assess in the time available.

Our results of the scrutiny of the December plans is set out in Table 21.

Table 21: CBA and Engineering Justifications

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
CBA and Engineering Justifications									

The better scorers were SPT, Cadent and SGN, all of whom provided significant details and justifications for individual projects. In being specific about many of their projects, and looking at alternative options, these companies gave us more confidence that much of the expenditure was justified. However, even with these companies we have some reservations that not all options were considered and that unit costs were higher than necessary. We noted that Cadent had enhanced its evidence significantly for its December submission and that SGN provided CBA/EJs for all schemes over £500k, however much of their CBA evidence seemed quite generic. NGN and WWU also submitted a reasonable set of CBAs and EJs, albeit scoring slightly lower on the evidence provided.

SHET and NGGT both significantly enhanced their submissions in December. SHET's plan in October was significantly incomplete, and there were no EJPs submitted. The final plan now has 51 Engineering Justification Papers covering all of the key proposed investments. In the limited time available to us, we believe that they provide most of the information required to assess the Plan.

For NGGT, we have reviewed a significant number of their EJ/CBAs and reasonable evidence is provided. However, we are unconvinced that this expenditure could not be phased over a longer period without adverse impacts. We have concerns about some EJ/CBAs e.g. cathodic protection, where we consider that actual asset condition has not been reflected in the assessment. We would wish to see greater evidence from decommissioned assets to substantiate these justifications, together with careful consideration of how assets such as compressors may be managed at least cost as they approach their decommissioning.

NGET was the lowest scorer in this evaluation. CBAs and EJPs in the final plan were in many cases generic, with some seeking to justify large sums of expenditure for major work programmes in one lump, rather than being at a project-level and site specific. We found the EJPs more useful than the CBAs, which conveyed little additional information, and were limited in detail. Option evaluations were on the whole presented as generic assessments. We would like to have seen specific EJPs, asset condition reports, and CBAs for what are individually significant expenditure proposals, and recommend that Ofgem reviews these when they are made available. Overall, the final EJPs were disappointing and without asset specific justifications, we found it difficult to gain confidence over the cost certainty in the NGET proposals.

Overall, there was a significant increase in information available in December. As well as the comments made above, we have some wider concerns about the way the EJ/CBAs and how they influence the expenditure plans. We think the following factors should be considered in Ofgem's plan evaluations:

- NARMs: While we value the NARM monetised risk metric is a key determinant of the benefits calculation in the CBAs, we are concerned that any shortcomings or data immaturity in this metric could both prejudice upfront decision-making, and reduce certainty in the measurement of actual risk reduction benefits delivered to customers. We note that there appears to have been significant volatility in the monetised risk calculations between different versions of the plan. We would like to see NARM's evidence corroborated by other data such as details of actual asset condition.

- CBAs: We noted that there appeared to be inconsistencies in CBAs and they did not always explicitly take into account parameters that we would have expected to feature, such as carbon benefits from reduced electrical losses with replacement transformers. If such factors prove to be material we would like to see those taken into account in decision-making.

- Gas demand assumptions: With gas demand expected to fall over the RIIO-2 period we are concerned that some planned expenditure e.g. GDN non-mandatory Repex, has very long payback periods. We would like to see CBAs take account of declining gas demand to reduce the risk of long payback potentially stranded assets. Similarly, for NGGT, investment in compressors may not be required if NTS capacity utilisation is falling. We don't think this has been fully considered in option modelling.

- Unit costs: While some companies have sought independent benchmarking of unit costs used in CBAs and investment plans, we are concerned that most are internally generated and therefore may be overstated. While the value of independent reports is welcome, they also need to be assessed by Ofgem to make sure that they are robust. We are also aware that some companies have included a risk margin in their expenditure plans which may distort the cost assumptions.

- Intervention option: While CBAs present a selection of options for intervention e.g. do nothing, replace, refurbish, we find that a number of these appear quite generic and that the option to simply defer expenditure is not necessarily explored.

- Transport: We have observed that a number of companies have plans to renew their transport fleets, some potentially replacing ahead of need and sometimes with low carbon vehicles. We question whether this expenditure is efficient given that low-carbon vehicles are likely to become competitive with ICE technologies (or even cheaper) during the course of RIIO-2.
- New asset replacement: We understand that some companies e.g. NGET may be proposing to replace relatively new equipment as part of their asset replacement campaigns. We are keen to ensure that this is minimised so that consumers do not bear this additional cost.
- Deferment/Totex underspend: Most companies have underspent Totex in RIIO-1. We are concerned that this may have led to a reduction in maintenance and/or a deterioration in asset health such that additional costs are incurred in RIIO-2. Whilst it is difficult to establish this we would expect Ofgem to review previous maintenance activity on a randomly selected basis for some companies to assess if assets have been adequately maintained.

Given the limited time we have had to examine these justifications: we will rely on the further examination by the Ofgem teams. We would suggest that Ofgem assesses evidence that engineering justifications are based on specific projects and use evidence of historic actual asset condition to corroborate asset health models and historic maintenance has been appropriate.

We have also reviewed the ESO CBAs, which were developed to demonstrate the benefits of their IT investments. We note that additional investment of £400m in additional IT expenditure appears to deliver £2 billion of benefits. We found the ESO CBAs to be reasonable, albeit based on high level assumptions.

11. Finance

This sections starts by explaining the results of our scrutiny of all network company plans, except for ESO, which is at the end of this section as different considerations apply to it.

Table 22 provides the results of our scrutiny of December Business Plans in the areas of Finance.

Table 22: Finance RAG ratings

December evaluation ratings	NGET	SPT	SHET	NGGT	Cadent	NGN	SGN	WWU	ESO
Finance									

All network companies (except ESO)

Our scrutiny of the network company plans covered all the main issues relating to financeability and their implications for consumers. It had three principal areas of focus:

- did the Company present a full justification of the financial rating which it was targeting, particularly if that rating was higher than BBB?
- is the Company financeable on the basis of Ofgem's Cost of Capital WAs and, where necessary, has it considered all relevant actions to achieve financeability, particularly in the context of anticipated asset lives and the

implication for depreciation and capitalisation rates? Did the Company demonstrate that it had engaged meaningfully with us and with appropriately qualified consumers, particularly in relation to the trade-offs between equity returns and costs to consumers and the allocation of risks between the Company and consumers?

Against those requirements, we consider a 'good' Plan financing section to have the following characteristics:

- confirmation that the Plan is financeable on the basis of Ofgem's proposed Cost of Capital allowances on both a notional and an actual basis both with and without provision for the outperformance assumption;
- evidence of engagement with stakeholders (and, in particular, appropriately qualified consumers) in relation to key assumptions such as the target rating chosen and the proposed range of mitigating actions to improve financeability;
- evidence that any mitigations proposed are at low cost to the consumer;
- presentation of any alternative proposal appropriately separated in an annex (avoiding use of the main body of the plan as a platform for extensive lobbying in relation to Cost of Capital allowances).

Despite our request for final drafts, the financeability sections of the July draft Business Plans were generally of a much lower quality than we had hoped for. There was a low level of compliance with Ofgem's Cost of Capital WAs, and all companies said their plans were unfinanceable on the basis of those WAs. There appeared to be little attempt to achieve financeability at low cost to the consumer (for example through changes to depreciation and capitalisation rates) and there was, by contrast, a strong focus on arguments to support an increase in both the Cost of Equity and Cost of Debt allowances (particularly the former) with obvious implications for the cost to consumers. Non-compliance with Ofgem's requirements for information in relation to financeability (such as sensitivity analysis) was widespread and we saw no meaningful engagement, whether direct with consumers or through targeted consumer representative groups, on key financial assumptions. Most plans appeared to place a greater degree of emphasis on making a case for higher Cost of Capital allowances than on value for money for consumers.

The October Plans showed clear evidence of companies having taken note both of our oral commentary at the end of July meetings and of our August feedback letters. Most (though not all) of the October drafts were considerably improved in terms of compliance with Ofgem's minimum Business Plan requirements though a few were, disappointingly, still not compliant with even a narrow interpretation of those requirements. Overall there was still little focus on achieving financeability at low cost to the consumer and an emphasis on higher cost options, particularly an increase in Cost of Capital (especially Equity) allowances. There remained a lack of evidence of meaningful consumer/stakeholder engagement on key financing assumptions.

We commented to companies about compliance with Ofgem's WAs in relation to their July and October plans but have not, in the time available, been able to make a full assessment of that compliance in relation to the December plans (which will obviously be checked by Ofgem).

The determination of the appropriate Cost of Capital allowances is a matter for Ofgem at the time of the Final Determination but we have thought it appropriate to take note of, and comment on, the alternative proposals presented by companies, all of which are based on Cost of Capital allowances which, to a greater or lesser extent, differ from Ofgem's. All companies have presented such a proposal and, in line with Ofgem's Business Plan Guidance, we have not viewed the mere inclusion of an alternative proposal as unhelpful. We have, however taken a negative view when:

- the Plan is insufficiently distinguished from the plans based on Ofgem's WAs and/or the emphasis in the main body of the Plan is distorted by its use as a platform for extensive lobbying for a higher Cost of Capital (mainly Equity) allowance;
- the proposed Cost of Capital allowances are unnecessarily high to achieve debt financeability and are used to support a level of return on equity which we regard as unwarranted;
- we consider there is no requirement for an alternative proposal as the Company's Plan appears to be readily financeable with Ofgem's Cost of Capital WAs and/or
- there is no evidence that options other than increased Cost of Capital allowances, have been rigorously investigated.

Overall, there is little evidence of ambition in achieving financeability on the basis of Ofgem's 4.8% Cost of Capital WA and even less at the 4.3% level. All Plans focus principally on an increase in the Cost of Equity allowance as a means of achieving financeability and, despite requests from ourselves, there is little real evidence of companies seeking to deploy lower cost measures to aid financeability where Plans suggest they are needed. In their final plans, most companies explore the sensitivity analysis which they had performed in some detail but fail to use that information to support an appropriately nuanced and considered approach to financeability. In general, we consider there needs to be a culture, which places much greater emphasis on the consumer.

There is wide variation in the interpretation of 'financeability' with at least one company seeking to make the case that ensuring financeability is principally an Ofgem responsibility. Despite a clear indication from us that we consider that the targeting of any rating higher than BBB requires detailed justification and support from stakeholders, all companies have targeted a rating higher than that for the Notional Company and with very little evidence of engagement with stakeholders (other than shareholders and debt related stakeholders). Most provided quite detailed justification for their chosen target rating but none submitted a balanced quantitative analysis of the merits of targeting a BBB rating. In our view, most companies failed to take properly into consideration qualitative issues which might impact the rating agencies' views, such as a target ratio being narrowly missed in one or two years. Some companies have done this well and we consider those that have not done so to have fallen below the minimum standard required for this type of analysis.

There is a general failure to recognise the wider context in which the ratings should be considered: how far they are maintained in downside sensitivities and the extent

to which minor amendments to input data would improve ratios. Attempts to justify the target rating selected almost all fail to link that justification to an assessment of the underlying risk profile of the business and a discussion of the appropriate allocation of risk between the Company and its customers. Companies show little recognition of the fact that regulatory norms (in terms of target ratios but also more widely in relation to financeability) evolve over time to reflect both market conditions and generally more robust regulatory settlements.

'Financeability' is largely interpreted – correctly in our view - as a need to satisfy debt rating agencies' (and lenders') requirements. However, as drafts have been refined, we have noticed an increasing emphasis on 'equity financeability' i.e. stipulations in relation to returns required by shareholders. The universally proposed solution to both problems is an increase in the Cost of Equity allowance with some companies setting out a requirement for a Cost of Equity allowance very substantially in excess of 4.3/4.8% despite it being clear from their own analysis that their Plans can achieve target ratings for both their Notional and Actual companies with a Cost of Equity allowance at that level.

All the companies but one either accept or seek relatively less substantial changes to Ofgem's Cost of Debt allowance such as an alteration to the trombone period. Some of these apparently minor proposed changes have a not insignificant financial impact and there is also a need to be alert both to the level of debt issuance costs proposed in alternative cases, some of which we regard as excessive, and to the fact that, because of the debt/equity split, relatively minor increases in the Cost of Debt allowance have a disproportionate impact on the overall Cost of Capital.

There is a general rejection, largely on grounds on inter-generational fairness and rating agency acceptability, of increased capitalisation rates and the shortening of depreciation periods as an aid to financeability. We accept that these are tools which should be used with discretion but there are instances in which a minor adjustment to capitalisation rates would result in the achievement of a target rating. Although most companies have considered, and rejected, a shortening of the depreciation period, they have done so only as a potential aid to financeability, with little focus on the wider context of asset lives and the potential for asset stranding. The latter is obviously relevant principally to the gas sector and, perhaps not surprisingly, the GDNs all promote the view that the future for the gas network is such that any financing proposal based on a shortening of asset lives would be inappropriate at this stage. A number of the final plans evidenced engagement with our August and October commentary on this subject and produced a more extended analysis in the final plans as a basis for rejecting changes to capitalisation and depreciation rates. However, it is our view that, if companies wish to reject these two potential aids to financeability, a detailed justification of that rejection is required along with evidence of consumer and stakeholder engagement on the subject and that a failure to fully explore adjustments of this type is indicative of insufficient emphasis on consumer value.

Almost all companies failed to provide an analysis of the impact on customer bills of higher levels of gearing or of related consumer engagement and we remain to be convinced that 60% gearing is optimal for consumers. Similarly, there is little evidence to support the universal rejection of the 0.5% outperformance assumption (though this is clearly linked to the overall argument that the proposed Cost of Equity allowance is too low). We consider it important to note that, whether or not the 4.3%

rate is calculated on the basis of the concept of the outperformance allowance, a number of plans demonstrate financeability at this level even without significant mitigating measures (at least for the Notional Company). This is clearly to the benefit of consumers and, whatever the arguments advanced, particularly in relation to the concept of outperformance, we believe it is important not to lose sight of the underlying financeability of many of the Plans on the basis of a 4.3% Cost of Equity allowance.

Despite a generally satisfactory level of engagement with ourselves and some evidence of reasonably detailed work with stakeholders, where financeability is concerned all companies were very weak in relation to engagement directly with consumers (or with appropriately selected groups representing consumers). We accept that this is not always easy in relation to financing but we do not believe it to be impossible, in particular with regard to issues of intergenerational equity and the relationship between target gearing levels and risk. Overall there is little indication that, in structuring their financing proposals, companies have had the optimum outcome for consumers as the primary consideration. In this context we note the lack of CVPs for finance-related costs despite the fact that such costs constitute a very substantial proportion of consumer bills. There is in general little evidence that companies have considered financing in the context of the need to minimise those costs.

Table 23 sets out, for comparative purposes, the key metrics relating to the final Plans of all the companies' other than the ESO, which we have taken into consideration in assessing their overall rating for financing. The table needs to be understood in the context of the detailed Company by Company reports: it picks up all major issues, but a table of this kind cannot reflect qualitative issues, some of which we have deemed important. A similar table (Table 24) in relation to the ESO, needs to be understood in the same light.

	Cadent	NGN	NGET	NGGT	SHET	SPT	SGN	WWU
1.Financeability at 4.8%[1] **If yes, at what rating** **Notional - at 4.8% CofE** **Actual - at 4.8% CofE**	Yes (both) BBB+ BBB+	Yes (both) BBB+ BBB	Not without mitigating actions (Notional) Yes (Actual) n/a BBB+	Not without mitigating actions (Notional) Unclear (Actual) n/a (likely) BBB+	Not without mitigating actions (Notional) Unclear (Actual): n/a (likely) BBB+	Yes (both) BBB+ A-	Yes (both) BBB+ BBB	Yes (Notional) No (Actual) BBB+ n/a
2. Mitigation (if required) at 4.8% CoE (Notional) at low cost to consumer? [2]	Not needed	Not needed	Yes but at a much higher cost than needed	Yes but at a much higher cost than needed	Not at lowest cost	Not needed	Not needed	Not needed
3. What rating is targeted (Notional)?	BBB+	BBB+	BBB+	BBB+	BBB+	A-/BBB+	BBB+	BBB+
4.Financeable at 4.3%?[3] **Notional** **Actual**	Yes at BBB Yes at BBB+	Yes at BBB Yes at BBB	Yes at BBB Yes at BBB+	Yes at BBB Yes at BBB+	Yes at BBB Yes at BBB+	Yes at BBB+ Not provided	Yes at BBB Yes at BBB	Yes at BBB unclear

5. Alternative proposals to Ofgem CoE 4.8% and CoD 1.9%[4]	5.6% CofE 60% gearing 14-18 year trombone (about 2.4%)	5.0%CofE 60% gearing 14-18 year trombone (about 2.4%)	6.5%CofE 60% gearing 15 year trailing average (about 2.3%) + issuance cost (total c. 2.9%)	6.5%CofE 60% gearing 15 year trailing average (about 2.3%) + issuance cost (total c. 2.9%)	6.5% CofE 60% gearing CoD same as Ofgem WAs	6.5% CofE 60% gearing CoD same as Ofgem WAs	6.9% CofE, 65% gearing 15-20 year trombone (about 2.5%)	6.1% CofE 60% gearing 5.25% CofD

Table 23: summary of financing proposals across companies

[1]The rating marked reflects the stated view of the company. In many cases, we take a more positive view of financeability of the Notional Company, as detailed in the individual company reports.

[2] Where mitigation measures are needed, how far have options to achieve financeability at lowest cost (including changes to depreciation and capitalisation rates) been explored? Where the company states (or its plan strongly implies) that it was financeable at its target rating, we have assumed that no mitigation actions are needed.

[3] Where companies were not explicit in the 4.3% scenario, we have in some cases interpreted commentary.

[4] A number of companies have requested additional allowances for debt financing costs, which are not always clearly identified. The cost of debt noted here may therefore be understated. (Note: A 1.0% higher Cost of Debt allowance is broadly equivalent to an increase of 1.5% in the Cost of Equity allowance.

ESO

Most of the comments above apply also to the ESO but there are some important points, which apply only to the ESO which are noted below.

In general, the differences stem from the fact that the regulatory regime relating to the financing of the ESO is less mature than that of the other companies under review and that there are issues outstanding with Ofgem as to the most appropriate structure for debt financing the ESO plan, particularly in relation to the required working capital facility. We accept that this gives rise to some uncertainty as to the ratings which the agencies will eventually apply.

However, the ratios shown in the ESO's plan indicate that, as currently structured, it can achieve an A+ rating for both the Notional and the Actual Company on the basis of Ofgem's Cost of Capital WAs. It made a case, which we did not find very convincing, for additional annual payments (however structured) of between £13 million and £35 million to ensure its financial viability, despite a proposed Cost of Equity allowance which is over 50% higher than that for the other companies. We do not think that even the residual uncertainty resulting from the outstanding issues in relation to the scope of the ESO's responsibilities (particular the collection of TNUos, which will affect its risk profile and the ratings it is likely to be accorded by the rating agencies) warrants the very negative view which it appears to take of its financial viability. We consider very careful consideration would need to be given to any 'additional annual payment' (or change to the Cost of Capital allowance).

Table 24: ESO Financeability

ESO	
1. Financeability at 7.81% [1] **If yes, at what rating (Notional/Actual)?** **Notional** **Actual**	Yes, both A+ A+
2. Mitigation (if required) at 7.81% CoE (Notional) at low cost to consumer?[2]	Not needed
3. What rating is targeted (Notional Company)?	**BBB+**
4. Alternative proposals **Key metrics of proposed alternative Cost of Capital business case**	Ofgem WAs (7.81% CofE, 55% gearing and 25bps) plus additional annual 'payment' of £13 – 38 million

12. Consumer Value Proposition (CVP)

CVP was introduced into the RIIO-2 methodology as a way of recognising and rewarding the quality of Business Plans by quantifying the additional value which a Business Plan provides to consumers (whether current or future or specifically consumers in vulnerable circumstances) beyond minimum requirements and delivery of the normal business of an energy network company. The concept was a late addition to the RIIO-2 methodology and the Business Plan guidance in this area evolved between June and end October. Most companies therefore first included a draft of their CVP proposal in their October plan but several of these were at an early stage of development and had not been subject to full stakeholder engagement or challenge from their CEG/User group. In several cases they were very extensive, covering many aspects of the company's business and seeking to quantify the consumer value flowing from delivery of the core company plan rather than detailing the outcomes the plan would deliver in terms of additional value, going beyond BAU.

In our feedback to all the companies in October, we stressed that the standards and requirements for BAU are high and that we would expect CVP proposals to demonstrate that company plans were going beyond what customers and consumers could reasonably expect of a network operator (such as maintaining network assets to provide a safe and resilient network, providing timely connections, engaging in customer-funded innovation or investing in the network to increase capacity and address constraints - all of which featured in one or more of the draft CVPs). We also emphasised that we expected to see evidence that CVP proposals were supported by stakeholders and evidence of value for money.

In assessing the December proposals we have sought to identify CVP proposals which in our view genuinely provide something additional for consumers and specifically go beyond what should in our view be regarded as BAU for network companies or which offer an output which stands out as best in class. We have then looked for evidence that these had the support of stakeholders (including the CEG or User Group) and that they appeared to deliver value for money, especially where they involved extra funding. On the basis of the limited time and information available to us we have not felt able to comment on the appropriateness of proposed methodologies for quantification of CVP proposals and would recommend that Ofgem has regard to the scrutiny which the CEGs and User Groups were able to do in this area.

We have not found the concept of CVP easy to apply and we feel that the approach to identifying consumer value and specifically quantification might usefully be explored at Open Hearings. We have not found that any of the CVP propositions, viewed as a whole, presented a clear case of substantial additional value delivered to consumers although we consider that a few elements in some plans may deliver such additional benefit. We are aware that we have not had the opportunity to scrutinise and challenge individual elements of the CVP offerings in as much detail as the User Groups and CEGs, so we have focused on applying a few common principles and looking across all the plans to identify where there are elements of proposed output or value which offer something which we consider to be adding real value.

In our approach to evaluating CVPs we have applied the following principles:

- Aspects of plans which are already adequately incentivised and recognised in the regime (for example rolling out RIIO-1 innovation to deliver efficiencies or investing in innovation in RIIO-2; delivering capital investment; or delivering whole system benefits such as lower constraint costs through network upgrades) do not seem to us to offer additional value to consumers which should be recognised under CVP.
- Cost efficiency will be incentivised under the Totex incentive regime and should not also be rewarded on an anticipatory basis through CVP.
- Improvements in levels of service, including for customers in vulnerable circumstances, achieved during RIIO-1 should be regarded as BAU for RIIO-2; similarly we do not think there should be extra recognition for doing things which are now generally regarded as best practice in the utility sector (such as stakeholder engagement and cooperation across utilities under the PSR scheme).
- There is an expectation that companies across the economy will be seeking to reduce their carbon footprint and seeking to manage and reduce their environmental impact more generally so activities in this area do not automatically qualify as delivering additional value although we have recognised potential value in some specific proposed outputs in this area.
- Things which all socially responsible companies do (and which have reputational benefits and benefits for their workforce) such as promoting volunteering do not seem to us to be delivering additional consumer value and should be regarded as BAU (we note that some of the User Groups and CEGs took the same view).

We identified a particular challenge in relation to initiatives which were put forward in some plans as wholly shareholder funded benefits. These included compensation above prescribed levels and some community funds which were specifically described as shareholder funded. We recognise that these initiatives are intended to deliver benefits which stakeholder's value and we want to encourage network companies to reflect their commitment to social responsibility. However, it seems to us that if these individual initiatives are rewarded financially through a CVP they effectively cease to be wholly shareholder funded. This undermines to some extent their case for inclusion and in some instances the basis on which stakeholder support was established. This issue, too, would warrant consideration in Open Hearings given its general application.

- Although we have attempted to look at some of the individual proposals put forward, which seems to be the intention behind the Ofgem guidance, we feel that in some areas (for example provision for consumers in vulnerable circumstances, service standards and environmental initiatives) there is merit in looking at the complete offering of each company. We suggest that Ofgem should benchmark these between networks (and in some cases also against other utility companies) and seek to take a view of the additional value being delivered by the total offering in these areas. This reduces the risk that a single best in class measure within an offering which, as a whole, is not particularly strong might qualify for a reward, when there will in reality be more

value for consumers from a plan which is strong across the board in a particular area, such as support for vulnerable consumers, but which does not have a single output which stands out.

The proposals we have identified as potentially delivering extra value fall broadly into the following categories:

- Environmental and sustainability commitments which go beyond the minimum requirements in the Business Plan Guidance (particularly some proposals relating to biodiversity and natural capital)
- Enhancements to customer service
- Some proposals to support consumers in vulnerable circumstances
- Some proposals to drive whole system and low carbon transition

4. Areas for further analysis and Open Hearings

Ofgem's Enhanced Stakeholder Engagement framework for RIIO-2 has introduced Open Hearings as an additional element - to strengthen the voice of consumers in the price control process and to assist Ofgem's review of companies' RIIO-2 Business Plan proposals in an open and transparent way, supported by stakeholders.

Ofgem has indicated that, in selecting topics for Open Hearings, it will take account of particular areas of contention that have arisen from our analysis of the plans and from the CEG (distribution sector) or UG (transmission sector) process. Our terms of reference require us to identify (with reasons) the list of questions or concerns which we believe should be interrogated further in Open Hearings. In this section of the report we have set out a summary of the key areas which we consider Ofgem should explore further, possibly in Open Hearings. In Annex 2 we have set out a more detailed list of issues (some cross-cutting or sector specific and some by company) which we believe require further analysis and which may be suitable for interrogation in the Open Hearings with the companies. The topics suggested are informed by our analysis set out in the thematic overviews and individual company chapters of this report and the list of topics should therefore be read alongside the detail provided in each company report.

Cross-cutting issues for further consideration and/or Open Hearings Cost

The justification for proposed increases in Totex (over 20% like-for-like across all companies after adjustment for load-related expenditure), especially in the context of RIIO-1 underspends. What would happen if non-load related expenditure remained the same?

Mandatory Iron Mains Replacement Programme

We have suggested Ofgem considers an urgent review of this programme with the HSE, taking account of recent failure rate evidence. Such a review should consider factors including the implications for the network of heat decarbonisation, projections for gas demand and consumer support for methane leakage reduction.

Path to Net Zero

What are the key things needed in the RIIO-2 period to ensure the UK is on track for net zero across the range of possible scenarios, and what are the companies proposing to do to achieve this in the RIIO-2 period? In particular, what do they see themselves having the leading responsibility for?

The implications of short- to medium-term energy sector transformation are not currently or adequately addressed in plans. Issues to be explored further include: anticipated change to clean gas only in new houses after 2025; implications of significant reduction in gas demand; smart networks and the implications of distributed energy.

Financeability

There is a need to explore the lack of ambition and failure to focus on consumer value, which are features of all the financing proposals. All companies, (except the ESO which proposes an alternative mechanism to achieve higher revenues), propose a higher Cost of Equity allowance than Ofgem's WA and most propose a

higher Cost of Debt allowance; all companies target ratings at least two notches higher than necessary to retain an investment grade rating; all companies reject the concept of the 0.5% outperformance wedge and none properly explores measures to improve financeability such as changes to gearing and to depreciation and capitalisation rates. These issues are addressed in the chapters in relation to each company in the context of its individual financing proposal.

Outputs and CVP

Open Hearings will be an opportunity to further scrutinise whether the outputs proposed by companies are ambitious, represent value for money and align with customer needs. This public challenge will be enhanced by challenge from customers and stakeholders with expertise in the environment, supporting consumers in vulnerable circumstances and in customer service.

Role of the ESO

What role should the ESO be taking in the future whole energy system: the ESO itself, network companies and stakeholders should be encouraged to give views on possible ESO roles including delivery body, system architect, leader of industry reform and change, market or platform operator.

5. Company Report – Cadent

5.1. Summary

The following table sets out our rating for the Cadent final December Plan, together with the average ratings we have given them during their plan preparation stages.

Table 1: Cadent Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms		
Outputs: vulnerable consumers			Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October Plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to red where we thought it was weaker or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December plan ratings – our RAG ratings on their final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is weaker and the company proposals are not acceptable. Our explanatory comments are provided in this report.

5.2. Plan Highlights

- **Costs** - Cadent expects to underspend its Totex by 7% in RIIO-1. Cadent's Totex is forecast to increase by 1% (including customer outputs) between RIIO-1 and RIIO-2. Cadent is forecasting an annual 0.94% efficiency increase. Cadent is proposing a range of bespoke uncertainty mechanisms in addition to the common sector mechanisms.
- **Outputs** – Most customer service and reliability targets are expected to be met for RIIO-1. Cadent is proposing 30 bespoke output incentives for RIIO-2, with some being included in baseline funding.
- **Financing** – Cadent states that its Notional Company is financeable at a rating of BBB+ on the basis of Ofgem's Cost of Capital WAs without the need for mitigating actions.

5.3. Track record

Ofgem's Business Plan Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs – Cadent's customer service and reliability performance has failed to meet some of the output targets set for them during RIIO-1.

RIIO-1 Totex – The plan explains the transition from RIIO-1 to RIIO-2. Cadent expect Totex outperformance to be £650m or 7% below allowance of some £9 billion. In Repex, Cadent expects Repex efficiencies of 18% with some of this realised by targeting lower cost (but higher risk) smaller diameter pipes. Cadent claim they will increase their Capex spend over the remainder of RIIO-1 and this will be overspent by 4%.

RIIO-1 Returns – Cadent has set out the RORE earned over the RIIO-1 period, the key drivers behind these returns and the level of payment distributed to investors over the period. A RORE of 9.16% is forecast for RIIO-1.

5.4. Business Plan commitment and assurance

Cadent's Plan contains a Board Assurance Statement from the chairman on behalf of the board, including, explicitly, the SIDs. There is a focus on the integrity of the data and the steps taken by the board to ensure a robust and ambitious plan and the process for assuring this, including a 'three lines of defence' model to verify accuracy and efficiency. There is a statement that 'specialists have been engaged to provide assurance in relation to financeability and that the board is satisfied the company's Plan meets Ofgem's minimum requirements and further statements in relation to its efficiency, robustness and ambition.

The rigorous risk-based approach to assurance which the company has taken has been fully set out and the three lines of defence include external parties in the second, as well as the third, stage ((1) management, project team and advisors (2) the company assisted by PwC and (3) internal audit and independent subject matter experts). A robust and well-developed framework for governance is set out in the Plan and, in considerable detail, in the accompanying appendix. External assurance has been provided by a number of parties including, in addition to PwC, NERA, ICS, Costain, Lloyd's Register and KPMG. The final letters from these assurers have been helpfully included in the Appendix.

There is a statement in the Executive Summary that executive and staff rewards will be linked directly to the output commitments in the Plan. The detail of arrangements to link 35% of employees' annual bonuses to stakeholder engagement and delivery of customer outcomes (as against a 10% weighting for managers only in the past) and for a new LTIP 40% weighted towards the Customer Business Plan are provided in an Appendix which could usefully have been cross-referenced from the Assurance Statement.

5.5. Stakeholder Engagement

Cadent made significant changes to its Plan during the period that it was being developed. These changes have produced a more strategic and ambitious Plan. But they also meant that important elements were missing in earlier drafts, or that

significant changes were made from one draft to the next. The results of acceptability testing, for example, were included for the first time only in the final draft of the Plan. This meant that it was difficult for the CG to scrutinise the Plan in the round as fully as intended during the draft stages of July and October 2019.

In terms of acceptability testing, Cadent used a wider and more sophisticated range of methods to test the acceptability of its Plan compared with other companies. It says that 'over 83% of domestic and business customers' found the Plan acceptable. This appears to be at the lower end of the range of the companies in this price control. However, as there is little consistency in the way that companies report acceptability testing, and we are not able to judge whether methods are comparable, we cannot take a view on whether this is meaningful.

Cadent undertook a considerable amount of engagement to develop the Plan. In the earlier drafts, the direct impact of this engagement on the Plan was not set out clearly. However, this improved significantly in the final draft. The final version of the Plan also articulated Cadent's future engagement strategy more clearly.

This future strategy also builds on a number of encouraging initiatives to embed a more customer-centred culture. These include: a Chief Operating Officer-led Customer Outcome Performance Committee; the requirement for Board papers to show how research, engagement and benchmarking have been factored into recommendations; and the appointment of a Director of Customer Strategy. The plans for ongoing groups to engage specifically with customers in different regions, and with customers living in multi-occupancy buildings are also positive initiatives.

Cadent's final Plan gives the 'ongoing direct cost of engagement' as £2m and says that these costs are in the baseline. However, it also clarifies that these are incremental costs over RIIO-1 costs which they now regard as a 'core part of their performance management and governance regime'.

Two bespoke output incentives are proposed in this area. The first is a reputational incentive for an annual report to 'demonstrate continual improvement' in Cadent's stakeholder engagement approach and delivery of its commitments. This is an important initiative – although we note that other companies promise similar initiatives without feeling the need to shine a light on them via a reputational incentive. The second bespoke incentive is an evolution of the current stakeholder engagement incentive focused in particular on 'whole system solution initiatives and those related to energy transition' with performance assessed by an independent panel. Cadent presents this as a 'proposed common' financial incentive. This is clearly a worthwhile activity but we suggest that Ofgem explores during the Open Hearings whether this merits an additional reward given how central to stakeholder engagement these issues should be during RIIO-2.

5.6. Outputs

Cadent have provided 30 bespoke outputs in addition to those required by the sector methodology. Nine of these are identified as price control deliverables, three are ODI-F, and 18 are ODI-R.

We welcome many of these output proposals, and that much output funding is included in the baseline Totex, but are concerned that the £30m p.a. for additional costs of these outputs may not be justified. We would ask Ofgem teams to

investigate further to ensure that these outputs are appropriately targeted and offer value for money.

5.6.1. Customer Outputs

Early drafts gave little detail about Cadent's plans for customer service or complaints performance – perhaps not surprising as this is an area being driven forward by Ofgem for Draft Determinations. However, the details in the final draft were encouraging. We thought that the plan to segment their different customer groups and areas of performance, and to establish baselines and targets in each area showed both focus and ambition. We were encouraged that this work has already begun, including setting measures for household connections for customers living in multi-occupancy buildings.

These plans are backed up by a series of specific reputational incentive commitments. These include a range of welcome initiatives including time-bound appointments, better roadworks information and a commitment to coordinate better with others. Cadent estimates the costs of these initiatives as c£16m over the RIIO-2 period. However, it says it has not increased the baseline to allow for these but will effectively take them as an additional efficiency challenge over the period.

We welcome the ambition and commitment to improve service levels but have made our final rating amber, partly because these are promises built on a relatively poor track record. Cadent's ongoing Customer Engagement Group will be able to play an important role to help ensure that stretching targets are eventually set in these areas, and that the company is held to account for delivery. We note, as we discuss in the context of Cadent's vulnerability targets, below, that the current CEG has confidence in the company's ability to deliver, including its strong Board commitment.

The suggested target for the average restoration time for unplanned interruptions is a reduction of 10% in all networks for non-MOB customers and for MOB customers in East of England and West Midlands. For MOB customers in North London, the target is to achieve a reduction of 40% by the end of RIIO-1 and then a further 1% year-on-year reduction throughout RIIO-2. This RIIO-1 focus on their worst-served customers is appropriate but it was difficult to judge whether or not the other targets were suitable, particularly as Ofgem's intent is now to include large events in these targets. This area would benefit from further investigation for all gas distribution companies at the Open Hearings.

5.6.2. Vulnerability

Overall Cadent's proposals in this area are highly ambitious and demonstrate an intention to improve service provision dramatically. Cadent has shown a good understanding of the underlying position of vulnerable customers, and has engaged with the charities and others who work with vulnerability on a daily basis. Delivery of these proposals has the potential to improve the outcomes for consumers in vulnerable situations in these licence areas.

In October we thought Cadent needed to do more to evidence how they will ensure delivery of this work, and this has been improved in the December Plan. We also note that the CEG has confidence in Cadent's ability to deliver, including its strong Board commitment.

In the October Business Plan submission, Cadent demonstrated a high level of ambition alongside a well thought-through consumer vulnerability strategy. The substance of Cadent's proposals is positive, but the Business Plan presents some challenges in assessing these. This has improved since the October draft but it is still difficult to find distinct costs and justifications for each individual output. Cadent does provide additional information and evidence for these outputs in the Annexes, but we note that, given the resources available for review by the Challenge Group, this has been a difficult task.

There are several highlights to the outputs proposed by Cadent. In several areas Cadent has taken the outputs proposed by Ofgem and proposes to extend them to some degree. We welcome the proposed partnership working strategy, and the use of SROI to demonstrate the benefits of the proposals in this area.

In the October submission we found the use of SROI confusing in places. For example, it was not used to assess BAU activities in some cases, and, in others, several measures are packaged up together. We wanted to see a clearer exposition of these benefits clearly split out for each level of activity. This was better in the December draft with much more detail in the annexes (although it was still not entirely clear in the main Plan).

In October, Cadent cited stakeholder and consumer evidence throughout the proposals for consumers in vulnerable situations, but we wanted to see a better articulation of the impact of this evidence on the proposals and the trade-offs involved. This has been improved in the December submission, and is provided in detail in the annexes. We also remarked that, in the October Plan, it was often not clear why Cadent had favoured its proposed approach. Again, more detail has been provided on this in December. Like all the GDNs, ambition on FPNES is disappointing as the target is lower than in RIIO-1. Cadent argues that it is providing alternative interventions (5,000 in-home interventions, and 25,250 income and energy advice sessions) that address fuel poverty. However, these plans fall well short of the ambition Ofgem has set.

5.6.3. Bespoke outputs

Cadent is proposing a number of bespoke outputs in this area. These are either price control deliverables (needs identification, enhanced carbon monoxide awareness, additional fuel poverty interventions, income and energy efficiency advice, personalising welfare facilities, services beyond the meter) or reputational incentives (pioneering new funding model trial, targeting customers in fuel poverty). In particular, Cadent has proposed a bespoke target for getting MOBs back on gas in London which is welcome and reflects the particular needs of this licence area.

In October we thought that these proposals could provide valuable outcomes for consumers in vulnerable circumstances. However, we did not think that the evidence Cadent provided in the October Plan was complete. As a result, we did not feel able to say that these proposals reached the high bar required for bespoke outputs set out by Ofgem in its business planning guidance. Justification for these has been improved in the December Business Plan. We do think these proposals are valuable and will improve outcomes for consumers. However, we recognise the significant additional costs associated with these activities and challenge whether the level of SROI is correct. For example, the output delivering income and energy efficiency advice claims to provide more than £2,000 of SROI per person helped. But this

assumes that 64% of people will take action on the advice provided. This evidence comes from the trial Cadent has carried out in a pilot with Citizens Advice, but we have not seen any evidence that the advice would continue to have this level of efficacy if scaled up to the level that Cadent is proposing. We think this area warrants further scrutiny by Ofgem.

5.6.4. Resilience outputs

Asset resilience

Cadent's December Business Plan sets out the company's views on asset health, criticality and replacement priorities, focusing on the Tier 1 iron mains replacement programme and other high risk assets.

While the plan appears to deliver a resilient network, we are not certain that Cadent's cost-benefit analysis (CBA) fully demonstrates that the selected investment options deliver sufficient net benefit for existing and future consumers as a result of long payback periods. Our concern relates to the level of present and future gas demand. For example, the SGN NIC project "Real Time Networks" has indicated a potential significant fall in peak gas demand and this may be expected to continue as a result of Net Zero heat initiatives.

Given the expected future decline in gas demand, we think there may be further options that could be explored to reduce investments, particularly those with a long payback period.

Workforce Planning

Cadent's business plan sets out its strategic objectives for how it will develop a motivated, diverse, high quality, workforce fit for the future. Cadent sees a number of workforce challenges including a shortage of skills in key areas which they are seeking to address through their scale of resources across four networks.

However, we note that the workforce is competent for today's business which is focused on mains replacement and escapes and is not necessarily ready for a hydrogen future which potentially invests significantly in new assets with high technical content. For example, the number of Chartered Engineers will likely need to be increased in the future if the hydrogen pathway is taken.

Cyber Resilience

The Cadent Business Plan provides a good description of a BAU IT Security plan which proposes expenditure of £8.2m to offer over and above baseline protection. An incremental Cyber Resilience Plan in response to the Network and Information Systems Regulations 2018 is provided at a forecast cost of £14.2m.

5.6.5. Environment

The Plan has shown progress through the 3 drafts, including incorporation of a clear EAP. There is some evidence of responding to challenges from us and other stakeholders.

There is good evidence of stakeholder engagement and consideration of options (e.g. on fleet replacement). The intention to improve environmental management at sites is welcome, as are plans on enhancing biodiversity. Landfill targets are commendable. There is good analysis of embedded carbon. Good ambition on

scope 1 and 2 reduction is not fully matched for scope 3, and the ambition for reduction in shrinkage is behind that of some other companies. We would have liked to see more evidence of pushing the technological envelope on HGV emissions over the period to 2026, especially given that Cadent has facilitated or is facilitating installation of CNG filling stations in various locations.

In a number of areas the pace of change and short to medium term ambition could be greater. We are also concerned that the cost of delivering the fleet looks high and will need careful scrutiny.

5.6.6. Bespoke ODIs

Cadent is proposing bespoke reputational ODIs in relation to reducing carbon emissions, theft of gas, the target for avoidable waste to landfill and for work directed towards standardisation of connections. These are good elements of the EAP (although the offsetting required to achieve carbon neutrality warrants further consideration) but we are not particularly convinced that there is a need for a bespoke output beyond the proposed environmental reporting framework.

5.7. Net Zero/Whole systems

There is some good material in the Plan, and continuation and development of existing pilot proposals. The material under pathways to net zero is more balanced across the different pathways than some other Plans.

Among the pilots, HyNet and Hydeploy are both important, but the plan is not entirely clear on how far proposals are genuinely new, and the precise level of commitment is unclear. Equally, the pilots require partner input and support, and the extent of this is not fully evidenced.

References to entry capacity enablement and ‘supporting’ off-grid communities are both welcome.

The importance of whole system thinking is recognised at a high level, and their proposal for joint planning offices with electricity networks is evidence of some thinking outside the narrow confines of the gas sector. However, a number of the whole system proposals are at development stage only, and there is more work to do to create firm delivery plans for the firm outputs, which will be required.

5.8. Digitalisation plans

In our October feedback to Cadent, we asked them to consider plans to use smart meter data to improve network capacity planning, to seek opportunities to reduce gas pressures (and leakage), and to reduce reinforcement.

The December digitalisation plan appears to be high level and not very advanced – while objectives are set out it does not provide the evidence e.g. measurable outputs and actions, to show that it is an actionable Business Plan. Cadent appears to be at the early stages of their digital journey and are still putting their team in place.

Some of the concepts, e.g. a holistic view of asset data, and thinking, are extremely ambitious, but have not been costed or the benefit assessed, and usefulness remains to be proven, e.g. digital twin. Collaboration initiatives are missing except through ENA. Overall we feel that this is the weakest Plan across all GDNs and Cadent has a significant amount of work to do to catch up.

5.9. Managing Uncertainty

Ofgem's requirements for uncertainty mechanism submissions require companies to set out each risk with its materiality, frequency, trigger events, and probability and to explain where the risks lie, justifying the proposed balance of risk between company and consumer.

Our October feedback to Cadent noted that their Plan set out a wide range of undefined uncertainty mechanisms, including:

- Reopeners and volume drivers for Repex and Capex
- Reopeners for policy changes e.g. heat policy, HSE, cyber, legislation
- Project specific e.g. Traffic collision, High pressure valves

We asked Cadent to set out the potential costs associated with these and justifications for any additional uncertainty mechanisms to those proposed in Ofgem's Planning Guidance. We also asked for more information on how Cadent determined the potential cost and impact implications of these risks and how they have been allocated between consumers and the company.

Cadent is supportive of the sector uncertainty mechanisms proposed by Ofgem and a range of potential impacts has been outlined for each sector measure. In addition, the bespoke uncertainty mechanisms in Cadent's December plan are summarised below:

- Demand uncertainty
    - Connections (volume driver) - £26m to £40m
    - Diversions (reopener) - £15m to £40m
    - Reinforcements (volume driver) - £42m to £85m
- Legislative uncertainty
    - Obligations with respect to multi-occupancy buildings following Hackett review (reopener) - £6m to £39m
    - Traffic collision protection to be installed on governor valves (volume driver) - £10m to £20m
- Cost confidence
    - Pipes above Safety Threshold (volume driver) - £123m to £150m
    - High pressure valves (volume driver) - £17m to £26m
    - Lowestoft harbour asset health project (reopener) - £14m to £33m
- Heat policy
    - Entry charging and access review (reopener to trigger volume driver) - £60m to £108m
    - Fuel poor network extension scheme (reopener) – minus £9m to £0m i.e. funding is returned to customers if the scheme ends.

Cadent assess that all their proposed uncertainty mechanisms may have an impact of between 5-13% of Totex i.e. £348m to £895m. Our views on the proposed bespoke uncertainty mechanisms are:

- Demand - we agree that uncertain events such as major diversions could be addressed through uncertainty mechanisms, but think that connections and network reinforcement should be a normal business risk for the company up to appropriate thresholds.
- Legislative - we think a reopener is appropriate for major changes to MOB requirements as long as they are clearly defined as in excess of reasonable BAU expenditure, but that traffic collision protection should be a normal business risk.
- Cost confidence – we do not think these areas should be subject to uncertainty mechanisms and should be part of normal business risk for Cadent.
- Heat policy – Ofgem has already proposed a reopener for gas policy change. We do not think this should be fettered by adding additional bespoke uncertainty mechanisms for issues such as the charging review.

RPE - Cadent has carried out cost analysis which proposes an RPE indexation of 4.4% (or around 0.8% pa) over the RIIO-2 period, largely due to increasing labour costs. We think that most of these costs are under Cadent's control and where they are not, the magnitude is small, so we do not think these should be included in an indexation mechanism.

Overall, we think that Cadent has provided a set of uncertainty mechanisms which appears to exclude more risks from its normal business risks than we would expect. We expect Ofgem to validate and assess these proposals, taking account of potential bias to the company's benefit. Where Cadent's proposals are taken forward, we expect the benefits to the company of risk mitigation to feed into an overall calibration of risk/reward within the price control settlement.

5.10. Efficiency – innovation and competition

Innovation – Cadent expects to spend £53m on NIA projects during RIIO-1 on projects including the future of gas, resilience and environment. Cadent expect these RIIO-1 projects to deliver £2.7m pa of benefits during RIIO-2, and for RIIO-2 innovation projects to deliver an additional £7m pa by 2025/26.

Plans for funding new innovations in RIIO-2 are outlined together with increased collaboration with stakeholders. Cadent propose to use an undefined amount of BAU Totex and £40m of NIA funding for innovation to achieve:

- Improving customer experience, including £13m of NIA funding
- Whole system approach, including £3m of NIA funding
- Carbon neutral operations
- Resilience, including £24m of NIA funding

- Enhanced engagement

Cadent have also set out their HyNet proposal for hydrogen demonstration which it proposes could be introduced through a Strategic Innovation Stimulus or an Uncertainty Mechanism. We think that initiatives such as this should not be included in the RIIO-2 baseline but could be considered for a separate industry-wide competition for suitable projects to inform Government heat policy for Net Zero targets.

We also believe all GDNs including Cadent should show more ambition in taking forward previous innovation projects that may benefit consumers (e.g. plastic transmission pipelines)

Competition – While the Business Plan does not identify any projects that are suitable for early or late competition, Cadent has looked beyond Ofgem's early/late criteria to identify projects that might be suitable for other forms of competition. The HyNet project is identified (if it goes ahead), together with the HS2 diversions and Lower Thames Crossing work (although these are projects paid for by third parties), and the London Medium Pressure project although it would be difficult to separate from other Repex activities. Cadent also identify that they have opened up the design and build of >7 bar connections to competition by new entrants – we think this is a good initiative that other GDNs should adopt.

A description is provided about Cadent's approach to native procurement, noting that 71% of overall spend is tendered. Cadent do not specify the benefits that have been delivered but set out that they are taking forward initiatives to improve native competition. Cadent also identify the opportunity to extend native competition to metering services, Civil structures, and National Security Interventions. Cadent also propose to introduce an annual competition update to keep stakeholders informed.

The biomethane industry has made the case since 2014 for compression projects to create capacity for injection and this is an area that Ofgem should explore for competitive provision to increase innovation and reduce costs. We note the Cadent proposal on compression to create capacity but are not convinced this needs to be treated as innovation as it is technically straightforward and widely used in EU. We believe there should be a greater focus on implementation rather than pilots.

With the potential for clean gas only in new houses from 2025 it is important that Cadent seeks to enable greater competition in connections, not least to ensure that the competency provided by the 165 companies approved to carry out gas connections does not leave the gas industry with the prospect of hydrogen on the horizon. North Thames in particular might aim to use this resource to reduce the cost of replacement workforce costs.

Efficiency – Cadent has made a commitment for RIIO-2 of 0.94% annual Totex cost reduction, or 4.6% over RIIO-2. This is expected to be achieved by a mix of efficiencies realised from reduced operating costs from increased local management accountability, contracting best practice to drive replacement and capital efficiencies, and other innovations.

This is expected to deliver £155m of efficiency savings over RIIO-2. Given the £650m of efficiency savings that Cadent made over RIIO-1, and that it is still lagging other GDN's, we think a more ambitious target could have been set for RIIO-2.

5.11. Costs

5.11.1. Scenarios and forecasting

The Cadent plan is based on the ENA common planning assumptions, but their Plan has identified potential alternative pathways to 2050 ranging from decommissioning to repurposing to a hydrogen network though it is not clear as to the ability of the steel LTS to be used for hydrogen transmission and this is subject to ongoing research. Cadent state that they have not included any discretionary items in their baseline plan.

Cadent state that they expect to see annual gas demand declining but do not expect to see a significant reduction in peak demand, as this is driven by decentralised gas generation. Cadent have sought to address demand uncertainties through uncertainty mechanisms. The implications of falling gas demand in the low pressure network is not considered.

5.11.2. Cost review

Ofgem's planning guidance requires companies to justify costs, including cost drivers, consideration of options, and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

In our feedback on the Cadent July Draft Plan, we raised concerns that the information provided was incomplete and that the Totex forecast may be higher than necessary. We noted that engineering justifications were missing and requested further evidence to support the plan cost forecasts, including how efficiency and innovation would be used to reduce costs in RIIO-2. We also asked for a clear description of cost drivers between RIIO-1 and RIIO-2 and some Totex sensitivities.

In our October Plan feedback, we noted that the Cadent Totex forecast had reduced significantly and asked for further explanations of this change. We invited Cadent to provide a clear profile for mandatory and non-mandatory volumes, and associated unit costs, explaining the key changes between RIIO-1 and RIIO-2, including the efficiency gains they have realised and planned.

Also in October, we undertook a deep dive session with Cadent, exploring their approach to non-mandatory Repex, intervention techniques, and how their investment and maintenance approach might take advantage of reducing gas demand.

5.11.3. Costs - the Cadent December Plan

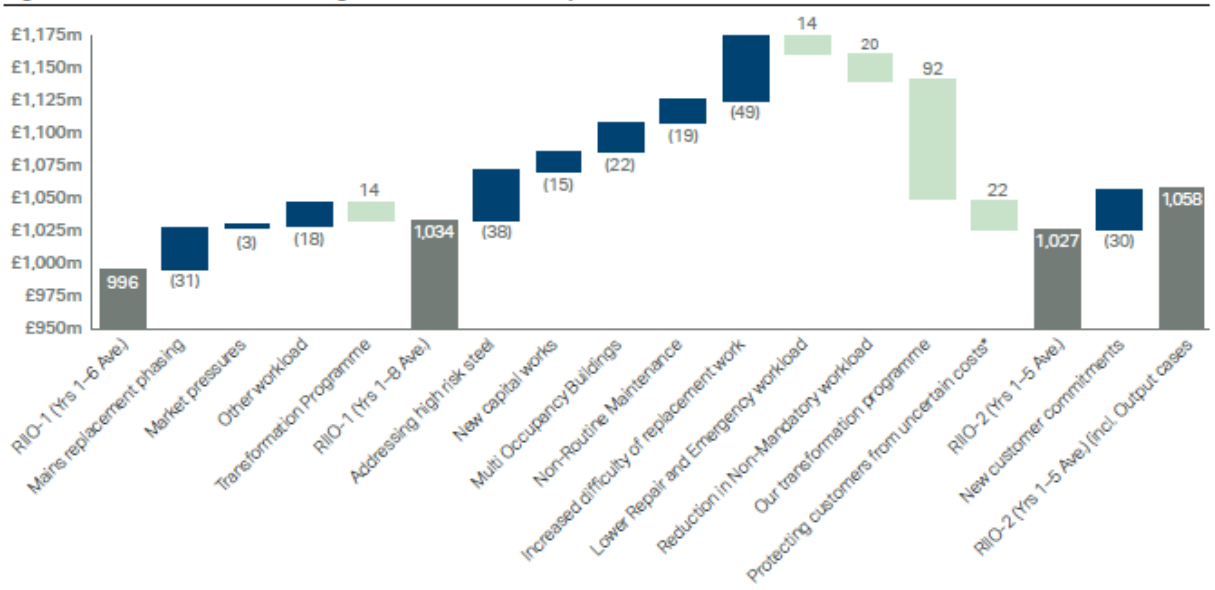
The Cadent Plan proposes expenditure of £5317m for RIIO-2 which is lower than the £5755m proposed in their July Plan, but a £150m increase on their October Plan. Cadent's Totex summary is shown below.

Table 09.05: Like-for-like totex summary

	RIIO-1			RIIO-2						RIIO-1	RIIO-2	Var
£'m (2018/19 price base)	2019	2020	2021	2022	2023	2024	2025	2026	RIIO-2 Total	Av.	Av.	Av.
Opex	423	434	384	415	403	403	385	385	1,991	448	398	(50)
Capex	160	218	190	157	180	168	140	109	754	153	151	(2)
Repex	432	526	538	478	479	480	478	476	2,392	432	478	46
Totex: Adjusted	**1,016**	**1,178**	**1,112**	**1,051**	**1,063**	**1,051**	**1,003**	**970**	**5,137**	**1,034**	**1,027**	**(6)**
Memo items												
Opex: Output Cases	–	–	–	17	18	19	19	20	93	–	19	19
Opex: Xoserve	10	13	12	–	–	–	–	–	–	15	–	(15)
Opex: Pension Admin	–	–	–	6	6	6	6	6	29	–	6	6
Capex: Output Cases	–	–	–	5	5	16	16	17	59	–	12	12
Capex: Xoserve	8	10	9	–	–	–	–	–	–	6	–	(6)
Totex: Reported	**1,033**	**1,201**	**1,133**	**1,078**	**1,091**	**1,091**	**1,044**	**1,012**	**5,317**	**1,055**	**1,063**	**8**

Cadent has also set out a reconciliation of changes from RIIO-1 to RIIO-2 as set out below. It identified the key upward and downward cost drivers. It also identifies £30m pa (£150m) of proposed new customer commitments, which if included would increase Totex to £1058m (adjusted) or £1063m (reported), resulting in a 1% Totex increase.

Figure 09.08: RIIO-1 vs RIIO-2 average totex (18/19 constant prices)



We have used the cost categories reported to Ofgem by Cadent in Business Plan data templates to assess Cadent's Plan. These are shown in the table below and are consistent with the cost categories used in the Cadent Plan document as summarised above.

We have compared RIIO-1 average (eight year actual plus forecast) expenditures with their RIIO-2 five year forecast equivalents. The table also shows the percentage of Totex that each cost category represents. We have used this approach to compare GDN expenditure forecasts for RIIO-2.

For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green). Table 1 below also shows the percentage of total Totex for each expenditure line, ranging from the lowest percentages being shown as green and the highest as red.

Table 1. RIIO-1 to RIIO-2 Cadent Cost Comparison

Cadent Total	GD-1 Average	GD-2 Average	GD-2 Total	% Change	% of totex
Direct Opex					
Work Management	109	88	440	-19%	8%
Emergency	54	50	249	-8%	5%
Repair	71	59	297	-16%	6%
Maintenance	76	100	500	32%	9%
Statutory independent undertakings (SIU)	-	-	-		
Other Direct Activities	27	16	80	-41%	1%
TOTAL DIRECT OPEX	337	313	1,566	-7%	29%
	-	-	-		
Indirect Opex	-	-	-		
Business Support	111	93	464	-17%	9%
Training & Apprentices	15	17	83	11%	2%
TOTAL INDIRECT OPEX	126	109	547	-13%	10%
	-	-	-		
Capex	-	-	-		
LTS, storage and entry	30	35	176	17%	3%
Connections	35	22	112	-36%	2%
Reinforcement (<7barg)	12	10	48	-20%	1%
Governors	7	3	17	-52%	0%
Other Capex	64	79	395	23%	7%
Transport & Plant	11	13	65	16%	1%
TOTAL CAPEX	160	162	812	2%	15%
	-	-	-		
Repex	-	-	-		
Tier-1	322	338	1,688	5%	32%
Tier-2A	5	3	13	-41%	0%
Tier-2B	14	3	15	-79%	0%
Tier-3	13	23	113	78%	2%
Other Policy & Condition (inc. MDPI)	19	45	226	140%	4%
Multiple Occupancy Buildings (MOBs)	19	24	118	24%	2%
Services Not Associated with Mains Replacement	41	44	219	8%	4%
TOTAL REPEX	432	478	2,392	11%	45%
	-	-	-		
TOTEX	1,055	1,063	5,317	1%	100%

5.11.4. Costs – Our review

We would make the following overall observations from this table:

- Average Totex increases by 1% in RIIO-2. This includes £30m of new customer commitments which are identified in the plan, excluding these would lead to a Totex decrease of 1%.
- Direct and indirect Opex show decreases overall. Maintenance costs show a significant increase but are offset by reductions elsewhere in direct Opex.
- Total Capex increases by 2% largely due to increases in the 'LTS, storage and entry' and 'other Capex' categories. These increases are offset by decreases in other Capex categories.
- Repex increases by 11%, driven by increases in Tier 1 Repex, the 'Other policy and condition' category, and MOB's. Tier 1 Repex shows a 5% increase. Repex remains the highest proportion (at 45%) of the total Totex.

We have then examined these cost areas in more detail across the four Cadent regions:

- West Midlands has a 7% Totex increase overall, driven by a 14% capex increase and 17% Repex increase.
- North West has a 5% decrease in Totex overall, with Repex staying flat and a 7% increase in capex being offset by Opex reductions.
- London has a 9% Totex increase overall, driven by an 18% Repex increase. In Repex, MOB expenditure falls by 11% despite London having the largest national population of MOB's. Tier 3 expenditure increases by £10m pa or 122%.
- East of England has a 5% reduction in Totex overall, with a Repex increase of 8% (largely driven by Tier 1 Repex) being offset by reductions elsewhere.

We have then examined some of these cost areas in more detail and set out our comments below:

- Repex – London and West Midlands have a significant forecast Repex increase whereas EoE and NW do not. We are concerned that this inconsistency demonstrates that Tier 1 expenditure has been deferred from RIIO-1 where it was already funded. We are concerned that the unit cost forecasts may be inefficient as well.
- Opex – maintenance costs are increasing by some 30% which appears to be attributable to a £19m pa increase in non-routine maintenance work shown in the Cadent RIIO-1 to RIIO-2 cost waterfall above. We are not confident about the justification provided for this increase and this is an area that we would expect Ofgem to review.
- Repex – the Cadent waterfall diagram shows cost increases between RIIO-1 and 2 being attributable to high risk steel. We believe some of this expenditure may have been deferred from RIIO-1, and Ofgem should review this work to ensure that the payback periods are appropriate (given falling gas demand and changing risk profile) and that a consistent methodology is being applied across all GDNs.
- Non-mandatory Repex – following on from the above comments, given the future demand for gas is falling, we suggest that Ofgem should review this area and explore opportunities to extend lives of assets where payback is more than say 10 years.
- Repex – the Cadent waterfall diagram shows annual increases of £22m for MOBs. However we are not clear that this is consistent with the proposed MOB expenditure reduction in London, the highest density MOB area. We note that Cadent has included some of their MOB in Opex and suggest these areas are examined further by Ofgem.
- Repex – the Cadent waterfall diagram shows an increase of £49m pa for increased difficulty replacement work. This would appear to demonstrate that more costly work has been deferred from RIIO-1 and we are concerned that this does not represent efficiency over the course of RIIO-1 and RIIO-2 but is as a result of Cadent exploiting options to defer work that reduced its costs in RIIO-1.

- IT – we note that Cadent propose total IT and cyber expenditure of £388m according to information provided in their business plan data templates.
- Mandatory Repex – this accounts for a significant amount of expenditure through to 2032. We would like Cadent, together with other GDNs, to work with the HSE to explore whether reductions can safely be made to the mandatory Repex programme during RIIO-2 and beyond. This would take into account the experience from 2002 to date and the statistics on escapes and incidents that have harmed members of the public.
- We understand expenditure is proposed to upgrade gas pre heating at a number of sites. At present such gas consumed (Own Use Gas) is a pass through cost and hence the use of heat pumps for gas pre-heating (which is a well suited technology given high temperatures are not required) is not economic. We would ask that Ofgem should review the incentives in this area to ensure that gas is metered and there are proper drivers to implement the most appropriate option and not just gas. This should be aligned with incentives to reduce shrinkage.

Comparison with other GDN's – Cadent is shown to be the least efficient GDN by Ofgem's latest benchmarking report. While a Totex increase of just 1% (including outputs) has included a welcome number of efficiencies and new initiatives, we await Ofgem's benchmarking analysis to see if this is sufficient to move Cadent to a frontier cost position during RIIO-2.

Our summary cost assessment

For our review of the Cadent December Plan, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements. For selected areas of expenditure, we have considered Cadent's justifications against the following:

- Is it needed? - The need case for the volumes of intervention, taking account of evidence such as actual asset condition, or customer requirements. While NARMS and monetised risk justifications are expected, we are also looking for corroboration from actual asset condition assessments.

  On Repex, while engineering justifications were limited initially, fuller documentation has been provided with the December Plan.

  We have not reviewed these in detail but they appear to provide a reasonable justification for the volumes of expenditure in the plan.

  On Capex, we believe that there may be options for deferring expenditure due to lower gas demand (new housing etc.) and this should be reviewed as a sensitivity.

  On Opex, we note that maintenance costs have increased significantly since RIIO-1 and the justifications for such a large increase in workload are unclear.

- What intervention? - The type of intervention showing that options have been considered and there is an appropriate balance between risk and value for money e.g. has lower cost refurbishment been fully considered.

Cadent appear to have undertaken a reasonable assessment of alternative intervention options. However we have not been able to undertake benchmarking across GDNs and would expect Ofgem to examine this area further.

- Is it efficient? – are unit costs efficient? Have efficiencies and innovation benefits been built in? Are risk margins being added to project costs?

  While Cadent has performed some external benchmarking of costs, this appears limited, and Cadent seems to rely on its own unit cost forecast. We anticipate that Ofgem benchmarking will help to give assurance in this area.

- Was it previously claimed under RIIO-1? – Is this an activity that appears to have been deferred from RIIO-1 and that customers have already paid for?

  Cadent has significantly underspent its allowance in RIIO-1 and is seeking an increased level of Totex in RIIO-2. Cadent has identified in its Plan that it has undertaken lower cost work in RIIO-1 and is undertaking more costly work in RIIO-2. Cadent has identified cost increases of some £140m pa (or 14% of Totex) between RIIO-1 and RIIO-2 – we think much of this may be deferred expenditure. This is a very important area and we expect Ofgem will review the details to ensure that RIIO-1 has not used up the easier work and pushed the more expensive into RIIO-2

Gas demand – with potential for clean gas only in new houses from 2025 and city targets for 2030 it can reasonably be expected that the Capex associated with new connections and reinforcement will fall significantly. There are other benefits from falling gas demand in terms of lower replacement, leakage and reinforcement costs. We would ask Ofgem to review these benefits to ensure they flow to customers.

Increases in expenditure in policy Repex areas should also be investigated further by Ofgem, in particular the benefits in terms of workforce availability from the end of new gas connections in new homes. This may be significant in North London which has a lot of growth and high pressure on labour costs.

Furthermore, we think non-mandatory replacement schemes with long payback periods should be reconsidered and Ofgem should review this to ensure a consistent methodology is applied across the country. Ofgem should also incentivise lower cost options where these can be accepted by the HSE (e.g. not replacing stub ends)

Overall, while we welcome the steps Cadent are taking to reduce costs, we think, subject to confirmation from Ofgem's benchmarking assessment, that Cadent's costs remain higher than that of other GD's and should be reduced. We have identified areas that we think Ofgem should review in order to ensure that the costs are appropriate.

5.12. Engineering Justifications and CBAs

In our feedback to Cadent on their July Plan, we noted that engineering justifications and CBA information was limited and asked for more detail.

In October, a wide range of information was provided. In our feedback, we said that while reasonable evidence appears to have been provided to support expenditure plans, further evidence should be provided as needed. We asked some specific questions:

- Holford Salt cavity E&I BPDT 09.15 Holford salt cavity E&I CBA - why is this facility required given fall in peak gas demand? The CBA says decommissioning in 2023 is not considered due to technical infeasibility – please explain? Cadent responded in December by identifying that forecast gas demand in that region was expected to increase slightly over the RIIO-2 period which we think is reasonable.
- Services Not Associated with Mains Replacement - £217.4m – Cadent provided a graph which shows 13 incidents in the period 1990 – 2010. We asked for an updated graph to 2018 to indicate if the level of risk is being maintained.
- The following chart was provided in December, indicating a significant fall in the number of incidents since 2010. As this trend applies nationally, we believe Ofgem consider whether this change in incidents should result in a reassessment of risk and the expenditure requirements. In particular if this trend continued into RIIO-2 period then it would be reasonable to challenge the 30-30 programme.

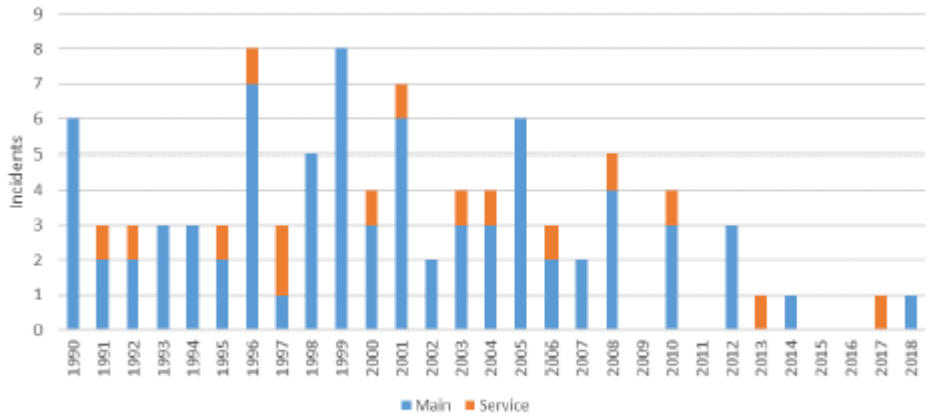


Figure 2: Incidents (explosions) Caused by Mains and Services Through Time (All GDNs)

- With regard to assets being potentially being readied for hydrogen in future, we note that, from trials to date, it appears that hydrogen leaks may not be any more significant than gas in terms of safety of the public (due to hydrogen dispersing very quickly) and hydrogen appears not to contribute significantly to global warming.

In December we found that engineering justifications had generally been enhanced and were provided for each of the key mandatory and non-mandatory expenditure areas. While greater justification has been provided and these are generally of good quality, many remain of a generic nature and it is possible that the results from the NARMs methodology and failure models may be subject to significant uncertainty and potential overstatement of risk.

Given the limited time we have had to examine these justifications, we must rely on further examination by the Ofgem teams. We would like to see more engineering justifications that are based on specific projects and use evidence of historic actual asset condition to corroborate asset health models. The key question for historic asset condition relates to the maintenance regime applied over the last 20 years and

whether shortfall in maintenance (giving short term boost to profits) has impacted on asset lives to the detriment of consumers. Whilst it is difficult to establish this we would expect Ofgem to review previous maintenance activity on a randomly selected basis.

CBAs have been performed for the major expenditure areas, considering options against a do nothing baseline. They provide a high level summary of the risks, costs and benefits that have been included or excluded in the analysis and calculations. The CBAs do not fully examine options for future energy scenarios with reduced gas usage and we are concerned that investment projects with long paybacks are being supported when deferment may be a better option for customers. Again, we would ask Ofgem to examine this area further.

5.13. Finance

We have evaluated the financeability section of Cadent's plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement with both appropriately qualified consumers and our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem's WAs.

We considered Cadent's July Plan to be non-compliant with Ofgem's Business Plan Guidance in a number of respects: the analysis for the Notional Company focused only on an increase in the Cost of Equity allowance as the means of improving financeability and there was no assessment of financeability for the Actual Company. The Plan targeted a BBB+ rating with no indication as to the reason for targeting a rating so much higher than that required for investment grade. Sensitivity analysis was incomplete and there was little evidence of engagement with consumers in relation to trade-offs in individual elements relating to financeability.

The October Plan was greatly improved and showed evidence of engagement with our commentary on the July Plan in particular in relation to Ofgem's Business Plan Guidance with which it was compliant in all significant respects: both the Notional and the Actual Company were modelled using Ofgem's WAs and a full suite of the sensitivities required by Ofgem presented. The Plan was clearly financeable on both a Notional and an Actual basis. There was some evidence of an attempt to involve consumers in discussions on issues relating to financeability, but our October feedback pointed out the need for more focused engagement, in particular in relation to the targeting of ratings higher than needed to retain an investment grade.

The December Plan showed further improvement and explicit references to our October commentary. The Notional and the Actual company are clearly financeable, as indicated in October, without the need for mitigating actions, with an equity return of 4.8% (and in our view probably also with an equity return of 4.3%, although this produces ratios just below those required for a BBB+ rating for the Notional Company without mitigating actions). However, despite our feedback in November that justification and evidence of detailed consumer engagement were required for the targeting of ratings higher than those needed to achieve investment grade, the target ratings remain BBB+: the company engages at some length with the argument that lower ratings potentially increase the cost of debt, but does not provide any quantitative analysis of the possible benefits, in terms of costs to consumers, of a

lower target rating. Although the company expresses some concern about reduced headroom in the latter part of RIIO-2, with an equity return of 4.8% and at 60% gearing the Notional Plan meets or very nearly meets the ratio requirements for a BBB+ rating in all but one of the Ofgem downside scenarios. For this reason, we consider Cadent's arguments for a higher Cost of Equity allowance to be superfluous. Its proposal for a higher Cost of Equity allowance is in a separate annex as requested but the sensitivity analysis in the plan does not support a requirement for it to be set at 5.6% (Real CPI) as the company is proposing. Despite this, the company argues that an expected equity return of 4.8% is not sustainable and will make it difficult long term to attract low cost equity finance from appropriate sources.

The Plan shows that Cadent has given consideration to a number of mitigation measures. However although the plan is financeable without further mitigation, we would have liked to see a higher level of ambition in relation to consumer costs. We consider the plan unnecessarily dismissive of the potential benefit for consumers of changes to depreciation and capitalisation rates, for example, and we would have liked to see more detailed quantitative analysis as to whether the targeting of higher gearing ratios (possibly in combination with reduced capitalisation rates and asset life) might reduce costs to the consumer. Equally, we note that the company did not choose to include the results of the financeability test of the 'real' Actual Company in the main business plan, but showed the ratios for the Actual Company on the basis of adjusting the forecast cost of debt to take account of the 2016 refinancing which we do not consider appropriate for a financeability assessment: it does not appear to reflect the Actual Company's forecast cashflows. Another example is the reference to a minimum requirement for an AICR of 1.4x to maintain an investment grade rating (when data elsewhere in the Plan confirms that an AICR of 1.4x is associated with a BBB+ credit rating i.e., well above the minimum investment grade rating of BBB-).

The Company takes issue with a number of Ofgem's WAs, including the immediate transition to CPIH, in support of its case for a higher Cost of Equity allowance. The latter would not only increase costs to the consumer but is unnecessary to achieve financeability on the basis of Ofgem's WAs.

The Company has undertaken some generalised engagement with consumers in relation to financeability issues but argues that the merits of targeting different ratings is too technical a subject for detailed engagement to be feasible. It acknowledges that it has not complied with our suggestion that it engage with consumers on depreciation rates but states that it intends to do this in 2020 ahead of the final determination.

Cadent has produced a full set of compliant sensitivity analysis and clearly shown that its Plan is financeable on the basis of Ofgem's WAs without the need for mitigating actions. However, we consider it could have been more ambitious in exploring ways of reducing costs to the consumer rather than placing so much emphasis on its view that there is a requirement for a higher Cost of Equity allowance.

5.14. Consumer Value Proposition

The Cadent CVP covers a broad range of aspects of the plan including efficiency savings, uncertainty mechanisms, initiatives to support consumers in vulnerable circumstances, customer service enhancements, environmental initiatives and whole

system thinking (all quantified) and a number of qualitative elements including stakeholder engagement commitments and a suite of improvements for customers in multi-occupancy buildings. The total claimed NPV, excluding uncertainty mechanisms, is over £500m.

The CEG has engaged extensively with the company in relation to CVP and this engagement has led the company to exclude some elements of the CVP. Our assessment, without the benefit of the CEG's level of scrutiny, is that there are several proposals which we do not support because we do not think they offer additional value to consumers. We do see merit in the following initiatives which will support customers in vulnerable circumstances or deliver improved service to customers and which we consider may go beyond what is currently good practice:

- **Pilot of a new cross industry funding approach to address fuel poverty** – we think this goes beyond BAU and is demonstrating something innovative
- **Never leave a vulnerable customer without gas** – this is an incremental improvement in relation to treatment of vulnerable customers after a gas interruption which goes beyond both required standards and industry practice.
- **Personalised welfare provision to customers in vulnerable circumstances** – we think this goes beyond the commitments of other GDNs but is perhaps not unusual for the utility sector.
- **Time bound appointments:** from our observation only one other GDN is proposing to offer this and we would encourage this initiative to help to ensure it becomes part of the service offered in the future (since there appears to be some evidence that it is valued by customers, although some GDNs were not convinced by sector wide customer engagement that it was valued by consumers).
- Our view would be that in both customer service generally, and provision for consumers in vulnerable circumstances specifically, benchmarking of the different service offerings will help to identify the elements which are genuinely beyond business as usual, given that standards are already relatively high. This might lead, for example, to recognition of Cadent's carbon monoxide commitments.
- In relation to the initiatives to reduce carbon, again we take the view that the carbon reduction commitments offered by the GDNs should be benchmarked to establish how the suite of initiatives proposed by Cadent compares with others. As noted in the overview our general position is that business carbon reduction is now part of BAU and should not automatically qualify for an additional reward.
- Finally we note that Cadent is offering a community fund financed by company profits, which had support from customers and a mixed reaction from the CEG. This proposal has the same issue in relation to funding that we have noted elsewhere – namely that a financial reward would undermine the shareholder funding.

6. Company Report - Electricity System Operator (ESO)

6.1. Summary

The following table sets out RAG ratings for the Electricity System Operator (ESO) final December Plan, together with the average of the RAG ratings we have given the ESO during its plan preparation stages.

ESO Plan theme	Plan preparation	December plan
Business plan commitment/assurance	n/a	n/a
Stakeholder engagement		
Vision: NetZero/Whole system		
Outputs: Theme 1 - control centre operation		
Outputs: Theme 2 - market development		
Outputs: Theme 3 - support network competition		
Outputs: Theme 4 - sustainable energy future		
Outputs: Resilience		
Digitalisation plan	n/a	
Efficiency - whole system	n/a	
Costs		
Engineering justification/CBA	n/a	
Finance		

Rating	
Green	
Amber/Green	
Amber	
Red/Amber	
Red	

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. These ratings reflected our view of the quality of the evidence and proposals that companies provided to us in their October Plan and during its preparation. Green ratings reflected where we thought the evidence was good; red reflected where we thought the evidence was weaker or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December plan ratings – our RAG ratings on the final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the plan is good and the company proposals are acceptable; red ratings reflect where we think the evidence provided is weaker and the company proposals are not acceptable. Our explanatory comments are provided in this report.

6.2. Introduction

Ofgem's price control regime and plan content requirement[16] for the ESO is different from the other network companies. Ofgem's ESO planning guidance requires that, by the beginning of the RIIO-2 price control period, the ESO must have in place:

- a **long-term vision** for the energy system that includes the ESO's view on its own roles and responsibilities in future. This vision could look out to 2030 or beyond
- a medium-term **strategy** that outlines the ESO's strategy for progressing towards the long-term vision over the five-year RIIO-2 period. This strategy

[16] https://www.ofgem.gov.uk/system/files/docs/2019/05/riio-2_sector_specific_methodoloy_decision_-_eso.pdf

should consider those elements of the price control arrangements that are expected to be fixed across the full five years

- a shorter-term **Business Plan** that details the ESO's costs, activities, deliverables and performance metrics for delivering its strategy over the first two years of the RIIO-2 period.

In undertaking our evaluation, we have sought to align our assessment with the key themes for the other network companies but have also addressed areas specific to the ESO.

As with other plans, we have considered whether the ESO plan is ambitious, responsive to stakeholders, cost-effective, and whether we are confident in the company's ability to deliver the plan.

The following pages in this section set out our assessment comments for each key theme.

6.3. Track record

The ESO did not have its own RIIO-1 price control but was integrated with NGET until 2019. Balancing costs, which the ESO manages, have stayed broadly flat over the first half of the price control period but have increased over the last few years. The ESO is subject to a separate performance regime. Totex performance is discussed in the costs section.

6.4. Stakeholder engagement

We are looking for business plans that set out: how they have been designed using enhanced engagement processes including with company specific groups and with us; and how they have been ambitious, transparent and responsive. The plans should set out the company's approach to ongoing engagement in RIIO-2, including a strategy for engagement as well as a set of commitments to deliver the strategy.

In our feedback on the ESO's July plan, we advised that we were keen to understand how stakeholder engagement had been used to build the plan, and how the forward-looking engagement would work and be measured and assessed; also how management incentives would be linked to outputs or other measures of consumer benefit

In October we commented that the ESO's stakeholder engagement appears to be extensive although many of the stakeholders are existing industry participants. It's not clear from the plan how this engagement translates into buy-in by stakeholders who will need to help deliver the plan.

Our view following receipt of the December plan is that engagement to develop the plan was extensive and iterative, with stakeholders re-engaged at each stage of the ESO's strategic planning. Stakeholders' views are clearly set out - at an overall and on an issue-by-issue basis. End consumers were not directly engaged, but there was good engagement with a wide range of representative groups and a number of sources of robust consumer insight on relevant issues have been used. The plan sets out clearly how the team has triangulated these insights - and explains the consumer priorities they have developed as a result. We think this lack of direct consumer engagement is acceptable at this point given the broad strategic thinking that the ESO has been doing at this relatively early stage in its development.

In terms of the future strategy, the approach described is strategic and ambitious. It recognises the importance of KPIs to measure its success, including identifying 'evidence of where we have acted on stakeholder feedback'. It also builds in oversight and leadership from the top, in the form of a CEO-chaired 'Customer and Stakeholder Experience Board'. There is a commitment to benchmarking best practice not only within the energy sector but also beyond.

However, the strategy is fairly high level at this stage with little detail in some areas. In particular, we thought the ambitions around 'representing and championing the consumer experience, in line with our mission' were interesting but little developed. We'd like to see the ESO do further early work in this area so that they are clearer how and where they can add unique value as a 'consumer champion'. This would include clarifying their thinking on where direct consumer engagement fits in; the plan acknowledges that they remain unclear about this. There is also a commitment to continue to use an 'evolved' version of their independently chaired stakeholder group but the plan says little about how it envisages deriving additional value from this group. The ESO is currently 'exploring the potential remit' with the Chair and members.

We have challenged the ESO to demonstrate how engagement has translated into effective partnership with stakeholders who will be essential to help deliver the ESO's mission. The December Plan responds to this by articulating more clearly where partnership commitments have already been made, as well as setting out in general terms that 'building trust' and 'building partnerships' will be key to delivery. In future, given its role, we think it is essential that the ESO engages with the widest possible range of stakeholders, in particular smaller new entrants to the system.

6.5. Vision – Net Zero and whole system

We think the ESO's plan should clearly demonstrate its longer-term vision for the energy system - for example in terms of whole-system approaches, innovation, consumer value and long-run costs and benefits. In our October feedback we commented that the plan set out a challenging ambition for zero carbon power system operation by 2025. It also considers a wide range of potential future scenarios and their impacts on delivery. More specifically:

- Plan vision and ambition – we were keen to understand the specific activities to deliver the carbon-free flexible power system by 2025, and particularly how coordination with other industry participants was going to be achieved.
- Future scenarios – we asked the ESO to show how the implications that using the four FES scenarios as viable options impacted its plans for each output theme.
- Delivery - the plan does not yet show how this ambition links to the chosen activities with their associated costs, deliverables and performance measures.

We thought the December Plan sets out a challenging and laudable ambition to enable zero carbon power system operation by 2025. It also considers a wide range of potential future scenarios for net zero and their impacts on delivery – against the general recognition of an increasing and critical role for electricity distribution and transmission.

In our assessment we also focused on how the ESO proposes to extend its role beyond delivering electricity security of supply, to also facilitate the cost-effective transition to a low carbon energy future through a 'whole energy system[17]' approach. This could include initiatives to optimise the utilisation of power and other energy systems through non-network solutions for example. The ESO recognises the importance of this but the role it will take (whether one of leadership or otherwise) is not clear. While there are arguments for the ESO to take a greater overall leadership role, this also presents significant challenges and may have unintended consequences. We think that this is an area that must be clarified without delay.

Our comparison across the plans of the ESO and ET companies also suggest there remains some lack of clarity about specific roles, at least at the margin, in delivering net zero and the move to a whole system approach. We are not convinced therefore that gaps do not remain, which the ESO ought to be filling, or unnecessary duplication of effort. There is also (or perhaps because of this) an incomplete mapping from net zero to all the activities which are needed to deliver this.

There are some aspects that show promise and innovative thinking. For example, the proposed 'digital twin' approach, appropriately delivered, has the potential to help the sector better discover system efficiencies in the move towards net zero, and avoid transitional costs and risks. However, the execution of this platform is not sufficiently well advanced (nor arguably could it be at this stage) to give us assurance that this will be realised and will reap the claimed benefits.

A corollary of this (see our comments on costs, below) is that there does not seem to us to be robust prioritisation across what is a complex capital programme. We remain concerned that critical elements may be undercut by fire-fighting/diversion of effort to earlier but less critical elements of the programme should the ESO come under delivery pressure.

Nevertheless, the business case for investment in a more digitalised ESO appears to be justified, given that it can play a critical role in delivering cost-effective energy system decarbonisation. We think that appropriate governance mechanisms will be essential if delays and nugatory investment are to be minimised.

6.6. Outputs

6.6.1. Theme 1 – Control centre operations

This output theme has evolved over time from one focusing on system balancing and is now focused on control centre operations, delivering control centre infrastructure which can carry out today's needs and be able to adapt to the future changing energy landscape with high levels of renewables and dynamic demand. The plan includes proposals for enhanced control centre automation and a digital twin of the control room IT estate that can allow simulation of market and system operation.

In our earlier feedback, we commented that the full project scope did not seem to have been defined or alternative options fully evaluated. We asked that the plan should show the inter-dependencies associated with planned activities in Theme 2. Risks to delivery and mitigations should be addressed. Performance measures and targets should be improved and aligned with CBA benefits.

[17] We consider 'whole energy system' to go beyond the traditional electricity generation, transmission and distribution sectors to include all aspects of the energy system impacting consumers.

The December Plan provides further details of the proposed design, also explaining how an advisory design authority will be developed, potentially including some external stakeholders. The ESO will retain decision making responsibility. The ESO has also identified the linkages between this theme and proposals in Theme 2 for the development of future flexibility markets. The plan proposes that detailed design will be completed in 2020 with delivery of the key elements being phased to 2025. Performance measures include balancing costs, demand forecasting and security of supply.

We think that the ESO's plans are highly ambitious and discuss the risks later in this document. However, we welcome the more detailed evidence that has been provided, including the proposed performance measures.

- While we support the development initiatives for this theme in principle, we are concerned about delivery and benefits being realised, and suggest that the costs and benefits are reassessed once the detailed scoping and costing is completed. This should include an assessment of costs and benefits across the whole energy system i.e. including DNOs and distributed energy providers.

6.6.2. Theme 2 – Market development and transactions

In our October feedback to the ESO, we questioned whether it had:

- considered all the design options and gained support of stakeholders/Ofgem/BEIS for the market designs it is planning to implement, and
- whether the ESO is the right organisation to deliver and operate this new IT system.

We also commented that its plan should show how future market design changes may be efficiently accommodated within the IT development plans. The full project scope did not yet seem to have been defined or alternative options fully evaluated. We also asked that risks to delivery and mitigations should be addressed.

Performance measures and targets should be improved and aligned with CBA benefits. The plan should also set out how the ESO's code management leadership and performance will be improved to ensure that market changes can be successfully implemented.

In its December Plan, the ESO describes its aims to deliver closer to real time markets for balancing services, and enabling market access for all participants at 1MW and above. The plan aims to develop a new digital market platform to transform the process for market participation. It also plans to enhance its code management performance.

The ESO has set out a plan to build a single integrated platform that will allow participants above 1MW to access balancing and capacity markets, allowing the ESO to procure balancing services more efficiently. It has based its market design on customer feedback that they must be able to stack revenues. The ESO proposes to introduce common standards, data models and interoperable systems, and consider how they interact with other markets. The ESO also says it will lead a review of wholesale, balancing and capacity markets to deliver a solution (by 2026)

about how these markets will evolve to provide price signals in a world of high volumes of zero marginal cost generation. The ESO also plans to produce a digital grid code.

Performance metrics include a measure of how many balancing services are competitively procured, capacity market demand forecasting accuracy, and continuing customer surveys for code administration.

We support the proposals of the ESO to improve accessibility to, and competition in, closer to real-time balancing markets, and its plans to improve its code performance. However we are concerned that:

- the 1MW proposed limit will curtail access to many participants in a growing distributed energy landscape, although we recognise that roles and responsibilities for engaging with smaller participants have yet to be resolved
- the market design may restrict the types of technologies and products able to participate, and present a barrier to new entrants
- the proposed review of the interaction between balancing, capacity and wholesale markets should deliver much earlier than 2026, addressing issues such as non-network solutions, price signals for new balancing investment, and charging arrangements
- the market review may result in significant design changes for the proposed platform that have not been anticipated
- the need to provide long-term price signals for new balancing investment appears not to have been considered. It should specifically address how long- and short-term price signals may be signalled to optimise future investment
- the options for competition by third parties for delivery of market platforms and code governance has not been considered
- the performance measures are weak in this area. We think they should be targeted more closely to achieving the long-term CBA benefits.
- Overall, we think this is an area that needs close oversight from Ofgem to ensure that the benefits can be realised in a timely way and that the proposed changes do not result in new complexity or market barriers being created.

6.6.3. Theme 3 – Unlocking consumer value through competition

Our October feedback noted the initiatives planned to enhance the NOA and introduce commercial inter-trip schemes, potentially leading to significant consumer benefits. We asked that the plan should address how delivery inter-dependencies with other industry participants and network companies can be achieved. Risks to delivery and mitigations should be addressed. Performance measures and targets should be improved and aligned with CBA benefits.

The ESO claims that its NOA document already saves billions of pounds for consumers by recommending which network investments should take place. It plans to embed competition for all solution types to meet transmission needs and expand the scope to end-of-life extensions, connections wider-works, and to support decision making at the distribution level. We note that the ESO's programme sees

the development of analytical tools taking place over the first two years of RIIO-2 with implementation after that. The ESO also proposes a review of SQSS to begin at the start of RIIO-2 and run for four years. Performance measures for the NOA are expected to show benefits against a counterfactual of what constraint costs might have been expected if the intervention was not made.

We welcome the initiatives that the ESO has proposed in this area, especially in reaching out into the wider energy system to seek benefits, but we have a number of concerns.

- The NOA development is conditional on obtaining power system data from third parties and it is unclear how this data will be obtained and how its reliability will be assured. The NOA does not seem to be effectively co-ordinated with the investment plans being put forward by electricity transmission companies for RIIO-2 and optimisation opportunities may be being lost. We are concerned that the NOA will not enable competition between TO's, DNO's and flexibility providers to realise the optimum solution for customers.
- DNOs claim they have greater capability to understand their systems which are different from transmission networks, and distributed energy resources may not be well understood by either the ESO or DNO. While the ESO is proposing to act as an advisor, it's not clear how this arrangement will work.
- The statements about embedding competition are quite high level and do not give confidence that there is a clear plan for implementing this.
- The NOA is an advisory document in support of TO investment plans and Ofgem's price control decisions. It is unclear how these relationships will work in future alongside providers of non-network solutions to deliver the benefits envisaged.
- On SQSS, we think there should be a more fundamental review (perhaps led by BEIS or Ofgem) and this should review the potential for non-network and new technology solutions alongside overall resilience criteria. We think this should report sooner than currently envisaged by the ESO.

As described above, we have particular concerns with the current NOA and future ESO proposals and how it will contribute to effective system planning and optimisation and address strategic needs for both network and non-network solutions. The electricity transmission companies refer to the NOA in their RIIO-2 plans but much of the investment appears to be based on their network plans and the contribution of the ESO appears limited.

In our consideration of transmission plans we have concerns that there may be alternative, lower-cost solutions to reinforcement expenditure, or that more significant strategic investment decisions haves not been taken. The ESO should be able to assess and advise on these choices. On the one hand, we fully recognise and support the need to protect customers from nugatory investment, hence our support for seeing needs justified in investment decisions in the NOA and SWW process. But on the other hand, we do recognise it as a potential barrier to more strategic developments. We would therefore like to see more formal processes to

build future option value into strategic development assessment, including NOA, and individual SWW reopener assessments.

6.6.4. Theme 4 – Driving to a sustainable whole-energy future

In our October feedback we commented that the plan aims to improve operational and planning data interaction with DNOs/DSOs leading to significant consumer benefits. However, the full scope does not yet seem to have been defined or alternative options fully evaluated. The plan should describe how the key risks are addressed and particularly how joint scoping and delivery interactions will be agreed with other industry participants. Performance measures and targets should be improved and aligned with CBA benefits.

The ESO's December plan sets out how it proposes to provide deeper insights into policy areas, offer new transmission network connections, and manage overall system operability. It will work more closely with DNOs, enhance the FES report and engage more widely on energy transition analysis and insights. The System Operability Framework and other technical information will be enhanced, and Regional Development Plans will be pursued further. However, most deliverables appear to complete in the latter years of RIIO-2. Network planning is also enhanced. Performance measures compare future balancing cost savings based on the counterfactual of taking no action.

Again, we welcome these initiatives but are concerned that they appear to be dependent on other investments planned in Themes 1 and 2, especially the availability of third party data. The delivery timescales are quite long.

In this area, we note that the roles and responsibilities of industry parties are yet to be defined, that there will be considerable complexity in making changes to existing industry rules and practices, and that this is likely to place barriers to these developments unless addressed. The ESO's plan does not explain how such barriers may be addressed.

6.6.5. Output: Resilience

In our review of resilience for the ESO we have focused on workforce resilience and expect Ofgem to consider cyber and physical security plans.

In October we commented that the ESO plan provided a helpful description of the company's approach to resourcing and workforce planning, but asked how resilient this plan was to the increasing organisational demands caused by the wide range of planned IT and associated operational practice developments.

In December, the ESO sets out its plans for creating an inclusive and diverse workforce with fair and benchmarked pay and reward. It highlights a plan for training, recruitment and hiring contractors to have the right capability mix.

To address IT capability matters, the ESO sets out its plans to create an internal delivery body led by a business programme director to augment other skills. While we welcome the additional steps that the ESO has proposed to manage a major IT delivery programme, we remain concerned that this planned step change in IT developments presents risks both in achieving delivery aims but also in addressing the associated transformation of the organisation. This is likely to be exacerbated by

the ongoing process of the ESO establishing itself in its independent role in the industry.

Overall, we have concerns that the workforce plans set out by the ESO do not yet sufficiently address these matters.

6.7. Digitalisation plans

We are seeking the ESO's digitalisation plan to address:

- A digitalisation strategy addressing digital and data best practices, together with digital architecture design and associated delivery plans.
- How these are being coordinated between network companies and wider digital initiatives.

Between the ESO's October plan submission and its December plan, considerable work seems to have gone into the IT strategy and delivery materials. The ESO digitalisation strategy is well set out together with high-level delivery roadmaps and supporting details. While this strategy is clear and the submitted level of detail is welcome, we still have concerns that it is well short of the sort of detail, milestones and individual capabilities/dependencies information that would normally be expected to justify funding for such projects.

While individual project information has been provided and is well set out, we are unclear about the process for getting approval to pursue these projects. For example, will the projects be approved by Ofgem as part of 2-yearly business plans? It would have been helpful to set out this process to give transparency about the decision stage gates. Our detailed comments on the plan are:

- There is a good articulation of the current state versus future state IT investment.
- The Risk section is improved, including more dependencies. This was a key earlier challenge that we raised. However, we still have concerns about under-estimation of risk impacts, for example the projects relating to a) real time balancing, and b) single markets platform where the likelihood of delay is given as low but without an explanation of impact.
- Pros and cons remain somewhat unbalanced but the need for transformation is made clear from the articulation old versus new system capabilities.
- Many of the roadmap timelines appear quite generic and similar.

Following our request in October, the ESO has provided an independent range of costs from Gartner for each project. We remain unconvinced about the relevance of Gartner price comparisons since the ESO is proposing an overhaul of almost every system, and yet comparing costs project by project when they are meant to be modules built in reference to one another. We are concerned that this means there is risk of cost duplication and risk margin duplication in these forecasts.

We are unconvinced that some projects are indeed separate – for example, Digitalisation/Open data investment and Data Collection/Asset registration - and, as a result, we are concerned that there may be duplication of costs and risk margins.

We would like to see effective governance established with transparent milestones, gateways and governance for approving ESO IT expenditure. We understand more detailed delivery plans will be produced by the ESO during RIIO-2 and governance arrangements will be enhanced through a design authority. We would like to see this opened up to ensure effective engagement with all industry participants.

We also have concerns about the interactions (including real time) proposed with DNOs and DSOs, distributed generators, and other parties, and whether these proposals have properly taken account of the counterparty scope, design, cost and delivery factors. This will be an important aspect for the digital twin and other initiatives.

The ESO plan includes proposals for wider collaboration with industry stakeholders as part of its IT plan delivery and innovation development process. While we welcome this collaboration, the plan indicates that the involvement of collaborators in new IT initiatives may be unduly limited, which is a concern. The plan does not provide much detail on how interactions with industry participants would work – for example, linking up with aggregators.

We welcome that the ESO is adopting the Energy Data Task Force Recommendations and taking an approach where data is "presumed open", and the benefits that this should provide to third parties and more collaborative solutions in future.

We are also concerned that it not very clear what role the ESO sees itself playing in IT delivery. For example, is it a platform that allows others to innovate, a software provider that delivers IT solutions, a procurer of IT solutions, a trusted collaborator and partner, or a combination of these? In this context, it is important to note that the ESO almost wholly relies on National Grid Group for the provision of its IT capabilities.

We think the ESO’s relationship with National Grid Group as software provider may constrain its ability to deliver the necessary software solutions. We also have concerns that the ESO can deliver everything it is aiming to do, through its own IT systems – we think there may need to be a greater role for third party SaaS providers.

Overall, while the further development of the digitalisation plan is welcome and should provide a valuable contribution to the optimisation of system costs and enabling the energy transition, we think there are a number of issues to be addressed to ensure the benefits can be realised.

6.8. Whole system efficiency

The ESO has a key role to play in optimising the efficiency of the whole electricity system, engaging with other industry participants, including Transmission and Distribution companies to optimise network solutions and with energy market participants for energy and other non-network solutions. The ESO is able to identify initiatives that may significantly impact other company plans. While we did not provide feedback to the ESO in October in this area, this is an area of focus we have identified following receipt of the final electricity transmission plans.

In this section we have provided our comments on how we think the ESO has impacted the electricity transmission company plans for RIIO-2, together with the ESO's proposals for innovation, aimed at delivering longer term optimisation.

Optimising electricity transmission plans

In RIIO-2, electricity transmission companies are required to set out their proposed investment plans for load-related and reinforcement expenditure. These have mainly been based on the generation scenarios in the ENA common scenario and most have also considered the evidence from the ESO FES report and the projects identified via the NOA process. These projects are presented for approval by Ofgem, often quoting the NOA document. Many uncertain projects are presented with often complex uncertainty mechanisms to ensure that funding may be obtained. In some cases, anticipatory investment is identified.

We don't think there is evidence of sufficient co-ordination between the ESO and the TOs in their plan development and the assessment of alternative investment options. The current NOA process doesn't seem to consider all the relevant factors or align with the requirements of the price control process. Furthermore, it is unclear how this coordination will be addressed during the price control to ensure that the optimal investments are being made, or other solutions sought. While we understand that the ESO's role in this area is not clearly defined, we think the ESO could have been more proactive in TO plan development to ensure that options were being considered and the optimal long-term solution found. We would like to see the ESO:

- Take the lead in coordinating network planning and seeking optimal solutions
- Exploit the opportunities to use alternative solutions, e.g. smart grid technologies, and flexibility services, where beneficial
- Take a more strategic approach to network and system planning to exploit whole system opportunities, rather than the current more incremental approach

6.9. Innovation

In October, we commented that the ESO had set out its approach to innovation with a number of specific innovation projects in its baseline plan, alongside its proposed NIA projects. We questioned, given the ESO will be at the heart of the energy transition, how its plan will support future innovation developments initiated by others and what impact this will have on its IT development programme.

In its December plan, the ESO concentrates on longer-term projects that yield improvements over a longer timeframe. It highlights the shorter-term projects that are associated with delivery of the 5 year RIIO-2 plan, and points out that it thinks its RIIO-1 innovation funding limit is constraining its ability to innovate.

The ESO's innovation approach appears to engage with and allow industry participants to raise issues alongside the ESO which is welcome. It is proposing an innovation allowance of £50m over the course of five years (around 4% or Totex), which could (based on its illustrative prioritisation) be invested in the following areas of its proposed innovation strategy, which will be refreshed each year following stakeholder engagement.

ESO innovation priority	Investment split (%)	Total RIIO-2 stimulus (over 5 years)	Theme allocation
System stability	22%	£11m	1 (100%)
Whole electricity system	19%	£10m	4 (100%)
Future markets	17%	£8m	2 (100%)
Long-term behavioral change in supply and demand	14%	£7m	1 (100%)
Digital transformation	11%	£6m	1 (50%) and 2 (50%)
Whole energy system	8%	£4m	4 (100%)
Constraint management	6%	£3m	1 (50%) and 3 (50%)
System restoration	3%	£1m	1 (100%)

We note that, unlike other network companies, the ESO is likely to realise benefits for other industry participants from its innovation initiatives, and we would support additional investment in this area subject to the normal innovation approvals of projects on their individual merits, and ensuring open access to wider industry participants.

6.10. Costs

In reviewing the ESO's costs, we have considered the following areas which the ESO was required to address by Ofgem:

- historic and forecast costs broken down by activities and sub-activities, with clear links between activities, sub-activities, deliverables and the performance measures
- separate reporting of business support costs, clearly describing costs from wider National Grid group
- comparable external benchmarks for activities and deliverables
- proportionate cost benefit analysis and justification for the proposed expenditure (see CBA section)
- identification of uncertainties around deliverables.

Our comments to the ESO following its draft July Plan highlighted our concern that costs were higher than necessary (around £100m pa higher than current levels) and asked for more detailed justification, particularly for IT costs and Opex efficiency assumptions together with evidence of delivery plans.

We also asked for cost reconciliations from current levels to those in the plan, explaining the upward and downward cost drivers, together with any uncertainty mechanisms and requested a Totex sensitivity to show the implications of keeping costs at current levels. We questioned whether the costs and benefits were realistic and whether all options had been assessed; also whether there was double counting of benefits.

In October we noted in our feedback that improvements had been made, and requested further improvements to show a direct link between activities, costs, deliverables and performance targets. We asked for the different options and factors that were considered in designing the plan so we can have confidence that it offers the optimum approach to benefit current and future consumers.

In addition, we held deep-dive sessions with the ESO in October, particularly focusing on cost, delivery and risk of IT projects, and understanding the breakdown of ESO costs that are attributable to services provided by National Grid Group. The subsequent information that was provided highlighted that about 75% of ESO costs planned for RIIO-2 were attributable to services provided by National Grid Group, putting them in a dominant supplier position.

In its December Plan, the ESO provides the following cost forecast, which compares proposed expenditure with that for RIIO-1. This shows a c40% annual increase in Totex between the two periods largely driven by additional IT costs. Total IT costs over the 5-year period are identified as £807m, 61% of total Totex for RIIO-2.

Table 1 – ESO Summary totex

ESO £m (18/19 prices)	Business plan location	RIIO-1	2021/22	2022/23	2023/24	2024/25	2025/26	2 year average	2 year total
Ongoing opex	See table 2	62.7	71.4	70.4	70.7	69.7	66.4	70.9	141.8
Ongoing business support opex	See table 2	22.1	16.3	16.3	16.4	16.6	16.6	16.3	32.5
Ongoing IT opex	11.1.	39.7	58.4	56.0	54.8	56.5	58.8	57.2	114.4
Ongoing business support capex	See table 2	1.7	2.3	4.3	2.3	2.7	2.7	3.3	6.6
Ongoing IT capex	11.1.	56.1	59.0	38.9	33.1	32.1	30.7	48.9	97.8
Transformational opex	Annex 2	-	3.9	6.3	7.2	8.1	7.2	5.1	10.2
Transformational IT opex		-	13.1	15.8	20.9	22.1	25.1	14.5	28.9
Transformational capex		-	34.9	47.0	59.5	53.4	45.0	40.9	81.9
Total		**182.3**	**259.2**	**255.0**	**264.8**	**261.2**	**252.4**	**257.1**	**514.1**
- Opex		*124.5*	*163.0*	*164.8*	*169.9*	*173.0*	*174.1*	*163.9*	*327.8*
- Capex		*57.8*	*96.1*	*90.2*	*94.9*	*88.2*	*78.4*	*93.2*	*186.3*
- Total		*182.3*	*259.2*	*255.0*	*264.8*	*261.2*	*252.4*	*257.1*	*514.1*
- Transformational opex & capex	Section 3.1.3	-	*51.9*	*69.1*	*87.6*	*83.7*	*77.3*	*60.5*	*121.0*
- Ongoing opex		*62.7*	*71.4*	*70.4*	*70.7*	*69.7*	*66.4*	*70.9*	*141.8*
- Ongoing IT opex and capex		*95.8*	*117.4*	*94.9*	*87.9*	*88.6*	*89.5*	*106.1*	*212.2*
- Ongoing business support opex & capex		*23.8*	*18.5*	*20.6*	*18.8*	*19.2*	*19.2*	*19.6*	*39.1*
- Total		*182.3*	*259.2*	*255.0*	*264.8*	*261.2*	*252.4*	*257.1*	*514.1*

Note: RIIO-1 number is based on a two year average for Opex, and an 8 year average for Capex

We have also examined the submissions made by the ESO in its December BPDTs which compare the costs across the key output areas. These are set out in the table below. They are largely comparable, but the like-for-like BPDT submission shows a slightly higher increase in overall Totex, which we understand is attributable to pension administration costs and innovation funding.

For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Table 1: RIIO-1 to RIIO-2 ESO Cost Comparison

Funding Category	RIIO-1 Average (8 yrs)	RIIO-2 Average (2 yrs)	% Change
Operational Support	6.3	6.7	8%
Operations	19.2	24.1	25%
Total Short Term Costs (role 1)	25.5	30.8	21%
Charging	4.1	3.6	-13%
Codes	6.1	10.6	75%
EMR	2.1	3.3	60%
Total Market Development and Procurement Costs (role 2)	12.2	17.5	43%
Medium Term Network	6.4	8.6	33%
Strategy	2.1	2.4	13%
Scenarios	1.2	1.3	4%
Long Term Network	6.2	6.8	10%
Total Long Term Costs (role 3/4)	16.0	19.1	19%
Supporting Operational Costs	6.7	7.7	15%
Total Operational Costs	60.5	75.2	24%
Business Support	52.7	80.4	52%
ESO Capex	47.7	84.5	77%
Total System Operating Costs	160.9	240.1	49%
Other Costs Within Price Control	15.0	19.8	32%
Total Costs Within Price Control	175.9	259.9	48%

Business support costs: the ESO uses business support services from National Grid Group, including IT, property, HR, procurement, corporate affairs, legal and finance. We note that the ESO has proposed a 1% annual efficiency saving on these costs.

Benchmarking: we note that the ESO has carried out some external benchmarking with other system operators worldwide as well as specific activity benchmarking, including Gartner assessments of IT costs. We are unconvinced that the benchmarking is sufficiently comparable and that the Gartner cost assessment provides sufficient confidence that the ESO costs are either efficient or represent reliable forecasts. We note that IT costs in the ESO plan are stated as being £817m.

Uncertainties: we think the ESO faces considerable uncertainty in delivering new systems to time, quality and cost. While we recognise that risks have been identified, we are concerned that the impacts and mitigating actions are sufficiently well developed. However, we note that the regulatory regime is designed such that rolling two year plans are agreed which should help to ensure effective oversight by Ofgem and industry participants.

Sensitivities: the ESO also modelled our requested Totex sensitivity where the average ESO expenditure was kept at £173m for RIIO-2. This was done by capping any additional spending to £48m i.e. removing much of the £60m transformation expenditure, which would mean that the proposed £2 billion of consumer benefits could not be achieved. The ESO stated that underinvestment in IT now would risk that it would not be able to operate a safe and reliable system; also that some of this expenditure was needed for IT asset replacement, which would need to be refreshed anyway.

6.10.1. Cost summary

The expenditure programme proposed by ESO contains a large number of IT projects – an area with high risk. Many of these projects are currently only at design

stage. It is therefore particularly important that the capital programme delivery is subject to clear governance and checks and balances particularly given it is a cost pass through regime. The 2-year Business Plan reviews should also provide oversight over programme delivery.

Over successive iterations of its business plan the ESO has, as we recommended, provided greater clarity about the important role of the design authority, to bring key sector players together. It has also enhanced its proposed IT leadership and shown awareness of the commercial and cultural aspects of IT delivery. However, while the ESO has expanded on its relationship with National Grid Group – both on IT and as its procurement service, we remain concerned about its dominant position. The creation of an intelligent client function to sit opposite National Grid Group is welcome, but will not of itself ensure delivery, particularly against other group priorities.

Overall, we are concerned that the ESO does not fully appreciate the challenge of running this size of IT programme, and this number of projects, alongside its system operation role, and with the high level of dependency on National Grid Group. Significant weakness and lack of clarity remain about the precise governance of projects and their dependencies.

The use of benchmarking and independent assessment is helpful, but alone is not sufficient to give assurance; we are still concerned that allowance for contingencies is too low. We don't think the two-year planning cycle will be sufficient on its own to avoid significant cost overrun/scope creep – an issue given the extensive use of agile methods rather than fixed cost procurement.

The ESO should be financially incentivised by Ofgem through its performance regime to deliver agreed initiatives to time, cost and quality. We are concerned that the potential high returns available to the ESO may incentivise it to grow its own asset base and enhance returns of its parent rather than seeking optimum delivery solutions, including the use of third parties for delivery.

6.10.2. Cost Benefit Assessments

In our feedback comments to the ESO on draft plans, we highlighted that, while the CBAs take account of some potential uncertainties and risks around market, third-party and delivery factors, they are very high level and, although some different options are assessed, the key assumptions behind these calculations are not well justified.

In the December plan, the ESO sets out its CBA assumptions in the 148 pages of Annex 2 to the Business Plan. Between the October and December submissions, some additional detail has been provided, but, in the main, the changes have been to reduce the forecast benefits in Years 1 and 2 of the RIIO-2 period, while generally maintaining the forecast for the later years. This has the effect of lowering the overall 5-year NPV for the 11 CBAs from £2002m to £1967m.

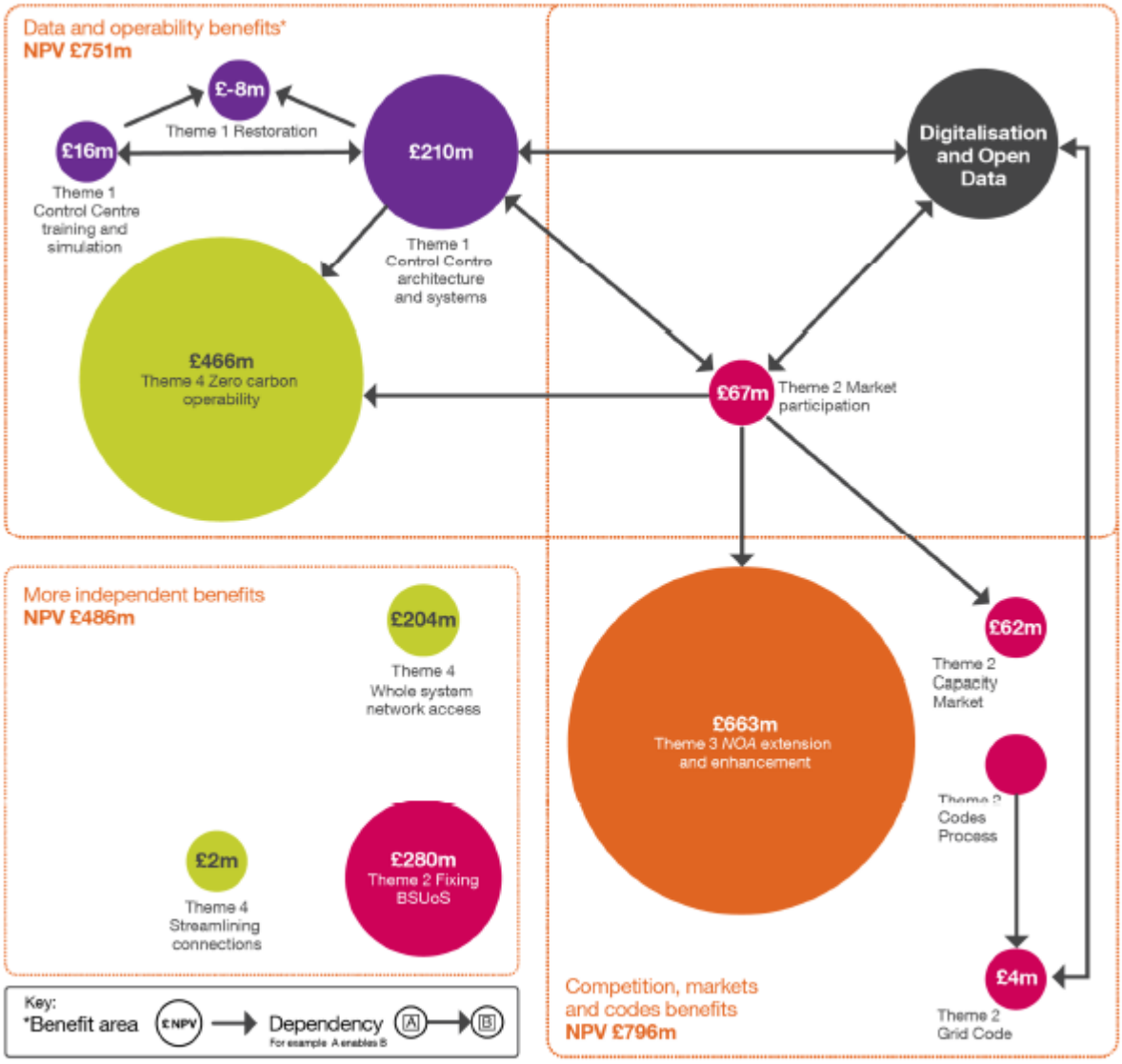


Figure 3: Benefits dependency map. (NPV = net present value.)

Taking each area in turn, we have considered the benefits claimed for the RIIO-T2 period only.

Control centre architecture (£153m) - The investment in the Control Centre architecture and systems of £153.2m is justified against six benefits totalling £305m, with a combined range of £108m to £606m, as follows:

- Reduced CO_2 emissions £51m (£3m-£101m)
- Greater interconnection £12m (£4m-£48m)
- Utilising flexible technology £109m (£46m-£152m)
- Better inertia forecasting and needs management £ 16m (£8m-£23m)
- Improved situational awareness £117m (£46m-£281m)
- Reduced balancing mechanism outage downtime £1m (£0.6m-£1.3m)

We believe there is a case for supporting this investment, as it underpins the capability of the ESO, and the benefits are in credible areas, even if the numbers are somewhat speculative. We are concerned that the costs may be higher than necessary and that there is significant delivery risk. We suggest Ofgem conducts a review of the costs, delivery approach, and risk mitigation programme.

- **Control Centre Training and Simulation (£22m)** – this spend of £21.7m is justified against three benefits totalling £35m, with a combined range of £15m to £64m, as follows:
- Reduced resource costs £5m (single estimate)
- Decreased training costs £ 2m (£1m-£3m)
- Improved decision making £28m (£9m-£56m)

The case for this investment hangs on it leading to improved operational decision making, so we suggest that Ofgem seeks more evidence for the associated assumptions.

Restoration (£34m) - Black Start from Distributed Energy Resources (NIC Project) spend of £34m is justified against the cumulative project NPV to 2050 of £115m, although it has a negative NPV of £8m during the RIIO-T2 period. Again, we are concerned that the costs may be too high.

Future balancing and wholesale markets (£37m) - the spend of £37m to build the future balancing service and wholesale markets, enabling a reduction in the market participant size to 1MW, is justified against two benefits totalling £106m, with a combined range of £35m to £159m, as follows:

- More liquid response and reserve market £77m (£26m-£116m)
- Buying the optimal volume of response £29m (£10m-£43m)

It is unclear how robust the assumptions are on the increase in market liquidity through lowering the participant size to 1MW, and whether it is based on a market design that is sufficiently well developed to optimise growing flexibility costs over the next decade and beyond. We suggest further assessment is carried out before commencement to ensure that this investment does not itself lead to new market barriers.

Access to capacity markets (£9m) - the spend of £9m to transform access to the capacity market is justified against two benefits totalling £74m, with a combined range of £29m to £112m, as follows:

- Enhanced modelling capability £68m (£26m-£103m)
- Reduced barriers to entry and cost of participation £ 6m (£3m-£9m)

Provided the low end-range assumptions are robust, the case for this investment appears to be made. We therefore suggest stress-testing the low-end assumptions.

Digital Grid Code (£6m): the spend of £6m to create a fully digitalised, whole system Grid Code by 2025 is justified against reducing barriers to entry with benefit of £10m, and a range of £3m to £15m. Given the relatively low level of benefit during RIIO-T2, compared to the cost, and the potential need for extensive engagement and resource input from across the Industry, we suggest that the reported stakeholder appetite is clearly demonstrated prior to commencement.

BSUoS charges: the ESO proposes to "Look at fully or partially fixing one or more components of BSUoS charges", citing benefits during the RIIO-T2 period of £324m, with a range of £243m to £804m. ESO does not seek specific incremental allowances to carry out the activity, but envisages additional working capital and bad debt funding costs, due to different BSUoS collection arrangements. These are estimated at £19m with a range of £9m to £30m. We have not considered the various impacts from changes to BSUoS, but support reforms that are in the long term interests of customers, not simply to have additional risk passed to the ESO that will be backed by consumers.

NOA (£18m): the proposal to extend the scope of the NOA process, at a cost of £18m, to include end of life asset replacement decisions, all connections wider works, and support for decision making at the distribution level is claimed to have total benefits of £725m, with a range of £521m to £987m. While the benefits appear huge, compared to the cost, we question whether the development of the NOA process fully addresses the challenges of optimising network and flexibility planning at both transmission and distribution levels. We think the NOA process should focus on enabling fair competition in providing solutions, be that by TOs DNOs or providers of flexibility services.

Connections (£6m): the spend of £6.4m to take a whole electricity systems approach to connections has a total benefit of £8.1m, with a range of £4m to £9m. Given the relative scale of the costs compared to the benefits, we suggest the numbers are challenged to test their robustness.

Whole energy system approach (£77m): the spend of £77m to take a whole energy system approach to promote zero carbon operability is justified against two benefits totalling £548m, with a range of £397m to £697m, as follows:

- Whole system operability NOA-type assessment £503m (£377m-£596m)
- Regional Development Programmes (RDP) £ 45m (£20m - £101m)

While some of the output from the whole energy approach to promoting zero carbon operability may be an essential enabler of zero-carbon network operation in 2025, which we welcome, it is unclear whether the claimed financial benefit takes account of costs incurred by third parties, or the joint timescale that will be required to deliver the solutions. Ofgem should check this.

A break-even analysis has also been provided for the development of a regime for an integrated offshore grid, which would form part of this work programme. This would appear to be important, given the increasing role of off-shore wind generation. However, this should build on the benefits realised by the OFTO regime where third parties have been able to deliver successfully and operate networks at lower cost than onshore TOs.

Network access planning (£8m): spend of £8m on improved network access planning is justified on a forecast benefit of £224m, with a range of £112m to £338m. The benefits, if true, would more than outweigh the costs, but we question their robustness and whether the £8m cost is genuinely incremental.

Other CBAs: "Break-even" analyses are presented for five proposals:

- Designing the markets of the future: the cost of £4.1m covers 2023/24-2025/26, which is after £18.3m has already been incurred on projects such as

"building the future balancing service and wholesale markets". This programme of work may be too late.

- Transforming the process to amend Industry codes: the cost of £7.8m is material and we would like to see clarity around whether or not there is a stakeholder consensus for the ESO's proposals.
- Review of the Security and Quality of Supply Standard (SQSS): provided the stakeholder support exists, the potential benefit is high compared to the spend of £1m.
- Leading the debate: it is unclear from Annex 2 whether the ESO intends to seek to make policy recommendations or not (Option 3). This should be clarified.
- Digitalisation and Open Data, costing £12m, citing McKinsey estimates of the global value of open data, and benefits to the Economy from Transport for London open data: provided the costs are efficient and the scope of works is properly defined, we agree with the digitalisation goal, and recognise the difficulty in deriving a deterministic CBA.

6.11. Overall comments on CBA

The benefits analyses are based on high-level assumptions that are hard to verify deterministically. While the ESO has made a reasonable attempt to seek touchpoints on which to base a central case and sensitivities, we consider many of the assumptions to be quite poorly justified. In particular, the benefits claimed from better decision-making appear to be based on the key (and perhaps outdated in a world of growing distributed energy) premise that centralised decision-making is inherently better for power systems than distributed decision-making.

We do not think, for example, that the case for extending the scope of the NOA process is well made, nor do we believe that a wide enough range of options has been considered in the ESO's approach to whole systems.

We are concerned that the CBAs take "do-nothing" or "continue incremental development" as the counterfactual. We suggest they should consider a more "open-system" approach to decision-making involving competition and third parties, where the ESO's role is to pose the right questions, provide expert advice and information, and to provide access to open and accurate data in pursuit of the best market response. This seems like a lost opportunity, especially given the ESO's proposal for Digitalisation and Open Data, and its recognition of the economic benefits delivered by third parties in open data environments.

6.12. Finance

We have evaluated the financeability section of the ESO's plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement both with appropriately qualified consumers and with our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem's WAs.

The October plan was largely compliant with Ofgem's Business Plan Guidance in that both the Notional and the Actual Company had been modelled using Ofgem's WAs and a reasonable set of sensitivities presented. Some emphasis had been placed on a non-compliant proposal which was appropriately distinguished from the cases required by Ofgem and which was said to be required to achieve financeability. This case was based on a substantial premium over Ofgem's WAs (Cost of Equity allowance of 9.36% versus Ofgem's 7.81% and Cost of Debt allowance of 67 bps versus 25 bps). Our November feedback made clear that we did not consider Cost of Capital allowances needed to be set as high as that to ensure financeability.

There were issues outstanding with Ofgem as to the most appropriate structure for debt financing the ESO plan, particularly in relation to the required working capital facility, and we accepted that this gave rise to some uncertainty as to the ratings the agencies would eventually apply. However we did not consider that that warranted either such a large premium over Ofgem's proposed Cost of Capital allowances or the assertion that neither the Notional nor the Actual Company was financeable on the basis of Ofgem's WAs. Measures to increase financeability other than an increase in Cost of Capital allowances and additional revenue were rejected. There was evidence of consultation with stakeholders in relation to financing generally but not, either with consumers or the wider stakeholder group, on specific financing issues and the trade-offs that those imply.

The December plan evidenced some engagement with our November commentary in that the full sensitivity analysis was presented and, to some extent, analysed and the company accepted Ofgem's WAs for a 7.81% Cost of Equity allowance and 55% gearing. It had modelled on the basis of the Ofgem WA of a Cost of Debt allowance of 25 bps while making clear that it considered the Cost of Debt allowance needed to be increased to take account of a number of factors, including 10bps issuance costs and, in our view unaccountably, a further 25 bps for a so-called 'Notional Company Adjustment' to reflect the fact that the ESO is to be a stand alone company.

Both the Notional and the Actual Company were said to be financeable, in terms of their ability to raise debt, on the basis of Ofgem's WAs, without the need for mitigation measures. However the plan draws a distinction between the term 'financeable' and the ability to raise equity and the company makes clear that it does not consider that it will be viable overall without revenues additional to the Cost of Capital allowances (we note that, at 7.81%, Ofgem's WA for the Cost of Equity allowance is over 50% higher than that proposed for the network companies).

Apart from small scale and short term adjustment to the capitalisation rate, the ESO effectively rejects all mitigating measures apart from additional revenues. It presents a variety of arguments for these additional revenues which give rise to a requirement for an annual payment of between £13 and £39 million. However calculated, we do not accept that a convincing case has been made that additional revenue, even at the £13 million level, would be good value for the consumer.

We accept that some of the issues in relation to the debt financing of the ESO plan are still outstanding with Ofgem and that the eventual decision as to where the TNUoS collection responsibility should lie will affect the risk profile of the ESO and hence the rating it will be accorded by the rating agencies. However we consider that it takes an unnecessarily negative view both of the rating it is likely to achieve (it

appears to expect very little recognition of the positive impact of the combination of the Totex pass through arrangements and the two year review period) and of the ratios it will need to achieve in order to be accorded an appropriate rating. It is, for example and unnecessarily in our view, targeting a minimum AICR of 1.8x, a 5% dividend yield, dividend cover of 1.5x and an EBIT margin of 10%. We do not consider that it presented sufficient evidence that, even if the TNUoS collection risk were to remain with the ESO, the rating agencies would assess the potential cash flow volatility and other risks as so high as to warrant ratios of that order of magnitude to support an investment grade rating.

There is evidence that the company has consulted stakeholders in relation to its plan as a whole but, as in October, there appears to have been no detailed engagement in relation to specific financing issues and related trade-offs. There was virtually no evidence of engagement with consumers (as distinct from other stakeholders) and certainly no indication of consumer support for additional revenues of ‘at least £13 million per annum’.

In summary, the ESO’s Plan is financeable on both a Notional and an Actual basis without mitigating actions. However the approach it considers will be taken by equity investors is not, in our view, sufficient to justify a requirement for revenues additional to those yielded by the 7.81% Cost of Equity WA (which, as noted above, is itself more than 50% higher than that proposed for the network companies).

7. Company Report - National Grid Electricity Transmission (NGET)

7.1. Summary

The following table sets out our rating for the NGET final December Plan, together with the average scores we have given NGET during their plan preparation stages.

NGET Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms	n/a	
Outputs: vulnerable consumers	n/a	n/a	Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings - we gave RAG ratings to the companies as part of our feedback after receiving their October plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to red where we thought it was weak or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December plan ratings – our RAG ratings on their final December plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the Plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is weaker and the company proposals are not acceptable. Our explanatory comments are provided in this report.

7.2. Plan highlights

- **Costs** - NGET expect to underspend their RIIO-1 plan by £2.53 billion (20%). They are seeking an overall Totex increase of 10% from RIIO-1 to RIIO-2, to an average of £1421m p.a. driven largely by a 40% increase in asset replacement expenditure. NGET are also proposing sector and bespoke uncertainty mechanisms for a potential further £3 billion of costs over RIIO-2. NGET's overall efficiency increase appears to be less than 1% p.a.
- **Outputs** – All output targets for RIIO-1 are being met or exceeded. For RIIO-2, in addition to sector outputs, NGET are proposing 20 bespoke outputs with some funding included in Totex baseline.
- **Financing** – NGET does not consider that its Plan is financeable using Ofgem's Cost of Capital WAs without mitigating actions.

7.3. Track record

Ofgem's Business Plan Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs – NGET expect to meet or exceed all output targets set for them during RIIO-1.

RIIO-1 Totex – we have sought to assess why expenditure has differed from allowances set at the outset of RIIO-1 and how the causes have been reflected in the RIIO-2 Business Plans. Overall, the evidence provided is broad brush about the efficiency gains that have been realised and it is difficult to verify where outperformance is genuine rather than due to poor forecasting or overly generous allowances.

For RIIO-1, Totex spend is £2.53bn (20%) below allowances, as adjusted down by load related volume drivers (£1.94bn) and NGET's voluntary deferral (£0.64bn), and up by an allowance for specific projects during the period. It does not appear that this is all due to NGET outperformance.

Load-related spend on Connections and Boundary Capacity is forecast to be £0.77bn below adjusted allowances, with substantial variances between categories, suggesting that part of the underspend is attributable to weak design of the volume drivers in the associated Uncertainty Mechanisms (UM) rather than NGET outperformance. NGET propose significant changes to the UMs for RIIO-2, which appears necessary.

Non-load related spend is forecast to be £1.3bn below the adjusted allowances, which NGET apportions as £1044m to efficiency, £183m to customer-driven interactions, and £62m to the RIIO framework. NGET's explanation of the £1044m of NLR outperformance is Life Extension (£719m) and reduced unit cost of Interventions (£407m), offset by additional costs (£100m).

NGET's supporting analysis[18] shows slightly different (higher) numbers for savings in RIIO-1 and describes how these lead to savings in the RIIO-2 Plan. This is high level and hard to verify. NGET say that some of the investments related to the £0.6bn of voluntary deferrals in RIIO-1 are now included in the RIIO-2 Plan and they expect Ofgem to take into account the voluntary deferrals in their assessment.

For RIIO-1, 47% of the underspend will be retained by NGET and 53% returned to customers. NGET say that savings of some £1.1bn will be reflected in the baseline RIIO-2 plan. This is again hard to verify.

RIIO-1 Returns – NGET state that they have earned a return on regulatory equity of 10.5% adjusted for Retail Price Index.

7.4. Business Plan commitment and assurance

The main body of NGET's Plan contains a Board Assurance Statement, signed by all board members and supported by a detailed annex. The assurance statement contains a clear statement that the board 'owns' the overall strategy and direction of the company's Plan and it addresses accuracy, robustness and efficiency, ambition,

[18] Annex A9.04 T1-T2 Interactions

value for money and stakeholder engagement. Financeability is not covered (though it is addressed in the annex). The wording of the assurance in relation to financeability has clearly been carefully chosen and the assurance is, in its effect, heavily caveated: although it opens with the statement that 'The Board provides the required assurance that, in its opinion, the Company's Business Plan is financeable', the caveats, which include rejection of Ofgem's proposed 0.5% outperformance assumption and changes to the capitalisation rate to improve financeability, are substantial and there is an explicit statement that the board 'is not agreeing to the financial framework and the working assumptions proposed by Ofgem'.

The statement in relation to governance is of good quality. There is a reference to compliance with the UK Corporate Governance Code and a detailed exposition both of the risk assessment process which underlines the governance arrangements for the development of the Plan and of those arrangements themselves. Governance is based on a 'three lines of defence' system. All three elements are internal but the overall arrangements have been subject to review by EY. EY's brief appears to have been wide-ranging but there is little other external endorsement except in relation to triangulation of the stakeholder engagement (principally Frontier Economics and Truth). A sample of JRs and CBAs has also been reviewed by external parties.

The Plan provides a good level of detail on the Company's short-term bonus plans which it says 'incentivise the delivery of financial, strategic and operational measures'. It gives detail of the weighting from which it is clear that the scheme provides for reasonable alignment with Plan outputs. There is less detail on LTIP arrangements but there is a statement that they 'take account of our financial, strategic and operational priorities.

7.5. Stakeholder engagement

The engagement to develop the Plan is acceptable, it is clear at an overarching and issue-by-issue level how engagement has influenced the Plan and trade-offs are discussed. NGET acknowledges that it has further to go to embed a genuinely customer and consumer-centric culture throughout the business and we welcome the news in the December Plan that Board members have signed up to an engagement 'charter' which commits them to various actions including: tracking key stakeholder performance metrics, being actively involved in stakeholder engagement and assuring that engagement is embedded across the business. This commitment to action from the top could prove an effective way to accelerate the embedding of both a stronger culture of engagement and a more effective customer focus.

The future strategy is good. It includes a commitment to ongoing research with consumers using a range of methods, and makes strong commitments around the ongoing use of the User Group, including allowing the group freedom to define how it should most effectively hold NGET to account for delivering its promises to stakeholders, and to define how best to both measure and report on the ongoing impact of engagement.

In terms of acceptability, NGET says that 87% of 'household and business customers combined' agreed that the Plan was acceptable. However, it adds that, for household consumers, this is 'conditional on limited increases in other components of their overall energy bill', and that 'NG proposals would not be acceptable if all parts of the energy bill were to increase by similar proportions'. We suggest that Ofgem explore this qualified consumer response with NGET at the Open Hearings

as well as exploring the extent to which acceptability testing with consumers in future could take account of the total impact of energy costs on consumers' bills.

The costs of 'enhanced engagement' are given as £750k per annum and the Plan confirms that these are in the baseline. This covers the salary of a central team, the User Group, additional engagement and research studies including the use of expert agencies where required. However, it makes clear that this does not include the cost of 'BAU engagement' which it estimates at £3.7m per annum in 2018/19. It says this is comparable with the £4.8m investment made in engagement by top-scoring electricity distribution company WPD. However, we note that, while the costs are similar, NGET's performance lags significantly behind WPD's according to Ofgem's Stakeholder Engagement Incentive review panel.

There is one bespoke incentive proposed in this area which is a reputational incentive to 'encourage and improve the quality of our engagement with our customers'. As with other companies, this is an essential activity but we do not believe it represents more than should be expected as business as usual in RIIO-2.

7.6. Outputs

NGET has provided 20 bespoke outputs in addition to those required by the sector methodology. Eleven of these are identified as price control deliverables, six are ODI-F and three are licence obligations. Funding for certain outputs is included in baseline Totex totalling £2 billion. However other outputs are identified as uncertainty mechanisms as described below.

These are significant costs and result in a large Totex increase. We have concerns that these cost estimates and proposed output targets will not provide value for money and recommend that they should be investigated further.

7.6.1. Customer outputs

In terms of customer satisfaction, the Plan talks about a 'vision to exceed customers' expectations' which will be evidenced by customers saying they feel 'treated like a partner'. These are encouraging and laudable aims and the overall customer experience strategy is good. However, there is relatively little detail on how this vision will be delivered other than by meeting the connections targets set out in the standards and through the delivery of a £10m CRM system and self-service functionality. It is difficult to see how these initiatives alone will enable NGET to respond to the wide range of customer service improvements that its engagement shows stakeholders want. It says that customer service targets will be set once the new survey pilot is complete. It is disappointing that NGET was not prepared to volunteer a proactive stretch target despite having clearly done a significant amount of work in this area, including key driver analysis in order to build its customer service principles.

The options analysis on the CRM investment was also disappointing given that the other options considered are simply 'do nothing' or 'defer investment to RIIO-3'. This does not indicate that alternative ways to meet stakeholders' service needs have been explored in any depth.

For the Energy Not Supplied incentive, NGET proposes a target of 175MWh. This represents a 45% tightening compared with the RIIO-1 target of 316MWh. However, as with all the electricity TOs, that needs to be set in the context of the RIIO-1 actual

annual average which for NGET is about 35MWh. We suggest that Ofgem carries out a more detailed cross-company comparison of targets in this area to ensure that they are appropriate and equally stretching.

There are a number of bespoke outputs in this area. These include a reward-only financial incentive worth up to 1% of revenue for 'accelerating low-carbon connections'. NGET say that this 'incentivises us to deliver connections with shorter lead times where customers want them and where it reduces carbon emissions'. It claims to have 'strong stakeholder support' in general for providing a better connection service and for reducing greenhouse gas emissions. However, we were not clear what level of stakeholder support there is for this specific initiative, rewarded in the way and at the level proposed.

NGET also proposes that, if Ofgem decides not to include customers who experience outages in the customer satisfaction survey, it will propose a bespoke symmetrical financial incentive in this area worth +/- 0.4% of revenue. It says that the customer satisfaction targets here would be 7.7/10 in 21/22 rising to 7.9 in 2025. Given that its latest score is already 7.7/10 and other TOs' recent scores are 7.9 and 8.7/10, we do not think these targets are stretching.

7.6.2. Maintaining a Safe and Resilient Network outputs

From a costs perspective, the outputs most closely linked to NGET's proposed expenditure are the Resilience ones in respect of NLRE, and those covering the Connections process, Boundary Capability, Network Reinforcement and Whole System for LRE. NGET have provided evidence of its efforts to consult on, and socialise the output proposals with stakeholders, including the User Group.

We discuss the resilience outputs in more detail below.

For LRE, the proposed LOs and ODIs are appropriate for Connections and the Connections Process. However, as we comment elsewhere, it is essential that the associated UMs are correctly set, in order to assure customers of value for money. For network reinforcement and increases to boundary capability, the same comments apply.

Asset resilience - The key resilience outputs to be delivered by proposed investments of respectively £2.25bn and £0.96bn are a quantified NARM output for lead assets, and volume PCDs for non-lead assets. NGET point to evidence that stakeholders wish to see network risk levels maintained broadly where they are today.

Based on NGET's NARM data, without intervention, risk levels would increase over the RIIO-2 period by r£487m, from r£1052m to r£1539m. The Plan proposes interventions on lead assets to offset the increase by r£527m, resulting in an end-of-period NARM of r£1012m. For non-lead assets, the volume of interventions would be measured though a volume PCD. Given the relative newness of the NARM process, and the difficulties in data verification, it is important that Ofgem works with the company to confirm the robustness of those projections and is able to track physical changes in the Business Plan over the RIIO-2 period. Having volume based PCDs should provide some reassurance to customers.

In addition and independently of our view of the proposed expenditure levels, it is important that customers are protected by robust setting of the other safety and

resilience outputs, listed below, which NGET propose to deliver for a total investment of £0.58bn:

- Network Access Policy and Safety compliance (LO) – to report on Safety and NAP.
- Successful delivery of large capital investment (PCD)
- Energy Not Supplied (ODI) (Indicative Target 175MWh, collar of 3% of revenue)
- Investment in protection and control coordination study, costing £31m. (PCD)
- Extreme Weather, including flood mitigation, costing £60m (PCD)
- Physical Security, costing £45m (PCD)
- Cyber Security, costing £184m (PCD)
- Telecommunications Infrastructure Refurbishment, costing £241m (PCD)
- Black Start Capability, costing £22m (PCD)

NGET proposes a total investment of £0.58bn for the above. We support the proposed outputs, but question a number of instances where we believe the proposed costs are too high or potentially duplicate other expenditure elsewhere in the Plan.

We also support NGET's proposed PCD, to install Wide Area Network monitoring under "Meeting the Needs of Consumer and Network Users", but suggest that Ofgem review the cost of £48m, and the delivery programme, to ensure that this output is delivered efficiently, to support the ESO in maintaining a safe and resilient network, at a time when the whole system is transitioning rapidly.

Lastly, NGET are seeking £30m for the Deeside Centre, which we believe should be challenged on the basis of value for money and alternative funding sources, such as third parties and the Totex incentive mechanism.

Workforce Planning – NGET have provided a reasonable people plan, addressing the main issues facing the sector and NGET.

Cyber Resilience – NGET have forecast high levels of investment for IT and cyber security. Due to confidentiality requirements, we have been unable to review this evidence and rely on Ofgem to examine these costs and the resilience provided.

7.6.3. Environment Outputs

There has been a definite improvement to the Plan and the EAP over the three drafts which they presented to us. A number of the points made by us have been taken on board, and we feel that engagement in this area has been genuine.

The Plan shows some real depth of analysis and ambition in relation to SF6 – where the Plan has developed markedly from previous drafts - and biodiversity/natural capital enhancement. The methodology and attempts to benchmark are welcome. The targets for carbon reduction are clear and ambitious (particularly in relation to capital carbon from construction) and the addition of a 50% target for scope 1 and 2 carbon reductions by 2030 is welcome. There is some good evidence in the Plan of stakeholder engagement to shape plans and targets. The optioneering summary in the EAP, which we considered to have been simplistic in October, has improved significantly in the December Plan.

Our key reservation in this area relates to cost. NGET propose a number of environmental outputs that would require significant investment to deliver. The most costly, for which NGET propose in-period determinations, are for Visual Impact (ca. £200m, already included in baseline), Urban Improvement Provision (£50m), and Investment for SF6 reduction (>£150m). For SF6 reduction, we are unclear how this relates to NGETs asset replacement scope and cost proposals. We recognise that there is some evidence of stakeholder support for those programmes, but would urge Ofgem to take full account of the cumulative impact on bills and decarbonisation benefits when considering the programmes, both individually and in the round.

NGET seek baseline allowances for other outputs, including £47.5m for replacing operational vehicles with alternative fuel (electric) vehicles (£36.05m vehicles plus £11.44m charger network), Developing alternatives to SF6 (£2.5m), and Offsetting residual capital carbon (£2.5m). The level of costs has not been fully justified. In particular, displacing 499 internal combustion engine (ICE) vehicles with EVs adds £16.9m (£47.5m vs £30.5m) to the operational vehicles replacement programme. £11.4m of this increased cost appears to be attributed to installing 234 charging points which seems high.

We think it is important, therefore, so far as all the other outputs listed on the Environmental Outputs Scorecard go, for Ofgem to confirm that NGET propose to deliver them in the normal course of implementing their investment and operating cost budgets, and have not included any additional funding requests.

7.6.4. Bespoke ODIs

NGET are proposing a single environmental financial ODI which is an incentive linked to their environmental scorecard, covering 7 targets within the EAP. This is a penalty and reward mechanism, with a maximum annual reward of £4m. Although the amount is relatively modest, given our concern about the cost of delivery of environmental commitments noted above and that other companies are not expecting to be incentivised to deliver the sort of environmental benefits their stakeholders support we do not see the justification for this ODI.

7.7. Towards Net Zero/Whole system

On the longer term transition to net zero, we welcome that the Plan has a net zero aspiration for scope 1 and 2 reductions by 2050 and that it includes at least a vision for a whole system approach in facilitating a cost effective transition to a lower carbon energy system which discusses some of the key issues at a high level. We note that NGET have presented some detailed proposals going beyond the RIIO-2 period:

- East coast networks to support offshore wind development;
- Network investment to support EV charging; and
- Harmonic management.

However, the net zero discussion and proposals are very electricity centric - there is scope for more work with other sectors and players, and the specific proposals are essentially focused on the important, but quite narrow, aim of increasing system capacity. There is no discussion of network topology and relatively little on new technologies.

The Plan proposes 8 specific whole-system cases and provides a positive business case for these propositions. These are welcome (although – as noted above - very electricity system related - no interaction with gas has been considered). NGET propose to invest significantly in innovation projects related to the whole-system paradigm.

7.8. Digitalisation plans

NGET provided an initial digital plan in October. We commented that the Plan outlined a reasonable set of transformational initiatives both on the network (WAN monitoring) and “Big Data” IT transformation. It had a well-reasoned action plan and IT expenditure forecast, including benchmarking information, although the three-year IT replacement cycle seemed high. We thought the digitalisation plan still needed further development, to demonstrate how it would benefit consumers.

The December Plan is high quality and well-reasoned. It takes a holistic view, albeit a little "electricity only" in scope. It addresses business as usual and the potential for a step change in improvement. There is a well-articulated level of ambition, addressing customer usability and next step priorities.

The justification for "Front office digital & innovation spend" appears good, with evidence of expenditure to date and a diagnosis of the current state. The breakdown of cost drivers and future versus current state is weaker for "Corp & Biz services" and "Infrastructure". We would wish to see a clear breakdown and justification for all IT spend to differentiate between business as usual, cyber and additional digitalisation plans.

We welcome the inclusion of subscription based models including Software as a Service (SaaS) for third party technology innovations, plus ambition focusing on greater collaboration and data exploitation. We also welcome the movement since our October feedback to NGET being positioned more as a partner rather than leading and controlling data.

Overall, the Plan provides confidence about delivery, addressing matters such as people, organisation, creating an end-user culture, together with transparency and accountability.

7.9. Managing uncertainty

NGET have provided considerable detail, and some evidence of in-principle stakeholder support for 21 proposed uncertainty mechanisms, which take the form of in-period determinations (reopeners) and volume drivers. The volume driver UMs, which mainly cover load-related expenditures were quantified in the December submission, and NGET say their additional complexity improves their cost reflectivity.

Of the six volume driven UMs, the four largest are designed to adjust NGET’s allowances automatically in the areas set out in Table 1 below.

Table 1: Uncertainty mechanisms designed to adjust NGET's allowances automatically

Volume driven uncertainty mechanism	Baseline	Range (90% Confidence Limits)
Generation Connections	£216m	£178m to £455m
Demand-related Infrastructure	£89m	£54m to £204m
Boundary Capacity Upgrades	£507m	£497 to £1038m
Facilitating Competition (Pre-consents Work)	£182m	£0 to £300m

We note that the UMs listed above could double the outturn allowances compared to baseline, and therefore the importance of ensuring that benchmark costs and the formulae used to set them are robust. We suggest that Ofgem seek independent validation of the new and revised drivers, in particular to test them for fairness in apportioning risk between NGET and customers. NGET are also proposing to work with Ofgem to establish a "whole system" automatic adjustment mechanism, and we would again suggest independent validation of any proposal. The remaining 14 UMs proposed by NGET would take the form of in-period determinations. We note that a trade-off, between regulatory workload and benefit to customers, will have to be made in any decision to take those uncertainty mechanisms forward into the price control settlement.

We have concerns about a number of NGET's uncertainty mechanisms. These include:

- Facilitating competition, where NGET are estimating more than £300m may be required to obtain consents on contestable projects. This is in addition to £36m p a. that NGET have identified in its Totex baseline for such work. We note that NGET's Plan identifies four projects for late competition.
- Ensuring a resilient electricity network, which says that additional expenditure may be required from industry code/standard changes.
- Protection and control investments.
- Environmental mechanisms including SF6, Urban impact, visual impact.
- System operability including voltage equipment and substation rebuilds.

In most cases, it is unclear what expenditure is already in the baseline and whether these risks have already been included as risk factors in the baseline, thereby resulting in potential duplication of some of these costs. For example, significant increases have already been included in baseline NGET Totex for protection and control replacement, which we address later in this report.

In addition to our concerns about whether some of these mechanisms are necessary, we are concerned about their complexity. Importantly, most of the proposed UMs did not have corresponding mechanisms in RIIO-1, and their introduction is likely to result in lower levels of uncontrollable risk resting with NGET.

Where NGET's new proposals are taken forward, we would expect that they will feed into an overall calibration of risk/reward within the price control settlement.

On RPEs NGET have proposed an increase above CPIH of around 0.9% pa. Many of the costs that NGET have proposed, e.g. workforce costs are under their control and should not be included, and residual cost drivers are likely to fall below a materiality threshold. We do not think these costs should be included in RPE indexation.

7.10. Efficiency – innovation and competition

Innovation - A large number of initiatives are proposed for NIA funding and £76m of NIA innovation funding is anticipated, plus 10% of their own contribution. A total of £27m is identified as BAU in the baseline Plan. We think the amount allocated to BAU innovation is low and consider that some of the NIA initiatives could also be BAU. The Plan does not fully explain or forecast how innovation will benefit consumers in RIIO-2 and beyond.

Competition - The Business Plan describes NGET's approach to native competition and projects for late competition over £100m, for early competition over £50m. Three early competition projects are identified and 4 projects are identified as late competition projects. None are in the baseline plan. Given the scale of investment proposed across the entire NGET Plan, more projects would be expected to be identified, providing evidence why they are suitable or not suitable for competition. We think that NGET could have been more proactive and identified projects suitable for competition that fell below the Ofgem criteria. Generator connection sole works could have been considered for competition for example.

Efficiency saving – the Plan claims total efficiencies in two categories. The first is £707m simply from taking forward policies developed during T1 into the T2 Plan covering asset life extension, targeted replacement, and steelwork recovery. The second is £383m, described as "future efficiencies", and on which we have focused. These include savings from re-basing costs at the start of the T2 period, of £200m from the current UK Efficiency Programme plus £29m from a process to benchmark support costs. The remaining on-going reductions to be made during T2, come to £154m, derived from a 1.1% p.a. efficiency of £84m applied to the element of the capital plan and operating costs relating to National Grid employees, a unit cost efficiency initiative of £43m to bring unit capital costs to no more than an industry average determined by TNEI, and savings of £27m from acceleration of engineering innovation.

It is difficult to ascertain exactly how these efficiencies have been fed into the Plan, but the future efficiency savings to be delivered during RIIO-T2 appear to be £154m, and represent less than a 1% year-on-year improvement. This is much lower than might be expected from a company that is claiming significant efficiency savings in RIIO-1.

7.11. Costs

7.11.1. Forecasting and scenarios

The NGET Plan has used the lower-case assumptions from the ENA Common scenario. It states that an additional 15.2 GW of new generation capacity will connect during the RIIO-2 period, incurring connection costs of some £255m. The Plan

provides for an additional 20.8GW of network capacity that is made available through network boundary investment of £507m, dependent on agreement through the ESO NOA process.

While the Plan appears to have used the common scenario, there is still considerable uncertainty about reinforcement, and generation/demand connections. The design of uncertainty mechanisms still needs to be completed so upwards and downwards adjustments to these uncertain baseline revenues may be realised.

7.11.2. Costs - the NGET Plan

Ofgem's Business Plan Guidance requires companies to justify costs, including cost drivers, consideration of options, and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

The NGET Plan proposes Totex expenditure of £7,104 million for the RIIO-2 period (excluding real price effects but including NIA) as shown below. This has reduced by around £300m from the £7.4 billion proposed by NGET in their July 2019 draft Plan.

Figure 14.5 Cost of delivering key stakeholder priorities

Key stakeholder priorities		T2 cost in £m		
	Capex	Opex	NIA	Total
1. We will enable the ongoing transition to the energy system of the future	933	3	0	936
2. We will make it easier for you to connect to and use our network	396	21	0	417
3. We will provide a safe and reliable network	3,523	764	0	4,287
4. We will protect the network from external threats	447	108	0	555
5. We will care for communities and the environment	232	23	0	255
6. We will be innovative	0	0	84	84
7. We will be transparent about our performance	1	0	0	1
Business Support	159	491	0	650
Additional capex efficiency commitments (not embedded in stakeholder priorities)	-81	0	0	-81
Total Baseline Plan Costs	5,610	1,410	84	7,104
Forecast of Real Price Effects, RPEs	271	54		325

In our feedback to NGET on their July and October draft Plans, we commented that we were concerned that their forecasts were unjustified and were higher than necessary. Given that NGET had significantly underspent its RIIO-1 price control allowance, we were concerned that asset replacement expenditure had simply been deferred to RIIO-2 to the benefit of shareholders. We also asked NGET to perform sensitivity analysis on certain elements of their Totex forecast.

NGET have claimed that £383m (about 5%) of future efficiency and £707m of past RIIO-1 efficiency is baked into this Plan. The future efficiency commitments for RIIO-2 are expected from protection upgrade innovation (£27m), UK efficiency programme benefits (£200m), productivity of people (£84m), aligning business support costs to benchmark (£29m) and moving Capex unit costs to be at or below a TNEI-estimated industry mean (£43m).

7.11.3. Our critique of NGET costs

We have not been able to use the cost breakdown from NGET's Plan as this is broken down into new categories without giving a clear reconciliation to past performance. Instead, we have used the key cost elements that are reported consistently by NGET to Ofgem over price control periods, which are set out in the

table below. This shows the same total as the breakdown of their expenditure shown above. We have compared the RIIO-1 average expenditures with the RIIO-2 forecast expenditures as shown below.

For changes between RIIO-1 and RIIO-2, the RAG ratings in Table 2 below highlight the range of highest increases (red) to highest reductions (green).

Table 2. RIIO-1 to RIIO-2 NGET Cost Comparison

NGET Price Control Costs (£m) Cost Category	RIIO-1 Average	RIIO-2 Average	RIIO-2 Total	% Change
Local Enabling (Entry)	70	36	181	-49%
Local Enabling (Exit)	28	15	75	-46%
Wider Works	258	138	688	-47%
LRE - sole-use Local Enabling (Exit - Sole Use)	10	9	44	-11%
LRE - sole-use Local Enabling (Entry - Sole Use)	2	5	25	105%
TSS Infrastructure	-	13	65	>100%
Total Load Related Costs	367	216	1,078	-41%
Replacement	330	397	1,986	20%
Refurb	25	113	564	346%
Non-Load Other	12	11	56	-8%
Total Non-Load Related Costs	367	521	2,607	42%
Non-Operational Capex	40	75	377	88%
Total Network Operating Costs	187	235	1,175	26%
Closely Associated Indirects (CAI)	200	210	1,051	5%
Business Support	95	92	458	-4%
Total Other Costs Within Price Control (Placeholder post May 2019)	35	69	347	100%
Total Costs within Price Control	1,292	1,421	7,104	10%

Highlights from this comparison are that load related expenditure (LRE) shows a 41% reduction but non load related expenditure (NLRE) has increased by 42%. There are also significant increases in non-operational Capex, network operating costs.

In seeking to understand NGET's justification for these expenditure items, we have struggled to understand the linkage between the expenditure categories and justifications set out in NGET's Plan and the Business Plan Data Templates submitted to Ofgem. For example, page 160 of the NGET Plan shows another breakdown of costs, with Opex totalling £1.4bn, and Capex totalling £5.7bn.

We have not sought to reconcile these different cost categories (which will be a matter for Ofgem's analysis) but have focused on the justifications for expenditure in the NGET Plan as detailed below.

7.11.4. NLRE

In assessing NLRE, we have focused on comparing NGET's cost and volume forecasts with current run rates for asset replacement. We have considered the engineering evidence for interventions, cost benchmarking and asset health information but expect Ofgem to undertake more detailed analysis in this area.

For RIIO-2 NLRE expenditure, while it does not reconcile with the Plan data submissions, we have used the NGET Commentary on their Business Plan Data Templates to evaluate the changes to expenditure and volumes by asset type that

have taken place between RIIO-1 and RIIO-2. These tables include capitalised indirect costs as well as direct costs so are not directly comparable with the overall cost comparison shown above.

7.11.5. NLRE cost comparison

The following table shows the expenditure changes between the actual average expenditure for the first five years of RIIO-1 compared to RIIO-2. For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Table 3. RIIO-1 to RIIO-2 NGET NLRE Cost Comparison

Funding Category £m	RIIO-1 Business Plan	RIIO-1 Actual & Forecast	RIIO-1 Actual & Forecast Average	RIIO-1 Actual Average	RIIO-2 Total Forecast	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change	RIIO-1 5yr actual to RIIO-2 change
	(8 yrs)	(8 yrs)	(8 yrs)	(5 yrs)	(5 yrs)	(5 yrs)	(%)	(£m)
Transformer	764	444	56	49	272	54	11%	5
Reactor	42	61	8	8	55	11	38%	3
Circuit Breaker	1335	952	119	112	402	80	-28%	-32
Cables	818	329	41	31	397	79	156%	48
OHL Conductor	578	532	67	80	624	125	56%	45
OHL Fittings	222	54	7	7	82	16	134%	9
Protection & Control	478	246	31	24	489	98	308%	74
Other TO	299	256	32	20	202	40	102%	20
Sub Other	447	248	31	15	187	37	149%	22
Cable Tunnels	460	346	43	47	414	83	76%	36
Black Start					20	4	>100%	4
Efficiency Saving					-44	-9	>100%	-9
Total	**5443**	**3468**	**434**	**393**	**3100**	**620**	**58%**	**227**

Table 3 above shows an overall increase of 58% above current expenditure levels, with an increase of £227m above the current run-rate of £393m p.a. in RIIO-1. Even after efficiency savings have been assumed, this would equate to additional expenditure of some £1.1 billion in total for RIIO-2 above the current RIIO-1 run rate.

Table 3 shows that the main increases have occurred on a) protection and control, b) cables and cable tunnels, c) overhead lines and fittings, and d) other expenditure.

Also, the 8 year (actual plus forecast) average is significantly higher than the 5 year actual average, indicating that NGET anticipate significantly accelerating asset replacement/refurbishment expenditure in the last years of RIIO-1. We would question whether this back-end profiling of RIIO-1 NLRE expenditure can be achieved and whether this is efficient.

7.11.6. NLRE Volume and unit cost comparison

Similarly, NGET's volume forecast for activities on key assets is shown in the table below, comparing average annual volumes for the categories that NGET have identified between RIIO-2 and the first 5 years of RIIO-1. Table 4 below shows a significant volume increase for overhead lines and fittings, protection and cables. Circuit breakers show a decreasing volume. The RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Table 4. RIIO-1 to RIIO-2 NGET NLRE Volume Comparison

Replacement Volumes (No. unless stated)	RIIO-1 Business Plan	RIIO-1 Actual & Forecast	RIIO-1 Actual & Forecast Average	RIIO-1 Actual Average	RIIO-2 Total Forecast	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change	RIIO-1 5yr actual to RIIO 2 change
	(8 yrs)	(8 yrs)	(8 yrs)	(5 yrs)	(5 yrs)	(5 yrs)	(%)	(£m)
Transformer	Redacted for commercial sensitivity						40%	
Reactor							20%	
Circuit Breaker							-62%	
Cables (km)							113%	
OHL Conductor (km)							72%	
OHL Fittings (km)							154%	
Protection (NICAP)							137%	
Protection (SCS)							-4%	

Based on data in the above tables, we have also compared actual unit costs in the first 5 years of RIIO-1 with the RIIO-2 forecasts. These are shown below in Table 5 for the categories that it has been possible to compare. The RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Based on this comparison, it would appear that unit costs are increasing for circuit breakers, cables and reactors, compared to RIIO-1 actuals. In particular, the circuit breaker costs have nearly doubled. These do not appear to demonstrate that efficiencies have been assumed and we would suggest these are explored further by Ofgem.

Table 5. RIIO-1 to RIIO-2 NGET NLRE Unit Cost Comparison

Unit Costs (£m/unit)	RIIO-1 Actual Average	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change
	(5 yrs)	(5 yrs)	(%)
Transformer	Redacted for commercial sensitivity		-21%
Reactor			15%
Circuit Breaker			88%
Cables			20%
OHL Conductor			-9%
OHL Fittings			-8%

7.11.7. NLRE Justifications

We have examined the justification for some of these cost areas in more detail (Volumes and unit costs have been redacted due to commercial sensitivity).

Protection and Control – total investment of £489m is proposed with average annual expenditure expected to more than treble during RIIO-2, justified because two technologies are reaching their end of life. NGET state that these are electro-mechanical protection relays (installed primarily in the 1960s with an expected

technical life of 60 years) and the first generation of computer based digital numeric protection relays (installed in the 2000s with expected technical life of 15-20 years).

We have not seen evidence of the condition assessments for the proposed Protection, Control, Metering and Monitoring asset interventions. NGET is taking a mixed approach of Selective Protection Asset Replacement (SPAR) of some assets and full replacement of others. It is unclear how robust the assumed mix of lower cost SPAR versus higher cost full replacement is, and therefore how robust the cost submission is.

Regarding the volume of interventions, NGET say they have based this on their Asset Health data, but we have not had sight of those, so it is not evident that the quantum of this increase is necessary. NGET's initial analysis, for example, suggests that the volume is somewhat judgemental, being reduced by 63% from a first estimate of [redacted], through further analysis and reassessment of residual life, to the proposal to intervene on [redacted]. Despite being based on 2018 data, between NGET's submissions to us in October and December, the volume of planned interventions in RIIO-2 reduced by around 14%, while the costs fell by 2%.

While NGET describe the SPAR process as targeted replacement of key components, and it does lead to lower costs than total replacement or refurbishment, it is unclear what alternative options have been considered, nor why this programme has not been phased over a longer period. The programme does not appear to be supported by actual site-specific asset condition data.

Cables and cable tunnels – NGET propose to invest £862m in RIIO-2, representing a doubling in annual expenditure and a 30% increase in volume. Over 90% of the expenditure is in the three large projects, London Power Tunnels 2, Dinorwig-Pentir, and Pitsmoor-Wincobank-Templeborough. We have not reviewed them in detail and are looking to Ofgem to challenge the scope and costs, as well as the treatment of any requests for funding in RIIO-2 in respect of elements that may have been deferred from RIIO-1. NGET say they have ring-fenced the LPT2 and Dinorwig-Pentir projects from a NARM perspective.

By NGET's calculations each project would appear to deliver a delta-risk reduction that offsets the underlying increase in cable risk during the RIIO-2 period, maintaining risk at today's levels. NGET have not demonstrated that maintaining cable risk at today's levels in fact represents best value for money in maintaining overall network risk constant; in short whether the proposed expenditure would deliver a higher NARM delta-risk reduction were it to be spent in another asset category. The remaining cable spend on substation cables is justified based on asset health data. Unit costs vary significantly across the three large projects due to specific factors, and we suggest these are reviewed by Ofgem. For the general substation cable spend of £37m, NGET has presented an analysis to show its unit costs are below the TNEI benchmark mean cost. We are unconvinced by this evidence and think that expenditure on these assets could be deferred without a significant increase in risk.

Transformers and Reactors – NGET propose to invest £273m with replacement volumes expected to be approximately 10% higher than current levels during RIIO-2. Unit costs appear to decrease, explained in part by the inclusion of five strategic spares in the RIIO-2 Plan. In their October submission, at our request, NGET provided a list of assets to be replaced and told us that the replacement plans were

based on site specific plant condition assessment. We have not seen those assessments and cannot comment on their robustness. In December we received a significantly amended EJP, stating that site-specific assessments have been made, and quantifying the contribution to the NARM delta-risk output target as r£48.1m. We remain unconvinced and Ofgem will need to confirm the cost and risk assessments in due course. In the absence of evidence to the contrary, we remain concerned that some of the named assets targeted for replacement during RIIO-2 are in fact deferrals of projects that have already been funded in RIIO-1.

Circuit breakers and Substation Bay Assets: volumes of in-situ circuit breaker replacements and refurbishments are forecast to fall from a RIIO-1 annual average of [redacted] to [redacted]during RIIO-2, and the unit cost to rise from £[redacted]m to £[redacted]m, partly due to the refurbishment:replacement ratio falling from 1.9:1 to 1.1:1. The NGET information used in the above tables appears to show an increase in circuit breaker unit costs. Total proposed RIIO-2 expenditure on Circuit breakers is £33m, to deliver [redacted] in-situ interventions. An additional [redacted] interventions are expected to be delivered with other RIIO-2 projects, so that the total NARM delta-risk reduction is r£64.5m.

At our request, NGET provided a list of specific circuit breaker assets for intervention, in the EJP accompanying the December Plan. We have not however seen site specific data to justify the circuit breaker or bay asset interventions, so it will be for Ofgem to confirm those in due course.

Expenditure on substation bay assets is increasing significantly to £228m. This expenditure is to replace surge arrestors and 132kV (or below) Earth Switches and Disconnectors, and to refurbish 400kV and 275kV Earth Switches and Disconnectors It is not evident why these increases are necessary or optimal, nor whether alternative options to replacement have been considered. The bay replacement programme appears to be based on largely age-related data; we have not seen site-specific condition data. NGET is proposing a PCD based on the volume of those non-lead assets, pending extension of the NARM mechanism to cover them.

Overhead lines and fittings: average annual expenditure on conductor replacement is forecast to increase by around 69% during RIIO-2. NGET state that this is due to more assets approaching end of life, and forecast to deliver [redacted] circuit km of overhead line conductor replacement in RIIO-2, compared to some [redacted] circuit km during the first five years of RIIO-1. There appears to be a unit cost reduction from £[redacted]k/km to £[redacted]k/km (excluding the Tyne Crossing), but we question whether this fully reflects the efficiency of scale from a much larger programme. Overhead line fittings expenditure is forecast to more than double from existing levels with a forecast to deliver [redacted] circuit km, but it is concerning that unit costs appear to be rising from £[redacted]k/km to £[redacted]/km. At our request a list of circuits for intervention and risk model data were added to the December submission, and a description provided of the available asset condition data. Ofgem however are better placed to assess those than we are.

The justification provided for the investment of £619m in conductors and fittings, is that it maintains network risk at around current levels, and delivers a combined NARM delta-risk reduction of r£208.6m. NGET cite the use of Linecore technology, which they say has significantly increased the volume of available condition data on which to base a better understanding of asset residual life and plan more targeted

interventions. They have also traded risk between conductor replacement and targeted fittings replacement to improve the deliverability and reduce the cost of the Plan. It is not possible to verify whether scope exists to trade (or adjust) the mix further. Were NGET to do so, the summary provided suggests that the costs of delivering the targeted NARM monetised risk reduction could be lower.

NGET say that targeted fittings replacement is much lower cost than full replacement, but that the same logic of targeted replacement cannot, they say, be applied to conductor replacement due to a lack of granularity in the data. Targeted replacement of fittings appears to make sense, provided the targeting is sufficiently discerning to replace poor condition assets only, and does not lead to early replacement of assets with significant remaining lives. NGET provided a graph of the expected percentage of intervention by circuit, with a range of 10%-90%. We have not seen detailed condition reports, and therefore recommend that Ofgem probe the assumptions on the residual life of those fittings being replaced, versus those being left in situ. For the latter, we suggest Ofgem also probe the condition data and CBA assumptions to ensure a cost legacy is not being stored up for future customers. We further suggest that NGET improves the granularity of conductor data to allow for consideration of targeted conductor span replacement, and explains why, given the other new data collection and diagnostic technologies that are available during RIIO-2, it makes sense to set ex-ante allowances on the basis of full conductor replacement.

Towers: NGET propose to invest £197m in Painting, Steelwork Recovery, and Foundation Works. The associated volumes are to be measured through a PCD output. Compared to RIIO-1, annual volumes and unit costs rise, for painting by 12% and 5% respectively, and for foundations by over 500% and 17%, while for steelwork recovery, annual volumes fall 75% and unit costs rise by 160%. The justification for painting is based on maintaining a target 18 year cycle, which NGET says adequately addresses steelwork coatings in the two poorest asset health categories. For steel work recovery, the investment appears to be based on asset specific health data from six-yearly helicopter inspections, and targets replacement or restoration of steelwork in the worst asset health category.

For foundations, NGET's proposals are based on an assessment which uses the ground conditions for each tower, from the British Geological Survey, and extrapolating data from actual works carried out in RIIO-1. An allowance is requested based on [redacted] units, deemed "likely to need an intervention in RIIO-2", but these are to be validated through intrusive investigations.

We would suggest that Ofgem consider the proposed number of interventions, and given the scope to combine site works across different overhead line activities, challenges the significant rise in unit costs. A formal commitment from NGET to report on progress in developing more robust data and asset modelling for RIIO-3 would also be helpful.

Other: the Plan includes £411m of investment in "Other" assets. The justification provided is mainly asset or asset type health indices and programmes based on targeting the poorest condition assets. Annualised volumes and spends are higher than in RIIO-1 in almost all categories. Of particular note are cost increases of 70% in LV boards. We would suggest Ofgem review the volumes and unit cost assumptions, and support including volumes delivered in the non-lead asset PCD.

IT: the Plan includes £176m of IT investment which we have not been able to assess. Taken with the cyber security investment described below, we understand that around £500m of IT/cyber expenditure is planned for RIIO-2, representing a significant proportion of total Totex. We are concerned that such expenditure may not be additional to BAU and may be duplicated elsewhere.

Cyber and telecoms resilience: NGET state that the Plan includes baseline expenditure of £218m for operational telecom and IT cyber security. This is a large increase over existing investment in cyber security. Investment of £187m is also proposed for the replacement of the operational telecommunications together with £54m on-going Opex, leading to overall investment of £241m. We have not examined this confidential element of the Plan but would ask Ofgem to examine whether this and other IT and telecoms expenditure is justified as terms of being additional to BAU, type of intervention, unit cost and volume, and that it is not duplicated elsewhere in the Plan.

Overall, we note from NGETs Business Plan Data Templates that NGET's expenditure on IT (£573m) and communications related activities (£241m) totals some £800m, more than 10% of Totex, and further uncertainty mechanisms are included in the Plan for additional expenditure. We have not been able to examine the options around this choice of intervention and are unconvinced that they are justified.

7.11.8. LRE

NGET's Business Plan Data Templates show a total of £1078m for load related costs, including connections and reinforcement expenditure. However, NGET's Plan document proposes £1320m for three main areas of load related expenditure in the baseline plan, namely:

- Network reinforcement and whole system (£933m)
- Generator/storage/interconnector connections (£245m)
- Demand connections (£142m)

Network reinforcement and whole system: the Plan includes the following breakdown of expenditure with £485m of the total also being identified as boundary reinforcement projects:

- Reinforcement (£507m)
- Protection studies (£31m)
- Generation closure (£135m)
- Facilitate competition (£182m)
- Optimise with ESO (£48m)
- Optimise with DNO (£31m)

The reinforcement projects should be conditional on the NOA assessment yet to be completed by the ESO which should consider if alternative non-network solutions are available e.g. flexibility providers or DNO's. Also, we note the capacity enhancements that NGET is introducing through new optimisation approaches such as 'Smartwire'. As such, given the uncertainty as to whether this expenditure will be needed, we think these projects should not be included in the baseline unless identified as the optimum whole system solution to network constraints.

It is unclear why additional expenditure above BAU is required for protection studies, facilitating competition, and optimising the network with other parties. In our view, these have not been justified as additional costs and may be duplicated elsewhere. We support the inclusion of efficiently incurred costs which enable whole system optimisation. If, after review, Ofgem decides to include ex-ante allowances or UMs for such costs, we agree that they should be tied to clear PCDs, and would like to see them agreed with the relevant other parties.

The NGET Plan sets out options for potential anticipatory investment in East Coast offshore wind networks, harmonic filtering, and EV infrastructure development. While we support the exploration of such concepts to optimise the whole system and benefit consumers, we agree that they are not sufficiently advanced to justify being included as anticipatory investment in the NGET baseline Plan.

Generator/storage/interconnector connections: the NGET Plan forecasts £245m of baseline connection costs (including sole use costs) to connect 15.3 GW of capacity, including 5.5GW of offshore wind and 4.7GW of interconnectors. The specific connections are not identified, so some uncertainty may be expected in this forecast particularly given the potential for substitution from distributed energy and flexibility resources.

Overall, it is unclear how these LRE forecasts reconcile with the NGET Business Plan data submissions and historic trends, which makes comparison and justification more difficult to assess. While efficiency targets are included, they are offset by significant increases elsewhere. Finally, none of NGET's baseline spend has been identified as being suitable for competition.

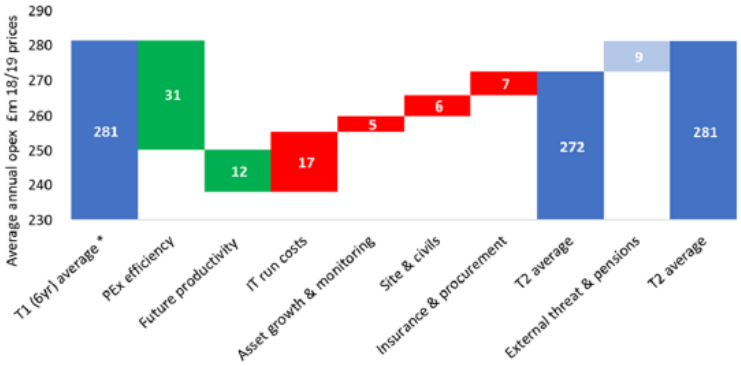
7.11.9. Opex

NGET's Opex submission proposes the following expenditure for RIIO-2, totalling some £1.4 bn.

- Direct Opex (£0.5 bn)
- Indirect Opex(£0.3 bn)
- Business support (£0.5 bn)

In examining the £1.4 bn of NGET RIIO-2 proposed Opex, we have used the NGET evidence in their Annex 14 – Total Opex. This proposes that average Opex costs for RIIO-2 will be £270m pa, a decrease of £10m p.a. (or around 4%) from the current run rate for the RIIO-1 1-6 year period. NGET's profile of upward and downward cost drivers behind this change is shown below.

Figure 14.10 Changes in Average Annual Opex between the T1 and T2 period



Overall, Opex is forecast to remain flat over the period with productivity gains offset by other cost increases. With a planned investment of £380m in IT, following an expected investment of £307m during the 8-year RIIO-1, greater efficiency savings might have been expected.

7.11.10. Totex sensitivities

In August 2019, we asked NGET to provide two downward sensitivities for Totex forecasts in their October Plan:

- A forecast for non-load related and Opex expenditures which is no greater than the annual average of RIIO-1 actual to end March 2019 (years 1-6 of the 8 year RIIO-1 period).
- The above with an additional efficiency reduction of 2% per annum in NLRE and Opex.

NGET identified the historic average NLRE as £2.25bn, 48% lower than in their Plan bid. A further 2% y-o-y reduction would lead to a further reduction of c£100m. NGET modelled the NLRE forecast by including mandatory work and already committed projects in a baseline and prioritised the other expenditure to achieve customer outputs. NGET say that the network risk would increase across lead assets by 40% and suggest this might lead to an additional 2 loss of supply events per year and that this backlog means they would be unable to efficiently deliver investment in future years.

For Opex, NGET identified the historical average at around £290m and their current forecast is around £280m. They state that further productivity gains are not credible and would impact network reliability in RIIO-2 and beyond. It is not an option they would be willing to consider.

7.11.11. Cost summary

Reconciliations of NGET's numbers with historic trends and the associated justification were difficult to locate in their Plans and supporting documentation. Overall, we found expenditure in the NGET Plan to be weakly justified and have identified the following areas of concern for Ofgem to probe further.

We have examined cost justifications covering some £5.4 billion out of the £7.1 billion baseline proposed by NGET and have concerns in a number of areas. Justifications for additional non-load related expenditure appear weak in a number of

areas and load related reinforcement expenditure appears uncertain. For other expenditure that we have not considered in detail (especially IT costs), we ask Ofgem to examine the justifications against RIIO-1 BAU expenditure. We are concerned that NGET has built a significant risk margin into its cost forecasts that may be removed later to the company's benefit.

We note that an additional £550m is included for security expenditure which we have not been able to assess and are concerned that that this duplicates existing expenditure allowances. In order to protect consumers, we suggest that any expenditure that is agreed by Ofgem should be included in the baseline on a use it or lose it basis.

Overall, NGET have provided more limited evidence than we would have expected to justify an estimated additional £1.5bn in asset health expenditure above current levels. Also, there is a lack of clarity about the allocation of expenditure forecasts. We are concerned that NGET forecast costs are higher than necessary, given evidence of the best benchmark costs being achieved elsewhere. The Plan does not demonstrate that NGET's track record of significantly underspending their RIIO-1 forecasts will not be continued into RIIO-2, although we believe some of the new output measures and better calibration of Uncertainty Mechanisms ought to be a partial step in the right direction.

NGET's annual average Totex expenditure for the 8-year RIIO-1 period is currently expected to outturn at some £900m pa (net of load related expenditure). An equivalent level of baseline expenditure might be considered appropriate for RIIO-2 given that peak demand and utilisation of the transmission network has been falling and that asset health expenditure might be expected to have a relatively flat profile.

Assuming baseline RIIO-2 load related Totex of some £500m (or £100m p.a.) for generator/demand connections is included for RIIO-2, this would result in a baseline Totex of about £5 billion compared to NGET's £7 billion proposal. We suggest that Ofgem considers whether this approach might be applied.

In our assessment, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements. We have considered NGET's justifications against the following:

- **Is it needed?** The engineering justifications and need cases are very generic. We do not think there is acceptable evidence for the volumes of intervention, and little evidence from actual asset condition.
- **Is the intervention appropriate?** The option assessments are high level. We do not think that all options have been fully considered and that there is an appropriate balance between risk and value for money e.g. lower cost refurbishment has not been fully considered
- **Is it efficient?** We do not see evidence from NGETs data that unit costs are efficient and are concerned that risk margins are being added to project costs.
- **Was it previously claimed under RIIO-1?** We think that a number of the NGET NLRE investments appear to have been deferred from RIIO-1 and would ask Ofgem to investigate further.

Overall, we have a low level of confidence in the justification for NGET costs especially non load related and non-operational Capex expenditure.

7.12. Engineering Justifications and CBA

NGET's CBAs and EJPs in the final Plan are in many cases generic, with some seeking to justify large sums of expenditure for major work programmes in one lump, rather than being at a project-level and site specific. We found the EJPs more useful than the CBAs, which conveyed little additional useful information, and appeared to be quite limited in detail. A number of variables (for example transformer losses) that we would have expected to see modelled, were left blank. The EJPs and CBAs taken together as a suite are also quite hard for the reader to navigate, in part because figures do not always seem to align between different sources. Following our request in October, the naming of assets for intervention in some of the December EJPs is an improvement, but we would like to have seen specific EJPs and CBAs for what are individually significant expenditure proposals, and recommend that Ofgem reviews these when they are made available. There was evidence that NGET had considered options as part of their CBA process, for example between refurbishment or replacement, or between intervening in the RIIO-2 period or waiting until a future period, but again these are on the whole presented as generic assessments.

Overall, the final EJPs were disappointing and without asset specific justifications, we found it difficult to gain confidence over the cost certainty in the proposals.

Non Load Related Expenditure was a particular area of focus for us because during RIIO-1, NGET delivered much lower volumes of interventions than assumed both in their RIIO-1 Business Plan and funded in their baseline allowances. By way of examples, during RIIO-1 NGET adopted a policy of life extension on Transformers, based on improved data and analysis, and in protection and control systems, deployed a strategy of targeted replacement of specific components, rather than more expensive whole system replacement. In-period decisions like these resulted in significant underspends and in customers paying more during RIIO-1 than would have been the case if the price control had been set with better knowledge of asset condition and a more informed view of the levels of life extension that were to prove possible.

We have therefore looked for evidence that the RIIO-2 proposals for NLRE are built on specific intervention plans on named assets, supported by robust asset condition data and independent verification that the proposed intervention is the right one. We have looked for a commitment from the Company that it has a high degree of confidence that the interventions and investments contained in the Plan are an accurate projection of the physical works that NGET intends to carry out to deliver its NARM outputs.

While an improvement on their October submission, notably by listing proposed assets for intervention, NGET has gone only part-way to providing this information alongside the December Plan. In discussion, NGET told us that detailed condition reports existed for each planned intervention on lead assets, but these were not provided. It was also concerning to see quite significant changes in EJPs between submissions in October and December. For lead assets, it is important that customers can be confident in the NARM output measure and we would suggest that Ofgem focuses on this. For non-lead assets, such as control and protection, NGET's

proposal for an initial volume-based output in respect of non-lead assets is considered to be useful in providing some measure of delivery against Plan commitment.

NGET has provided some evidence of independent cost benchmarking by TNEI. This shows a low-end, mean, and high-end cost for some, but not all of the spend categories. We understand that the Company has retained its cost forecast for categories where it is below the mean, and reduced its cost forecast to mean, where they were higher. NGET is therefore saying that its average cost is slightly below the TNEI mean, but we would challenge whether the Company's Plan could have been more ambitious by targeting the lower end of the TNEI benchmark cost range.

7.13. Finance

We have evaluated the financeability section of NGET's Plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement both with appropriately qualified consumers and our prior feedback in relation to financeability.

NGET's July Plan was non-compliant with Ofgem's Business Plan Guidance in a number of respects: it included no detailed assessment of financeability for the Actual Company and sensitivity analysis was described as a 'next step'. The Plan targeted a Baa1/A3 rating with no indication as to the reason for targeting ratings so much higher than those required to achieve investment grade. There was no detailed consideration as to how changes to depreciation and capitalisation rates could improve financeability or of consumer engagement in relation to trade-offs in individual elements relating to financeability.

The October Plan was considerably improved and showed evidence of engagement with our commentary on the July Plan, in particular in relation to compliance with Ofgem's Business Plan Guidance, which was largely achieved. The target rating had been reduced, helpfully, to BBB+, but there was no detailed explanation as to the benefits to consumers of a target rating still higher than the BBB- necessary to retain investment grade. There was evidence that some consideration had been given to the potential benefits of changes to capitalisation rates, but little indication that the proposed mitigation actions were either necessary or at the lowest cost to the consumer. There was still no evidence at all of consumer engagement in relation to specific elements of financeability.

The December Plan showed some improvement over the previous draft but was overall largely unresponsive to our comments on previous Plans regarding value to the consumer.

The data tables in the Business Plan for the Notional Company indicate to us that it is very likely to be financeable with a BBB+ rating with a 4.8% equity return, even without further mitigating actions. In our view, and in the light of the fact that most downside scenarios produce investment grade ratios even before mitigating actions, the Notional Company would probably be financeable even on the basis of a 4.3% Cost of Equity allowance, particularly with a BBB target rating. It is therefore disappointing that the company's interpretation is that this is not the case for the Notional Company.

There appears to be an acknowledgement the Actual Company is financeable at a BBB+ level without mitigating actions.

There is no evidence that the actions proposed to improve financeability have been drawn up with a view to minimising costs to the consumer. NGET explores (though eventually rejects) a change in the capitalisation rate. It shows this principally in the context of the scenario based on a 4.3% Cost of Equity allowance, but notes that a minimal change in the capitalisation rate of 0.5% would achieve financeability in the 4.8% Cost of Equity allowance scenario. Overall NGET effectively rejects all mitigating actions other than a higher cost of equity allowance and asks that that should be set at 6.5% real CPIH, which we regard as considerably higher than necessary to make the Notional Company financeable.

We are prepared to accept that there may be some merit in having headroom in target ratios over the minimum required to maintain an investment grade rating, but we have not seen substantive evidence from NGET that a BBB+ target is better value for consumers than a BBB target, despite suggesting in our response to the October draft that this was an area that would benefit from additional analysis. NGET has, for example, estimated that targeting a BBB rating would have an impact on the cost of debt of around 30bps but has not shown how this change could benefit consumers, for example through an assumption of higher gearing.

The Plan shows that, although NGET has undertaken detailed engagement on financeability with investors, there is much less evidence of engagement with consumers on issues relating to financeability such as higher gearing. We are particularly disappointed that the company has increased the ratio thresholds at which it considers the Notional Company to be financeable between the October draft and the Final Plan despite the fact that we emphasised the need to fully justify and engage consumers on proposals of this kind. We also note that NGET elected to focus narrowly on ratios that appeared unfavourable in the context of its target rating (in particular AICR) rather than attempting to produce a balanced overall assessment, which would, for example, have placed greater emphasis on the stronger debt/RAV ratios, the FFO/debt ratio and the important qualitative element of the ratings agencies' assessment.

Despite the clear message which we have given throughout that it was not helpful to use the finance sections of Business Plans to make the case for a higher Cost of Equity allowance, we note that NGET continued to do this in its Final Plan. Overall we do not consider this Plan provides value for the consumer.

7.14. Consumer Value Proposition (CVP)

NGET has significantly refined its CVP proposition since the October draft Plan and provided a useful summary showing User Group, CA and other stakeholder comment on the proposals included with the final Plan. Although the improved focus of the final CVP is welcome we consider that several of the elements put forward do not go beyond what should be business as usual in the current environment. This applies particularly in respect of proposals intended to reduce whole system cost (for example whole system approaches to reactor and low voltage substation build, which are things which should be happening as a matter of course including in some circumstances via the NOA process) and SF6 innovation, which is such a key issue for TO emissions that we would expect a responsible company to be engaging in innovation as a matter of course (we note also that SF6 emissions are subject to a

separate incentive regime) and Deeside, which is a valuable resource but which should again as a matter of course be available for cross-sector research given how it has been funded.

As regards improvements to natural capital (where NGET is targeting a 10% increase in environmental value of non-operational land over RIIO-2, with outperformance over 10% recognised under the Environmental Scorecard ODI) and energy not supplied (where there is a commitment to a tougher target at no extra cost), we think that the best proposals across the sector may warrant recognition but that these will need to be benchmarked carefully and the interaction with the ODI if allowed (we do not support it for reasons noted above) taken into account.

We think that there are a small number of proposals which seem to stand out as offering additional benefit and which appear to have the support of stakeholders (but on the basis of limited consultation). We have highlighted these below (using NGET's numbering from Table 5.4) but consider that CVPs should be subject to further scrutiny at open hearings:

CVP 1 Optimisation of harmonic filtering: this proposal could remove barriers to entry for smaller generators and therefore make a valuable contribution to facilitating the low carbon transition by helping renewable schemes to come on stream more quickly. We queried whether the proposal might prevent the emergence of a competitive market or lead to distortion in the renewable generation market and recommend that Ofgem should consider these issues, including the scope to ensure that if the concept of pooled harmonic filtering is established it could be opened to competition in the future.

CVP6 Supporting local urban communities: This is a targeted fund to support disadvantaged urban communities affected by network projects and assets (recognising the challenge from stakeholders that some of the benefits of visual impact mitigation should go to urban communities). The pot size proposed is not insignificant and governance and engagement will be important (we note that unlike the community-led grant scheme NGET proposes to take the lead in putting forward projects). However, we think this does have the potential to bring significant benefit to current and future consumers.

8. Company Report - National Grid Gas Transmission (NGGT)

8.1. Summary

The following table sets out our rating for the NGGT final December Plan, together with the average ratings we have given NGGT during its Business Plan preparation stages.

Table 1: NGGT Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms	n/a	
Outputs: vulnerable consumers	n/a	n/a	Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October Plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to red where we thought it was weak or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December Plan ratings – our RAG ratings on their final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the Plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is poor and the company proposals are not acceptable. Our explanatory comments are provided in this report.

8.2. Plan Highlights

- **Costs** - NGGT expects to overspend its totex allowance by 17% in RIIO-1 due to increased expenditure on asset health, IT and business support. Totex is forecast to increase by 54% between RIIO-1 and RIIO-2, largely driven by an increase in asset health and cyber security costs.
- **Outputs** – Most output targets are expected to be met in RIIO-1. For RIIO-2, NGGT is proposing 25 bespoke outputs in addition to sector outputs. Funding for some of these bespoke outputs is in the baseline, totalling £1 billion.
- **Financing** – NGGT states that its Plan is not financeable on the basis of Ofgem's Cost of Capital WAs without mitigating actions.

8.3. Track record

Ofgem's Business Planning Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company in these areas.

RIIO-1 Outputs – NGGT has met most of the output targets set for it. However, it has failed to meet some targets for system operation, environmental outputs and connections.

RIIO-1 Totex – NGGT expect to overspend Totex by £354m or 17%. Load related expenditure was very low at £46M reflecting very low activity in terms of new entry and exit connections. Non-load related Capex is higher due to asset health and environmental requirements. The non-load expenditure of £1,189M was £189M over the allowance; £99M of this related to asset health and the remainder related to Humber crossing costs and delayed compressor emissions work from prior to RIIO-1.

Non-operational Capex was higher to fund IT enhancements, and opex was higher to fund unanticipated increases in business support costs and additional costs related to maintenance of ageing assets.

RIIO-1 Returns – NGGT's expected return on regulatory equity is 7.2%, including 1.1% of financing outperformance.

8.4. Business Plan commitment and assurance

The main body of NGGT's Plan contains a Board Assurance Statement, signed by all board members and supported by a detailed annex. The assurance statement contains a clear statement that the board 'owns' the overall strategy and direction of the company's plan and it addresses accuracy, robustness and efficiency, ambition, value for money and stakeholder engagement. Financeability is not covered (though it is addressed in the annex). The wording of the assurance in relation to financeability has clearly been carefully chosen and the assurance is, in its effect, heavily caveated: although it opens with the statement that 'The Board provides the required assurance that, in its opinion, the Company's Business Plan is financeable', the caveating is very substantial and there is an explicit statement that the board 'is not agreeing to the financial framework and the working assumptions proposed by Ofgem'.

The statement in relation to governance is of good quality. There is a reference to compliance with the UK Corporate Governance Code and a detailed exposition both of the risk assessment process, which underlines the governance arrangements for the development of the Plan and of those arrangements themselves. Governance is based on a 'three lines of defence' system. All three elements are internal but the overall arrangements have been subject to review by EY. EY's brief appears to have been wide-ranging but there is little other external endorsement except in relation to triangulation of the stakeholder engagement (principally Frontier Economics). A sample of JRs and CBAs has been reviewed by external parties.

The Plan contains a statement that the company's short term bonus plans incentivise the delivery of financial, strategic and customer output measures but no detail is given.

8.5. Stakeholder engagement

Engagement to develop the Plan is acceptable, and uses a number of methods to engage directly with consumers. Sections at the start of each chapter set out what stakeholder views have been used to inform that part of the Plan, although the direct line between stakeholder feedback and specific proposals is not always clearly drawn.

NGGT acknowledges that it has further to go to embed a customer and consumer-centric culture throughout the business. It initially offered little detail beyond an internal communications campaign on how it planned to accelerate this process. However, we welcome the news in the December Plan that Board members have signed up to an engagement 'charter' which commits them to various actions including: tracking key stakeholder performance metrics; being actively involved in stakeholder engagement; and assuring that engagement is embedded across the business. This commitment to action from the top could prove an effective way to accelerate the embedding of both a stronger culture of engagement and a more effective customer focus.

The future strategy is acceptable and includes a commitment to ongoing research with consumers, including hard-to-reach groups, future consumers and fuel-poor customers. The Plan also commits to using a range of methods, including deliberative workshops. These are newer techniques for NGGT so they will inevitably have to go through a process to embed their use and impact in an effective way throughout the business.

Like all other companies, NGGT commits to an ongoing User Group and sets out a clear view of how the group can add value compared with the approach taken during RIIO-1. It wants the UG to 'set ambitious targets against which they will hold us to account'.

The future cost of 'enhanced' engagement is given as £850k per annum for the RIIO-2 period. The Plan says this includes a small central team plus the cost of additional SE activities and research including agencies and consultants. Given the way that its sister-company NGET distinguishes between the cost of enhanced engagement at a similar level, and business-as-usual engagement at a further cost of £3.7m per annum, it would be worth Ofgem clarifying the full cost of NGGT's engagement activities.

The Plan says that 88% of domestic and 82% of business customers find the 'average impact of' the Plan acceptable.

The Plan proposes two bespoke outputs as reputational incentives. One is to continue to track the satisfaction of non-customers, the second is to measure engagement with communities with construction projects, enabling stakeholders to provide feedback either digitally or by phone. These are legitimate activities but do not represent more than should be considered as standard given the significantly higher expectations that Ofgem has set out for engagement during RIIO-2.

8.6. Outputs

NGGT have provided 25 outputs described as 'bespoke', although some of these represent required outputs that are unique to the company. Eleven of these are identified as price control deliverables, seven are ODI-F, two are ODI-R and five are

licence obligations. Funding for PCD outputs is included in baseline Totex totalling £1 billion. This £1 billion of expenditure is for cyber/physical security, asset health and emissions activities.

While we welcome PCDs as a way of ensuring that outputs are delivered, we are unconvinced that all of these costs (and associated outputs) are justified in terms of scope, cost and timing and ask Ofgem teams to investigate further. The costs of delivering other outputs are not identified and may present additional costs over and above the baseline.

8.6.1. Customer Outputs

NGGT's Plan was general, non-committal and unfinished in this area until the final, December draft. This meant that the Challenge Group was unable to scrutinise this part of the Plan as fully as was intended by Ofgem. Although the Plan now proposes some targets, it also makes clear that these are subject to consultation in the period from December to March. Given that the purpose of the Plan is to present targets that have been built with, and tested by, stakeholders this seems an unacceptable timetable.

Ofgem makes clear in its methodology documents that it wants NGGT to set new, tougher and stretching goals in several areas. In our view, NGGT fails to do this in relation to its customer satisfaction proposals. It suggests a target of 7.8/10 - with a cap of 8.5 and a collar of 7.1. We do not think this is sufficiently stretching given that its most recent performance (in 2018/19) is already 7.8. NGGT argues that scores over 8 are disproportionately hard to achieve, but we note that three of the four gas distribution companies already achieve customer satisfaction scores higher than 9/10.

NGGT has included a number of operational outputs and incentives in its Plan, including:

- Quality of demand forecast
- Maintenance outages
- Entry/exit capacity constraint management
- Residual balancing
- NTS shrinkage

We note that these seek to improve existing operational performance incentive schemes by setting improved targets, which we welcome. However, it is unclear whether these changes are linked to additional costs or are already included in baseline costs, particularly in relation to the gas system operator costs. We note that many of these are still under development. We expect Ofgem to investigate this area further and assess whether the proposals are stretching and offer value for money.

8.6.2. Resilience outputs

Asset resilience – NGGT's Plan sets out a comprehensive approach to asset resilience supported by EJP's. We note that NGGT has made investments in asset data systems through RIIO-1 which is welcome, but we have concerns whether these systems are yet providing the required information to support resilience, given

NGGT's apparent reliance on external specialist expertise. However, we note that NGGT has taken action to address resilience issues during RIIO-1 and has overspent allowances as a result.

Workforce Planning – NGGT has provided a well-developed workforce resilience Plan, showing how it aims to develop a modern, diverse, high quality, well-trained workforce fit for the future. It identifies the need to address the retirement of staff in critical operational roles and competition for STEM skills.

Cyber Resilience – We have not reviewed the NGGT cyber Plan due to confidentiality requirements. However, our main challenge in this area would be for NGGT to separate out the key assets that must be protected (e.g. compressor stations) with other assets that are not critical in terms of system operation or security of supply. For example, if assets do not need to be remotely controlled then they may be more robust in relation to cyber security.

8.6.3. Environment

The Plan has developed at each iteration, and shows a response to challenge from stakeholders including the User Group and us, at least in some areas.

Particularly welcome are the changes to senior leadership accountability, which will in future include corporate focus on environment, moves towards quantified net environmental gain on projects and construction and the adoption of independently accredited sustainable sourcing and carbon neutral construction standards. Local communities will also welcome the significant spend on demolition of redundant assets and that the proposals to target sites on a risk-based approach and to consider repurposing before removal are in line with stakeholder expectations.

The Plan is heavily weighted to statutory compressor replacement. While environmentally beneficial, it is hard to give much credit for work which is driven essentially by legislation. We would have liked to see earlier moves to establish science-based targets – establishing the targets by 2023 places NGGT very much at the back of the pack - greater urgency in relation to addressing methane leakage (we do not think "establishing a baseline and using that information to begin to understand how to reduce emissions" is a stretching target) and more commitment to tackling HGV emissions (we commented in October that 'allowance should be considered for likely technology changes over the next few years)'.

8.6.4. Bespoke ODIs

NGGT are proposing three bespoke financial ODIs broadly related to environmental issues. Of these we have not considered in detail the shrinkage ODI but consider the benefits are not clearly environmental as opposed to economic in terms of energy being purchased at lowest possible price. There is also an EAP incentive to drive additional performance against EAP targets, worth up to £2.5m per annum and a separate GHG incentive, again to drive performance above the baseline, worth up to £1.5m per annum with the target measured in metric tonnes of CO2. Given that we do not consider that the GHG reduction targets are clear or that the company has generally demonstrated that it has set ambitious targets under its EAP we would not support an additional financial reward for activities which should be regarded as part of BAU.

8.6.5. Net Zero/Whole systems

The Plan is heavily focused on NGGT's role within gas, and within that is focused very much on hydrogen-based futures. While understandable, and granted that it covers all the key issues at least in passing, there is an issue around balance. There could also be more evidence of independent, rather than within-group, thinking and assurance (although there is reported joint working with SGN), a pledge to collaborate across industry on a hydrogen workplan and innovative solutions and for 'Best practice open data sharing and governance' across the energy industry.

That said, the thinking on hydrogen involves some genuinely new proposals. The plan is not entirely superficial: it goes into some detail on the practicalities of hydrogen, e.g. market regimes, as well as assets and the safety case but it does not include details of the specific steps or scale of investment required to accommodate hydrogen and increased access for renewable gases. There appears to be little or no discussion, however, of the extent of NGGT's assets that are compatible with 100% hydrogen nor any indication that work is planned to ascertain this potential optionality.

On whole systems, there is an acceptance of the leadership requirements inherent in being the national gas transmission company, and also acceptance that this will require capability and systems development. However, specific costs associated with this are comparatively low.

8.7. Digitalisation plans

In our October feedback, we advised NGGT that its digitalisation plan for December should set out further detail on its proposed approach, the expected benefits and how this will be delivered.

NGGT's December Plan set out a digitalisation strategy, which included an assessment of the blockages that IT was causing to effective working and the need to look again at IT infrastructure in the light of cyber threats.

An IT vision and strategy is provided which sets out the current and end state and how this will be implemented. IT investments of £55m pa are planned across a wide range of work areas and a high-level implementation plan is provided. Cultural change is addressed. Overall, while quite high level, NGGT has provided a digitalisation strategy addressing digital and data best practices, together with digital architecture design and associated delivery plans.

However, the plan is very inwardly-focused and does not consider how NGGT may interact with other network companies and wider digital initiatives.

8.8. Managing Uncertainty

In October we commented that the NGGT Plan set out many uncertainty mechanisms which seem to cover all the key risks faced by NGGT, ranging from reopeners on cyber costs, to Net Zero to 'unknown unknowns'. These are not defined, and we expressed our concern that major NGGT risks e.g. new connections, decommissioning appear to be passed to consumers. We asked for further clarification in this area.

The December Plan includes 12 uncertainty mechanisms, three of which are bespoke. They are listed in Table 1 below. NGGT has requested baseline funding for

projects at Bacton and Kings Lynn subsidence to establish the final technical solution, and non-baseline reopeners for the remainder.

Table 1. Uncertainty Mechanisms

UM – baseline variable Baseline funding requested as part of allowances. Where a PCD is defined (e.g. Bacton and King's Lynn), funding in baseline to deliver whole project. At set trigger point (reopener) cost allowances for PCD adjusted and new PCD set if applicable.	UM11 – Bacton terminal redevelopment UM12 – King's Lynn subsidence
UM – non baseline Funding for UM not included in baseline funding request At set trigger point (e.g. reopener) project parameters and baseline funding agreed. If an associated PCD, a new PCD will be created for delivery of rest of project or existing PCD adjusted.	UM1 – Cyber resilience UM2 – Physical security UM3 – Incremental capacity UM4 – Pipeline diversion costs UM5 – Compressor emissions King's Lynn UM6 – Compressor emissions Peterborough UM7– St Fergus site UM8 – Whole system UM9 – Quarry and loss of development UM10 – Net zero
UM – pass through Pass through costs as defined in Ofgem's sector methodology decision	UM11 – Gas transporter's share of Xoserve costs UM12 – Policing costs UM13- Conveyance of gas for independent systems

Overall, we think that NGGT has provided a reasonable set of uncertainty mechanisms, justifying specific areas of expenditure that appear uncertain. We have concerns that there may be some duplication with baseline costs in areas such as cyber security and compressor emissions.

We expect Ofgem to validate and assess these proposals, taking account of potential bias to the company's benefit. Where NGGT's proposals are taken forward, we expect the benefits to the company of risk mitigation to feed into an overall calibration of risk/reward within the price control settlement.

We note that RPE is not included in this list but that NGGT has set out arguments for RPE increases as part of its submission, which indicate that c. £150m of labour and material cost increases may arise during the RIIO-2 period. This seems very high and we would question the justification. Many of the costs that NGGT has proposed e.g. workforce costs are under its control, and residual cost drivers are likely to fall below a materiality threshold. Overall, we do not think these costs should be included in RPE indexation.

8.9. Efficiency – innovation and competition

Innovation – NGGT propose an innovation allowance of 0.75% of totex or £30.9m with around two thirds of this to be allocated to decarbonised energy systems. A large number of initiatives are proposed, together with a statement that some BAU funding will be provided as well, but not specifying the amount or specific projects.

Competition - NGGT identify 3 projects that potentially meet the criteria for early or late competition but discount them all as being unsuitable. NGGT also provide a native competition plan. We think that NGGT could have been more proactive and identified projects suitable for competition that fell below the Ofgem criteria.

Efficiency – NGGT propose to provide opex efficiencies of 1.1% pa and Capex efficiencies of 4% over the RIIO-T2 period. These are forecast to offer £88m of savings overall stating that these will be additional efficiencies to those already carried forward. We note these savings are quoted against a context of significant increases in Totex and are unclear whether these savings duplicate others or are reflected in excessive cost forecasts, so we have reduced our RAG rating from October, and would ask Ofgem to investigate further.

8.10. Costs

8.10.1. Forecasting and scenarios

In October we commented that the Plan provided little information to suggest that a pathway to Net Zero has been considered in any detail. The Plan appears to mainly justify the long-term need for gas transmission expenditure without considering alternative options and their implications. There are no options explored for investment deferral that reflect uncertainties in gas demand from potential Net Zero policies. We expect that these policies will result in a significant decrease to both annual and peak demands and NGGT and Ofgem need to consider the impact of downward demand pressures and lower capacity utilisation.

In December, NGGT stated that its Plan was tested against the ENA Common Scenario and the FES scenarios. It has proposed uncertainty mechanisms to allow adjustment as the Net Zero pathway becomes clear, and proposed shorter regulatory depreciation periods for new assets, which seems sensible if these assets are justified.

8.10.2. Costs - the NGGT Plan

In our feedback to NGGT on its July and October Plans, we expressed our concern that its cost forecasts were higher than necessary. In particular, NGGT did not appear to take due account of the declining demand for gas and capacity in its expenditure justifications.

The NGGT Plan proposes expenditure of £553m per year (excluding real price effects) totalling £2765m. It includes £33m of uncertainty mechanisms where NGGT is requesting baseline funding for feasibility studies.

This is around £400m lower than the NGGT July Plan of £3140m (but which included real price effects). If RPE is added, then the expenditure in the December Plan totals £2,895m. NGGT's breakdown of its Plan expenditure is set out in the Table 2 below.

Table 2: NGGT Expenditure breakdown

Figure 20.02 our costs

Stakeholder priority	Annual RIIO-1	Annual RIIO-2	Comparison of RIIO-2 vs RIIO-1
I want the gas transmission system to be safe	£17m	£14m	-£3m
I want to take gas on and off the transmission system where and when I want	£207m	£280m	+£73m
I want you to protect the transmission system from cyber and external threats	£36m	£118m	+£82m
I want you to care for the environment and communities	£43m	£55m	+£12m
I want you to facilitate the whole energy system of the future	£13m	£17m	+£4m
I want all the information I need to run my business	£8m	£8m	£0m
I want to connect to the transmission system	£4m	£3m	-£1m
I want you to be efficient and affordable			
Business support	£73m	£75m	+£2m
Additional capital efficiency commitment		-£11m	
Operational cost and productivity efficiency commitment		-£6m	
Grand total	£399m	£553m (Capex £355m, Opex £198m)	£154m
Non-controllable	£201,	£192m	-£9m
RPEs	£4m	£26m	+£22m

This Plan submission by NGGT shows a 39% increase for RIIO-2 from the £399m RIIO-1 8 year average. However, this is inconsistent with NGGT's data tables submitted at the same time which show a 54% like-for-like increase.

It appears that NGGT's Plan document uses total totex (including uncertainty mechanisms) as the average for RIIO-1, but the RIIO-2 average appears to understate the equivalent average for RIIO-2. We would ask Ofgem to investigate this difference and ensure that the figures are accurately compared.

Instead, we have used the key cost elements that are reported consistently by NGGT to Ofgem over price control periods, which are set out in the table below. This shows a different total to NGGT's above breakdown of expenditure. We have compared the actual RIIO-1 average expenditures (i.e. taking into account the overspends) with the RIIO-2 forecast expenditures as shown in Table 3 below.

For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Table 3. RIIO-1 Actuals v RIIO-2 Forecast

NGG Funding Category (£m)	Average RIIO-1	Average RIIO-2	Total RIIO-2	% Change
Load related Total	6	2	12	-59%
Compressor Emissions	34	31	157	-7%
Asset Health	87	122	610	41%
Decomissioning	2	17	83	769%
Other Non Load	1	- 0	- 0	-106%
Customer Contributions	- 1	-	-	-100%
Non-Load Related Capex Total	122	170	849	39%
Operational Costs	38	38	192	0%
Other Indirect/Non-Operational Capex	18	121	607	566%
Closely Associated Indirects	32	31	156	-1%
Business Support	34	33	163	-3%
Other Indirect and Non-Operational	-	24	119	>100%
SO Costs	88	101	505	14%
TO TOTEX (excl. UM)	250	420	2,098	68%
SO TOTEX (excl. UM)	88	101	505	14%
TOTAL TOTEX (excl. UM)	338	520	2,602	54%
TO TOTEX (inc. UM)	302	548	2,742	81%
SO TOTEX (inc. UM)	97	102	510	5%
TOTAL TOTEX (inc. UM)	399	650	3,252	63%
	-	-		

The main cost elements are set out in Table 4 below, highlighting where annual averages have increased from RIIO-1. Most categories show an increase. The most significant increases are in:

- An increase in average TO Totex (without uncertainty mechanisms) of 54% from RIIO-1 to RIIO-2 which seems high for a network where gas demand and capacity utilisation is decreasing.
- NLR Capex – a 39% increase mainly due to increases in asset health and decommissioning expenditure.
- Indirect/Non-op Capex – a c.£500m and nearly 6-fold increase mainly due to cyber and physical resilience investment plans.
- Indirect/Non-op Opex – a £119m increase mainly due to cyber and physical resilience operational costs.
- SO Costs – a 15% increase mainly driven by IT investment plans together with cyber and physical resilience costs.

We have found it difficult to use the cost breakdown from NGGT's Plan as this is broken down into new categories without giving a clear reconciliation and justification compared to past performance.

The following format of reconciliation tables are provided for NGGT's segmentation of totex but we think this information and supporting evidence should have been more clearly presented.

Table 4. Main cost elements

Table 14.02 summary of gas on and off costs by activity

(£m in 18/19 prices)	2022	2023	2024	2025	2026	Total RIIO-2	Annual RIIO-2	Annual RIIO-1
Asset health (general + GRAID)	119.9	138.6	131.1	133.4	140.8	663.9	132.8	86.6*
Asset health (Specific large projects)[31]	7.1	34.0	66.7	46.3	17.3	171.4	34.3	22.7
Asset management	64.7	66.7	68.7	65.5	65.8	331.6	66.3	60.4
Network resilience	0.3	4.5	4.2	0.5	0.3	9.9	2.0	0.0
Environmental resilience	0.8	0.7	0.8	1.0	0.8	4.2	0.8	0.5
Gas System Operation	39.4	44.0	45.2	43.5	39.4	211.6	42.3	36.4
Pension costs	1.3	1.3	1.3	1.3	1.3	6.5	1.3	N/A
Total	233.6	289.9	318.1	291.6	265.8	1399.1	279.8	206.6

*Note this includes RIIO-1 gas quality and metering, and control systems which are included in chapter 15 for RIIO-2.

Table 14.03 summary of gas on and off costs by RRP category

RRP category (£m in 18/19 prices)	2022	2023	2024	2025	2026	Total RIIO-2	Annual RIIO-2	Annual RIIO-1
Closely associated indirects(BPDT 2.02)	37.2	37.6	37.9	38.1	38.7	189.4	37.9	31.1
Direct costs(BPDT 2.02, 2.04)	47.0	47.4	47.5	46.9	46.3	235.1	47.0	41.7
Load related (BPDT 3.01)	0.3	4.5	4.2	0.5	0.3	9.9	2.0	0.0
Non load related (BPDT 3.01, 3.03)	123.9	169.5	194.8	176.6	155.0	819.8	164.0	109.2
Non-operational capex (BPDT 3.07)	11.4	13.0	14.7	12.5	12.8	64.3	12.9	10.8
SO capex (BDPT 3.08)	12.5	16.6	17.8	15.6	11.5	74.0	14.8	12.2
Total non-controllable costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5
Controllable Pension costs (BDPT 2.02)	1.3	1.3	1.3	1.3	1.3	6.5	1.3	N/A
Grand total	233.6	289.9	318.1	291.6	265.8	1399.1	279.8	206.6

8.10.3. NLRE

In assessing NLRE, we have examined the intervention/volume and unit cost justification for some of these cost areas in more detail.

- Asset health shows significant increases in pipeline, compressor train and plant and equipment expenditure. We have concerns about the justification for this expenditure and whether it is efficient. We think this cost forecast may be higher than necessary. We have looked at the asset health costs in detail in the following EJ/CBA section.
- Compressor emissions – while this cost is decreasing, we are concerned that expenditure may be taking place on assets where utilisation is decreasing and the assets may not be required.
- Decommissioning – which we would expect decommissioning costs to increase as asset utilisation falls, we find it difficult to reconcile these increases with the assumptions that NGGT seems to have made about ongoing asset utilisation.

We are concerned that expenditure in this area is higher than necessary and we have concerns that the volumes and costs of interventions are excessive, and that timings of interventions may be more advanced than necessary.

8.10.4. Indirect and Non-Operational Capex

This expenditure area is forecast to increase nearly six-fold from RIIO-1. It includes operational IT as well as expenditure for cyber and physical security. It includes the replacement of an operational telephony system. For security reasons we have not been able to scrutinise these plans, and Ofgem will need to undertake this work.

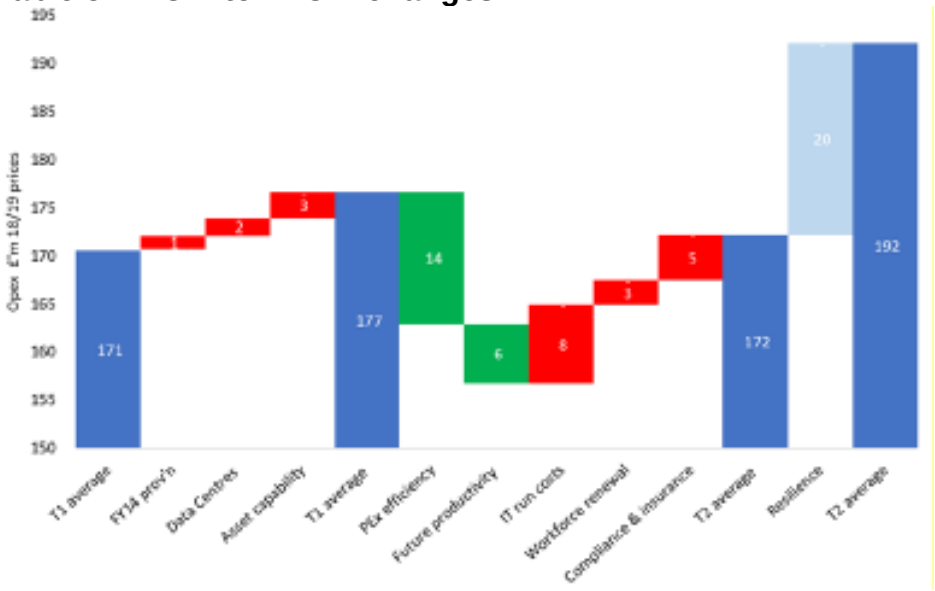
However, we are concerned that the need case for the proposed interventions may not be robust given the declining capacity utilisation of the gas transmission network and compressors. Also, the forecast costs and volumes will be uncertain, and may be duplicated across cost areas.

As such, we would suggest that Ofgem considers an approach to this expenditure where regulatory mechanisms are used to prevent customers bearing disproportionate risks associated with this expenditure. Ofgem may wish to consider removing uncertain costs from the baseline allowance and introducing a 'use it or lose it' approach to funding, or a reopener to allow additional expenditure as needed.

8.10.5. Opex

NGGT's opex changes between RIIO-1 and RIIO-2 are shown in Table 5 below, with upwards cost drivers shown as resilience, IT costs, insurance, and workforce renewal.

Table 5. RIIO-1 to RIIO-2 changes



IT, cyber and telecoms resilience - NGGT's Plan includes statements forecasting expenditure on IT (£180m) and cyber/operational telecoms resilience (£417m), totalling £597m. However, the business plan data submissions show a total of £351m for IT and cyber costs excluding operational telecoms.

We are concerned that these resilience and IT costs are high, may not be necessary, and also may be duplicated elsewhere in the NGGT Plan. We request that NGGT provide the necessary evidence to Ofgem to address this concern.

8.10.6. Totex sensitivities

In August 2019, the CG asked NGGT to provide downward sensitivities for Totex forecasts in its October Plan. We asked NGGT to describe a forecast for non-load related and Opex expenditure which was no greater than the annual average of RIIO-1 actual to end March 2019 (years 1-6 of the 8 year RIIO-T1 control period).

In its October response to us, NGGT advised that its NLRE for this scenario would have a budget of £0.87bn for RIIO-T2. NGGT applied a 3-stage approach to prioritising the investment portfolio for this scenario:

1. Safety legislation, which accounts for £290m (33% of the scenario budget).
2. Other mandatory expenditure e.g. security/environmental, which accounts for £618m (71% of the scenario budget).
3. Prioritise any remaining budget across the other outputs, starting with network reliability.

NGGT said this would mean a 51% reduction compared to its October 2019 draft Business Plan submission for the RIIO-2 period. NGGT stated that it was not possible to fully meet the scope of item two and it would not be funded for any further network investment to maintain reliability. This would be a significant risk for the gas transmission business.

NGGT have shown that its buried pipelines have a potential life of 100 years and the asset health relates to the above ground assets primarily as a result of corrosion. There are significant overlaps between safety legislation driven work, other mandatory work and network reliability. As part of the review of allowable costs for RIIO-2, Ofgem should explore budget sensitivities that take into account our comments on the EJs and the historical maintenance of these assets.

8.10.7. Cost Summary

In order to evaluate NGGT costs, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements. We have considered NGGT's expenditure against whether a) it is needed, b) the intervention and volume is appropriate, c) it is efficient, and d) it was previously claimed under RIIO-1.

The NGGT Plan shows a 54% increase from RIIO-1 levels primarily as a result of ageing assets and above ground corrosion. There are several areas of Totex where we have concerns about the robustness of the plan and think these forecasts are higher than necessary. These include:

- Cyber security, where the Plan appears to propose major expenditure (in excess of £500m) to enhance cyber security. The Plan does not appear to have fully considered a less costly option of limiting the risk from the connectivity of controls.
- Asset health – the Plan shows significantly increasing levels from the actual RIIO-1 expenditure level, which was higher than the allowance. We are not convinced that the Plan makes a compelling case that reduced levels of totex e.g. maintaining actual RIIO-1 expenditure levels for asset health, will breach mandatory and legislative requirements and materially impact security of supply risk.
- Whilst ongoing asset health expenditure is necessary, we are unconvinced by the level that NGGT proposes for RIIO-2. We think it should be able to undertake the necessary interventions over longer periods e.g. a 15 year period instead of 10 years, providing opportunities for savings and recognising that some assets are likely to be decommissioned in the future.
- The Plan shows significantly increasing levels from RIIO-1 despite falling gas demand. We are not convinced that the Plan shows that reduced levels of

Totex e.g. maintaining RIIO-1 expenditure levels for asset health, will breach mandatory and legislative requirements and increase service delivery risk.

- Network utilisation - as peak and annual demand falls towards 2030 this creates opportunities for NGGT to reduce and defer expenditure. An example is a main line compressor station that is less critical as running hours fall and there are alternative options to satisfy capacity. We understand that NGGT is undertaking network capability modelling based on lower running hours which we hope will result in lower costs. We are keen to see potential benefits flow through to consumers.

Overall, we have limited confidence in the evidence for the cost forecasts that NGGT has provided. While need cases are provided, we are not confident that the timing or scope of intervention exploits the opportunities presented by future declining gas demands and the ability to extend asset lives accordingly.

8.11. Engineering Justifications and CBA

In October we fed back that, while engineering justification submissions have improved, there is still a limited amount of firm evidence provided to support the need case and the intervention approaches to support the significant proposed increases in asset health expenditure by replacing assets rather than investing in maintenance and refurbishment. We said it would be helpful to see what European transmission companies are doing in this area as they have assets of similar age.

We noted that NGGT's pipelines justification report states that a critical part of the appraisal method is to assess the baseline position. The baseline is defined where you do not invest proactively in your asset base (i.e. you undertake legally required inspections and fix on fail), ensuring any reactive investment meets all PSSR, PSR and health and safety requirements. We requested that CBAs should clearly demonstrate an appropriate asset expenditure baseline and that any incremental investment offers value for money.

8.11.1. Asset health (£664m)

In December we received a comprehensive set of CBAs and undertook some sample reviews on asset health expenditure, which totals £664m in the NGGT Plan, as shown below. We looked at the most significant areas (around £590m out of £664m) and have made some high level observations.

Table 6. Asset health

Table 14.15 asset health cost summary

(£ in 18/19 prices)	2022	2023	2024	2025	2026	Total RIIO-2	Annual RIIO-2	Annual RIIO-1 *
Cab Infrastructure	7.0	8.9	6.0	4.2	5.2	31.3	6.3	2.6
Compressor Train	50.0	29.3	7.3	9.1	17.9	113.7	22.7	9.8
Plant and equipment	17.8	33.1	38.8	38.6	28.2	156.4	31.3	9.5
Valves	6.4	13.9	14.6	13.9	14.4	63.1	12.6	19.2
Pipelines	20.1	26.9	32.0	30.8	33.7	143.5	28.7	16.2
Structural Integrity	7.0	9.6	19.5	22.0	21.4	79.5	15.9	13.0
Electrical	1.1	6.0	6.8	5.9	8.6	28.5	5.7	2.8
St Fergus (subsidence)	4.0	0.0	0.0	0.0	0.0	4.0	0.8	0.0
OPEX	3.1	3.1	3.1	3.1	3.1	15.5	3.1	N/A
GRAID	3.4	3.4	3.0	4.8	3.8	18.3	3.7	1.0
Stopples	0.0	4.5	0.0	1.0	4.5	10.0	2.0	N/A
Total	**119.9**	**138.6**	**131.1**	**133.4**	**140.8**	**663.9**	**132.8**	**74.1**

Compressor Train - NGGT explain that many existing compressor assets are very old and require significant expenditure for them to remain in operation. They say that, given the relatively short lives of new compression plant, it is likely that the majority of the fleet proposed for investment will be required over the next 10 – 15 years even though running hours are highly uncertain.

We are concerned that this investment may not all be required. We request that Ofgem review the forecast running hours through to 2030 for the gas generators and power turbine investments to ensure that major investment is not proposed for compression related plant with very low forecast running hours post 2030 and with relatively low consequence of failure. The latter point is key in making economic and efficient investment decisions when capacity utilisation is falling and more gas is delivered at relatively new southern GB entry points which are close to sources of demand (Milford Haven and Isle of Grain LNG in particular).

NGGT have made the case that for certain compressors there is no other option to supply customers (e.g. SW power generation) but it may be that for many assets there are alternatives that can be used together with commercial capacity options. The investment in new variable speed motors may be able to be deferred if the running hours to date do not justify full replacement.

We would also question whether the NGGT contracting strategy enables alternative approaches with lower costs particularly in less critical stations with both standby capability and capacity alternatives. For example, asset life extension techniques applied offshore UKCS may be useful in supporting deferment of investment at this uncertain time.

Cab Infrastructure - The “Compressor Train” principles above also apply to cab investment. The EJ makes a reasonable case that investment is required to ensure these assets can remain in service. The issue for Ofgem is whether any can be delayed due to running hours or non-criticality.

Plant and Equipment - The EJ provides a good breakdown of the proposed investment. Given the materiality of this investment, the CG believes this is an area that requires detailed engineering review and challenge. We provide some specific suggestions for Ofgem to consider:

- For Above Ground Pipe and Coating, Ofgem should review this to ensure that NGGT is not being funded for significant works as a result of a failure to carry out earlier intervention. If a painting intervention was implemented at CM/4 Grade 2/3 then the asset would not reach Grade 5/6 and require more significant expenditure. For example, Ofgem could take a random selection of the 375 sites with above ground pipework and establish from NGGT the extent of earlier interventions to build confidence in the historical maintenance
- Cathodic protection and Insulation Joints – lack of unit cost data from RIIO-1 as none of this work appeared to take place. This suggests there may be possibility of further deferment into RIIO-3. We are also concerned that this cost is based on generic modelling rather than actual condition information and we are not convinced by the forecast of catastrophic failures in the 2030's if this investment is not made.
- Ensure use of feedback from decommissioned assets in relation to assert condition with refurbishment likely to be a good option in many cases if conditions allow.
- Carry out additional surveys prior to work to ensure satisfactory assets are not being replaced.
- Consider reinforced plastic for below ground fuel gas pipework.
- Review requirement for NTS flow control and heating to ensure there is a robust justification for both.

Valves - The EJ for a valve replacement programme appears sensible in principle. The concept of Refurb and Re-life team for valves is welcome and should be considered for other asset classes (e.g. above ground pipework). NGGT's National AGI Renovation Campaign (NARC) seemed to be efficient and a similar approach could be applied to valves if possible.

However, the valve work represents a significant programme and Ofgem and NGGT might consider having a number of phases to the Valve programme in RIIO-2. For example:

- Phase 1 to intervene on 25% of valves in the programme and then complete a review of the interventions and costs.
- Phase 2 to carry out further valve work in RIIO-2.
- Phase 3 would be RIIO-3 and beyond.

Pipelines – Our key concern in this area relates to the cost of intervention driven by Close Interval Potential Surveys (CIPS). This is a specialist area and we would suggest that Ofgem uses independent expertise in this area to ensure that the proposed strategy is efficient and is not leading to expensive interventions that are not necessary.

Structural Integrity - The level of investment in RIIO-2 is similar to that in RIIO-1 in this category. A campaign type approach may deliver savings together with having an expert team who can identify where repair options may be acceptable at lower cost.

Specific large projects (£171m)

1. **Bacton (£144m) -** The EJ makes a case for a brownfield redevelopment of the site rather than continuing repair and refurbishment. We recognise that NGGT has carried out extensive consultation involving stakeholders and the recommended brownfield option appears sensible in principle. However, we have the following points for NGGT and Ofgem to consider:

    - The original Bacton terminal had a major requirement for blending as a result of the Lowest Source CV regime that applied at that time, this is no longer the case.
    - The original blending requirement of the terminal led to a high number of block valves and many of these may no longer be required. A brownfield terminal can have the minimum number of valves necessary to deliver the requirements.
    - There are other items that may no longer be required in a new Brownfield terminal and these should be reviewed ahead of project approvals. For example:
    - Fire water system (required when there was Odorant injection).
    - Pressure control/pre-heating (ideally no heating should be required).
    - Offering a blending service to UKCS producers is a good idea and should be progressed with benefit shared between NGGT and shippers. It would make sense to establish the rules for blending ahead of the approval of the brownfield terminal as this is likely to have a material Capex impact and the risk of the service not being required should not fall on NTS customers alone.
    - Any legacy NEA Obligations (e.g. to accept lower quality gas in summer from certain sub terminals) should be reviewed and a cost reflective charge applied (related to blending Capex) if these are to continue in the redeveloped terminal.

2. **Kings Lynn (£31m) -** The EJ makes the case that the subsidence on site needs action otherwise there is growing risk of failure. The principle of a major investment to remove the subsidence/stress risk is accepted. However, we suggest that NGGT and Ofgem review the differences between the proposed Rebuild option (£31M) and the Uni Directional Option with one off change (£19M).

    - It would represent an efficiency if NGGT was able to identify a technical option to allow the £19M cost to be Bi-Directional. It may be worth having a short competition with the supply chain to identify options to deliver the Bi-Directional facility at lower cost.

3. **Blackrod (£9m)** - The EJ makes the case that for the security of supply of Cadent customers a short new pipeline to connect the Blackrod AGI to feeder 21 is the most economic option. The £9M option appears reasonable and it would make sense to link Feeder 11 (Blackrod) to Feeder 21 which is only 1km away.

- However, we believe this project may be best justified by Cadent and not NGGT and we would suggest that Ofgem ensures that Cadent support would continue if it was funded as part of Cadent Totex and not NGGT Totex. It would also be worth considering a smaller diameter pipeline to reduce costs without fundamentally impacting the security of supply driver as this could be coupled with other interventions (e.g. at the Heapey Dam Block valve site) and other possible Cadent interventions. NGGT could consider alternative contracting approaches to reduce the cost of this pipeline that appears expensive due to mobilisation and other fixed costs.

8.11.2. Summary

While greater justification has been provided, we remain concerned that some of the engineering justifications and CBAs may be subject to significant uncertainty and potential overstatement of risk and cost.

Given the limited time we have had to examine these justifications, we will rely on the further examination by the Ofgem teams. We would like to see evidence that engineering justifications are based on specific projects and use evidence of historic actual asset condition to corroborate asset health models and ensure that historic maintenance has been appropriate.

The CBAs do not fully examine options for future energy scenarios with reduced capacity utilisation which allows greater use of alternative options. We are concerned that investment projects with long paybacks are being supported when deferment may be a better option for customers. Again, we would ask Ofgem to examine this area further.

8.12. Finance

We have evaluated the financeability section of NGGT's Plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable and how far relevant measures to aid financeability have been considered at the lowest cost to the consumer, and evidence of effective engagement with both suitably qualified consumers and our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem's WAs.

NGGT's July Plan was non-compliant with Ofgem's Business Plan Guidance in a number of respects: it included no detailed assessment of financeability for the Actual Company and sensitivity analysis was very limited. The Plan targeted a Baa1/A3 rating with no indication as to the reasons for targeting ratings so much higher than those required for investment grade. There was no detailed consideration as to how changes to depreciation and capitalisation rates could improve financeability or of consumer engagement in relation to trade-offs in individual elements relating to financeability.

The October Plan was considerably improved and showed evidence of engagement with our commentary on the July Plan in particular in relation to Ofgem's Business Plan Guidance with which it was largely compliant. The target rating had been reduced, helpfully, to BBB+ but there was no detailed explanation as to the benefits to consumers of a target rating still much higher than necessary to retain investment

grade. There was evidence that some consideration had been given to the potential benefits of changes to capitalisation rates and in particular deprecation rates, but little evidence that the mitigation actions were either necessary or at the lowest cost to the consumer. There was still no evidence at all of consumer engagement in relation to specific elements of financeability.

The December Plan showed some improvement over the previous draft in terms of additional engagement with consumers on the depreciation assumption, but was overall largely unresponsive to our comments on previous plans. The data tables in the Business Plan for the Notional Company indicate that it is very likely to achieve a Baa1 rating using Ofgem's WAs with a 4.8% equity return, even without further mitigating actions, at least under Moody's assessment criteria. In our view, and in the light of the fact that most downside scenarios produce investment grade ratios even before mitigating actions, the Notional Company would probably be financeable even on the basis of a 4.3% Cost of Equity allowance, particularly with a BBB target rating. It is therefore disappointing that the company's interpretation is that this is not the case for the Notional Company and that it has failed to make a clear statement as to whether the Actual Company is financeable without mitigating actions.

There is no evidence that the actions proposed to improve financeability have been drawn up with a view to minimising costs to the consumer. NGGT explores (though ultimately rejects) a change in the capitalisation rate. It also states that there is a strong case to change the depreciation profile to a sum of digits approach (similar to that employed in gas distribution) but, curiously, has not included this assumption in its base case scenario using Ofgem's assumptions (even though it recommends this change and includes it in the financial package which it proposes). Overall NGGT effectively rejects all mitigating actions other than a higher Cost of Equity allowance and asks that that should be set at 6.5% real CPIH, which we regard as considerably higher than necessary to make the Notional Company financeable.

We are prepared to accept that there may be some merit in having headroom in target ratios over the minimum required to maintain an investment grade rating but we have not seen substantive evidence from NGGT that a BBB+ target is better value for consumers than a BBB target, despite suggesting in our response to the October draft that this was an area that would benefit from additional analysis. NGGT has, for example, estimated that targeting a BBB rating would have an impact on the cost of debt of around 30bp but has not shown how this change could benefit consumers, perhaps through higher gearing. We set our commentary on NGGT's October submission the fact that we considered consumers could potentially benefit from higher gearing and would have liked to see evidence of engagement with the comment in the Final Plan.

The Plan shows that, although NGGT has undertaken very significant and detailed engagement on financeability with investors, there is much less indication of engagement with consumers on issues relating to financeability and in particular the various trade-offs that those imply. The limited engagement which is evidenced, in particular in relation to depreciation allowances, does, however, indicate at least some engagement with our August and October commentaries. We are particularly disappointed that the company has increased the ratio thresholds at which it considers the Notional Company to be financeable between the October draft and the Final Plan despite the fact that we emphasised the need to fully justify and engage consumers on proposals of that kind. We also note that NGGT elected to

focus narrowly on ratios that looked particularly unfavourable (in particular FFO/debt) in the financeability analysis rather than attempting to produce a balanced overall assessment, which would have placed greater emphasis on factors such as the stronger debt/RAV ratios, the overall more favourable picture using Moody's assessment framework and the important qualitative element of the ratings agencies' analysis.

Despite the clear message which we have given throughout that it was not helpful to use the financeability sections of Business Plans to make the case for a higher Cost of Equity allowance, we note that NGGT has continued to do this in its Final Plan. Overall we do not consider its Plan provides value for the consumer.

8.13. Consumer Value Proposition

In October NGGT put forward a very extensive list of proposals, most of which seemed to us to be part of their normal business activity and we gave strong feedback that we did not envisage that CVP should be rewarding BAU.

The December Plan includes a shorter list, comprising both quantified and qualitative proposals. Although the list has been refined, in part through stakeholder engagement, we consider that the majority of the proposals put forward are still things which form part of the normal business activity or are not obviously offering more than customers are entitled to expect. This applies in particular to work to improve resilience of the network, roll out of security software, which we regard as BAU for a network company, focusing on methane reduction, which is the key environmental impact of the business or rolling out of low cost connections innovations into BAU.

There is a **community fund proposal** to commit 0.3% of cost of major projects to fund community improvements in areas where NGGT is carrying out works. Like those offered by other companies this is supported by stakeholders and has some strong features including the focus on benefiting those affected by major construction work. We think this could be considered to deliver additional value although the claim that it has no cost will need to be substantiated.

There are two environmental initiatives which are potentially going further than other companies and pushing forward what good looks like. These are the proposal for **carbon neutral construction by 2026** and the proposal to **enhance the natural value of non-operational land by 10%** over the course of RIIO-2. Both of these should in our view be benchmarked against the proposals from other companies. We note that the carbon reduction commitment relies on offsetting to achieve full carbon neutrality, which makes it difficult to assess the real value in driving best practice. The biodiversity commitment is welcome and looks to be amongst the stronger commitments in this area but again needs to be benchmarked. We also note that there is a separate EAP ODI and we would want to ensure that there is no scope for dual reward.

9. Company Report - Northern Gas Networks (NGN)

9.1. Summary

The following table sets out our rating for the Northern Gas Networks (NGN) final December Plan, together with the average ratings we have given NGN during its Plan preparation stages.

Table 1: NGN Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms		
Outputs: vulnerable consumers			Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October Plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to red where we thought it was weaker or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December Plan ratings – our RAG ratings on the final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the Plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is weaker and the company proposals are not acceptable. Our explanatory comments are provided in this report.

9.2. Plan Highlights

- **Costs** - NGN expects to underspend its Totex allowance by 12% in RIIO-1 due to efficiency improvements. For RIIO-2, NGN's Totex is forecast to increase by 4%, driven by an increase in Repex. NGN is forecasting a 0.5% p.a. efficiency increase and a limited number of uncertainty mechanisms.
- **Outputs** – All output targets are expected to be met or exceeded for RIIO-1. For RIIO-2, NGN is proposing 24 bespoke outputs, all funded from baseline Totex.
- **Financing** – NGN states that its Notional Company is financeable at a rating of BBB+ on the basis of Ofgem's Cost of Capital WAs, without the need for mitigating actions.

9.3. Track record

Ofgem's Business Plan Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs – NGN expects to meet or exceed all its output targets set during RIIO-1.

RIIO-1 Totex – The Plan explains the transition from RIIO-1 to RIIO-2. NGN claims it is ranked as the most efficient GDN, 6% ahead of the next most efficient, 9% ahead of the sector average and 20% ahead of the least efficient in the sector. NGN expects Totex outperformance to be £254m (or 12%) below allowance of £2185m. NGN claims £344m of efficiencies were delivered in RIIO-1 and have been carried forward into RIIO-2.

RIIO-1 Returns – NGN's expected RORE is 11% over the RIIO-1 period. NGN has set out the key drivers behind these returns and the level of payment distributed to investors.

9.4. Business Plan Commitment and Assurance

NGN's Plan includes an assurance statement from the chairman on behalf of the board. It falls short of a clear statement about the accuracy, ambition and efficiency of the Plan but there is a reference to the Plan being 'resilient to the key risks over the RIIO-2' period and to the robustness of the assurance process (although this is not a reference to the robustness of the Plan itself). The Plan makes clear that the Board, and in particular the SIDs, have been centrally involved in the process of its development, and one of the SIDs is described as having been a 'full-time member' of the company's RIIO-2 Steering Group. The required statement that the Board considers the Plan to be financeable during the RIIO-2 period on both a notional and an actual basis using Ofgem's WAs is included but caveated by an accompanying statement that this should not be interpreted as acceptance of Ofgem's WAs in relation to Cost of Capital allowances or of financeability beyond RIIO-2. There is a strong emphasis on consumer engagement in relation to assurance but a reasonable degree of distinction between engagement and assurance is implied (i.e. consumer engagement has not been treated as a substitute for Board assurance).

The assurance process has been subject to detailed review by EY and the 'Business Plan Assurance' appendix consists of their extensive report. The report contains helpful assurances about the process of developing the report and a number of statements in relation to its deliverability but it is to be noted that these are based on a review of the evidence supplied by NGN and do not, in and of themselves, constitute Board assurance. The statement in relation to financeability is specifically limited by a statement that it is based on NGN's proposed financial parameters. There is further external assurance, particularly in relation to finance: both Oxera and KPMG have reviewed the financial model and KPMG has also undertaken an assessment of business support costs.

The Chairman's assurance statement includes a reference to a review of employees' terms and conditions during RIIO-1 and the fact that, as a result, 'individuals at all levels of the organisation now face the right financial incentives to deliver' on commitments to customers during RIIO-2. There is further detail in the Plan covering

the fact that corporate targets now account for 50% of the 'bonusable objective' of the senior leadership team. We can trace no detail of weighting for non-financial measures nor information about any LTIP that there may be. As a result, we consider NGN's Plan falls short of providing a clear statement that remuneration of staff and senior management is aligned to performance of the RIIO-2 Plan.

9.5. Stakeholder engagement

NGN's Plan presents a thorough and well-articulated approach to stakeholder engagement. It quotes compelling extracts from a recent independent audit of its stakeholder engagement approach against the AA1000SE standard that describes its approach as representing 'best practice'.

The impact of stakeholder engagement on the Plan is well evidenced. The Plan includes a clear discussion of trade-offs and provides evidence that this triangulation of views has led to some moderation of its proposals. The level of acceptability recorded appears high (92% of domestic customers say that the Plan is acceptable and 85% of households say that the bill impact is affordable).

The way in which the future strategy meets Ofgem's principles is well explained. A particularly strong element of the future strategy is the commitment to a Citizens Jury which NGN will convene three times a year to 'deliberate on the difficult and important challenges the business has to face'. In general, NGN made laudable efforts to understand the views of hard to reach groups and to hear seldom-heard voices in its engagement to create the Plan.

The future cost of stakeholder engagement is given as £3m per annum, which NGN says includes all relevant costs. It says that it has tested its approach with stakeholders, especially with its Citizens Jury, to ensure that they agree the approach represents value for money.

No bespoke incentives are proposed in this area, although NGN's commitment to ongoing enhanced engagement and to the transparent reporting of its future delivery is as strong as others.

9.6. Outputs

NGN has provided 24 bespoke outputs in addition to those required by the sector methodology. Eighteen of these are identified as ODI-Rs, three are ODI-F, and three are licence obligations or PCDs. Funding for outputs is included in baseline Totex but most are not broken out in detail.

We welcome PCDs as a way to ensure that outputs are delivered, and that output funding is included in the baseline Totex. But we are concerned that the lack of specific justification may lead to duplication of costs and inefficiencies. We would ask the Ofgem teams to investigate further to ensure that these outputs are appropriately targeted and offer value for money.

9.7. Customer Outputs

Many aspects of this section are good, including NGN's Plans for how it will restore service during unplanned interruptions. Its relatively ambitious targets in this area, backed up by higher voluntary compensation payments with earlier triggers, stood out compared with other Plans.

On customer service, there is an encouraging ambition to achieve 'industry leading scores' under the tougher methodology being developed with Ofgem although no specific target is volunteered.

The Plan also sets out a large number of bespoke outputs. These are positive commitments, including extra compensation payments for missed connection dates and repair targets to reduce leakage with a cost-benefit analysis (CBA) based around reductions in levels of carbon. Some cost breakdowns are given but NGN makes an overall comment that it will not drive an overall increase in Totex in this area. This is in line with the feedback that, although stakeholders welcome ongoing improvements in service, they do not want to pay more to improve areas where performance is already good.

9.7.1. Vulnerability

We thought that the overall approach to supporting customers that NGN sets out in its October Plan was promising, and this was incrementally improved in the December Plan, notably the size of the hardship fund was increased to £150k from £50k following CEG and stakeholder feedback. NGN also reviewed its approach to PSR referral following CEG challenge.

In October we thought the outputs presented for consumers in vulnerable situations demonstrated a good level of ambition. Overall the approach has been to move large parts of GD1 performance into BAU, which is welcome, and evolve the service offering through GD2. These outputs have been well evidenced on the whole and there was a qualitative articulation of the benefits. We asked for a fuller articulation of value for money or costs when we provided feedback in October and this has been reflected in the December submission.

In October we noted that proposals relating to the Consumer Vulnerability reputational incentive (annual showcase and reporting) were missing from the Plan and these areas have now been provided. In October we noted that the Plan did not articulate a partnership or a multi-agency approach. There is more discussion of partnering across utilities and strategically in the December Plan, but this approach is not as full or as strategic as those proposed by other GDNs.

We have also challenged NGN on its FPNES target. Initially in July we thought that NGN's target of 1,000 fuel poor connections was unambitious. NGN reflected on this and in October proposed an improved stretch target of 2,000, which it also presents as a bespoke incentive. We note that NGN will only claim the full value of the award if it can prove the home is more energy efficient once connected to gas. NGN has also provided more information about how this stretch target will function. We think that this is a welcome proposal but we note that this stretch target is still below GD1 levels.

9.7.2. Resilience outputs

Asset resilience

NGN's July Plan contained limited information about how asset resilience would be assured during RIIO-2. In October, further information was provided to fill some of the gaps identified in the July Plan. In our October feedback to NGN, we noted that NGN first transferred its maintenance staff to a contractor and has now bought them back in-house. We requested that NGN's December Plan should explain any

implications to system resilience in terms of staff competence in this area which could be critical in any move to hydrogen. We have a residual concern that professional gas engineering capability is limited and, whilst appropriate for the business today, it does not have capacity for the significant technical challenges associated with hydrogen.

NGN's December Business Plan sets out the company's views on asset health, criticality and replacement priorities. This forms the foundation of the Totex Plan.

The Plan sets out a reasonable approach for delivery of a resilient network. However, we don't think that NGN's CBA fully demonstrates that the selected investment options deliver sufficient net benefit for existing and future consumers. Given the expected future decline in gas demand, we think there may be further options that could be explored to reduce investments, particularly those with a long pay-back period.

Workforce Planning

NGN's Business Plan provides a reasonable description of how it will develop a modern, diverse, high quality and well-trained workforce fit for the future. A priority is placed on the use of modern terms and conditions, the reduction of average staff age and increased investment in training and apprentices. However, we note that the workforce is competent for today's business, which is focused on mains replacement and escapes, and is not necessarily ready for a hydrogen future which potentially invests significantly in new assets with high technical content. For example, the number of Chartered Engineers will likely need to be increased in the future if the hydrogen pathway is taken.

Cyber Resilience

The NGN Business Plan provides a good description of a BAU IT Security Plan and an incremental Cyber Resilience Plan in response to the Network and Information Systems Regulations 2018.

9.7.3. Environment

The NGN environmental ambition was comparatively weak in early drafts of its Plan, but, in response to feedback from us and other stakeholders, it has been markedly strengthened in the final draft Plan. In particular, the ambition on scope 1 and 2 reductions is clear, science based and consistent with Net Zero by 2050. There has been an improved engagement with the biomethane agenda – though perhaps more to do over the RIIO-2 period. Certainly NGN's projections are less impressive than some other companies' - and an important trial of injection of 20% hydrogen is genuinely pushing the limits (although since this is already underway, it is not entirely a RIIO-2 initiative).

Plans for shareholder-financed tree planting are a clear, costed initiative although we note that there should be a proper assessment of the biodiversity and carbon fixing benefits. Work with the supply chain and on waste appear fully in line with EAP guidance.

Plans for commercial fleet replacement are expressed to be flexible to accommodate technological change during the RIIO-2 period. Targets for reduction in scope 3 emissions in the RIIO-2 period seem relatively unambitious.

9.8. Net zero/ Whole system

There is some good material in the Plan and continuation and development of existing pilot proposals. But there is not as yet a full or equal assessment under the full range of scenarios for decarbonising heat – BEIS end states are referenced, but it is not clear they are at the heart of thinking - and the balance is very hydrogen centric. Wider issues, e.g. heat pumps and transport, are largely covered in passing.

There are a number of specific commitments around data, e.g. control rooms, sponsorship of the open data institute and hybrid systems, and there is engagement with sector wide initiatives. But the Plan does not fully engage with other sectors and is more focused on pilots and creating networks than on credible delivery of whole systems proposals.

9.9. Digitalisation Plans

In October, NGN described investments in digitalisation in RIIO-1 (e.g. PE asset health- avoids £4m costs), £5m planned spending on IoT in collaboration with ENA. The data-driven decision making approach in the innovations section appears good, and investments seem reasonable. There is a good use of digital catapult and it is good to see early examples of engaging with SMEs. We fed back that we thought the Plan could show even more ambition in exploiting digitalisation and could do more on digital culture/capabilities. For example, NGN should develop plans to use smart meter data to improve network planning and possibly identify capacity and also opportunities to reduce gas pressures (and leakage) and reduce reinforcement expenditure.

NGN's December Plan presents what appears to be a fairly honest evaluation of its current state of affairs, and this clear diagnosis lends confidence to its Plan and its delivery. The Plan also identifies cost reductions of £2m p.a. The roadmap is welcome including elements such as customers scheduling through apps.

The vision is clear, the Plan is detailed and appears to be well understood by the business. Moreover, implementation and delivery has been proven given the cost savings already realised. Initiatives such as automated data assurance and activation of an SME network through digital catapult are welcomed. NGN appears to demonstrate competence in the overarching data infrastructure, not just those with a gas network focus. The delivery process appears very efficient compared to its peers.

9.10. Managing Uncertainty

Ofgem's requirements for uncertainty mechanism submissions require companies to set out each risk with its materiality, frequency, trigger events, and probability and to explain where the risks lie, justifying the proposed balance of risk between company and consumer.

Our October feedback to NGN noted that its Plan outlined uncertainty mechanisms which included reopeners for Streetworks, Cyber, Large Load Connections, Rail Diversions, Physical Security and Smart Metering but limited detail was provided.

Volume drivers/indexation were proposed for Tier 2a Repex, fuel poor connections, and RPE. We asked NGN to set out the potential costs associated with these and how risks have been allocated between consumers and the company.

The uncertainty mechanisms in NGN's December Plan are shown, below, and more fully described in NGN's Plan Appendix A15 which describes all risks and mitigations.

Cost Area	Value	Mechanism	Coverage
Repex	£108m p.a.	Volume driver / price control deliverable	All workload
		Re-opener - Streetworks	c.£0.6m p.a.
		Indexation for real price effects	c.75% of costs
Capex	£59m p.a.	Re-opener – Streetworks	c.£1.3m p.a.
		Re-opener – Large load connections	c.£1m p.a.
		Re-opener – Cyber security	c.£2m p.a.
		Re-opener – Trans Pennine Rail	c.£3m p.a.
		Re-opener – High speed rail	Unknown costs and liability
		Re-opener – Physical security	Unknown costs
		Indexation for real price effects	c.65% of costs
Controllable Opex	£89m p.a.	Re-opener – Streetworks	c.£0.1m p.a.
		Re-opener – Smart metering	Unknown costs
		Re-opener – Cyber security	£0.7m p.a.
		Indexation for real price effects	c.60% of costs
Non Controllable Opex	£91m p.a.	Pass through	All costs

Table 8.1

On some of the mechanisms proposed:

- NGN proposes that RPE's should be indexed and has set out the key indexes that it thinks are relevant, but it has not specified an RPE assumption. We think most of these – for example, employee costs and procurement - are within the control of the company and are already subject to its interventions to address rising cost pressures. Overall we don't think these costs should be included in any RPE indexation.
- We agree that uncertain events such as railway diversions could be treated as uncertainty mechanisms but think that large load connections should be a normal business risk for the company (and are now relatively low due to conversion of oil consumers). We would agree that new large power generation plants are uncertain and that these should be treated via uncertainty mechanisms above a certain threshold.
- Streetworks – we think a reopener is appropriate for major changes, but the thresholds proposed by NGN appear low.
- Smart metering – we think this should be a normal business risk for the company.

While the number of bespoke measures proposed is limited, which is welcome, the overall value proposed by NGN for its uncertainty mechanisms (including sector - wide mechanisms) seems high and we think this should be investigated further.

Overall, we think that NGN has provided a reasonable set of uncertainty mechanisms, justifying specific areas of expenditure that appear uncertain. We expect Ofgem to validate and assess these proposals, taking account of potential bias to the company's benefit. Where NGN's proposals are taken forward, we expect the benefits to the company of risk mitigation to feed into an overall calibration of risk/reward within the price control settlement.

9.11. Efficiency – innovation and competition

Innovation – NGN's Plan describes how previous innovations have been rolled into BAU and how the benefits are included for RIIO-2. Savings from RIIO-1 are estimated at c£0.7m pa. NGN has invested £30m of Totex funding and £10.7m of NIA funding in innovation projects so far during RIIO-1. It has successfully bid for £34.5m of funding from the NIC.

Plans for finding new innovations in RIIO-2 are outlined together with increased collaboration with stakeholders. NGN proposes to use Totex and external funding to deliver BAU innovation to achieve:

- future efficiency through modernisation of network processes, techniques and systems
- reduced impact of activities on stakeholders
- greater use of real-time data, automation and robotics
- better operational practices.

NGN has requested £11.5m of NIA funding for RIIO-2, focusing it's spend on six themes that address vulnerability and energy system transition, plus £6m of match funding. Overall, while these initiatives are welcome, we think that NGN could have been more ambitious in using innovation funding with respect to Net Zero targets. We also believe all GDNs including NGN should be better at taking forward previous innovation projects (e.g. plastic transmission pipelines).

Competition - The Business Plan does not identify any projects that are suitable for early or late competition. A description is provided about NGN's approach to native procurement with the benefits that have been delivered. The biomethane industry has made the case since 2014 for compression projects to create capacity for injection and this is an area where competitive provision could increase innovation and reduce costs.

We think that NGN could have been more proactive and identified projects suitable for competition that fell below the Ofgem criteria. With no gas in new houses from 2025, it is important that NGN seeks to enable greater competition in connections, not least to ensure that the competency provided by the 165 companies approved to carry out gas connections does not leave the gas industry with the prospect of hydrogen on the horizon.

Efficiency – NGN has made a commitment for RIIO-2 of 0.5% annual Totex cost reduction. This is expected to be achieved by a mix of efficiencies realised from new

IT systems, modern terms and conditions for the workforce, and innovation. This is claimed to produce a cumulative saving of £19m over RIIO-2.

Given the £344m of efficiency savings that NGN made over RIIO-1, we think a more ambitious target could have been set for RIIO-2.

9.12. Costs

9.12.1. Scenarios and forecasting

The NGN Plan is based on the ENA common planning assumptions.

9.12.2. Costs

Ofgem's planning guidance requires companies to justify costs, including cost drivers, consideration of options and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

In our feedback on the NGN July Draft Plan, we raised concerns that the information provided was incomplete and that the Totex forecast may be higher than necessary. We noted that engineering justifications were missing and requested further evidence to support the Plan cost forecasts, including how efficiency and innovation would be used to reduce costs in RIIO-2. On specific issues, we asked for further evidence to support increased investments in Technology systems, Transport, Repex and unit costs. We also asked for a clear description of cost drivers between RIIO-1 and RIIO-2, and some Totex sensitivities.

In our October Plan feedback, we noted that the NGN Plan proposes ongoing efficiencies to keep NGN at the cost frontier during RIIO-2 including efficiencies in direct labour, investment procurement, maintenance insourcing (reversing a prior outsourcing approach) and IT enhancements. We fed back that efficiency gains are only targeted at 0.5% which appeared unambitious. We invited NGN to provide a clear profile for mandatory and non-mandatory volumes, and associated unit costs, explaining the key changes between RIIO-1 and RIIO-2, including the efficiency gains they have realised and planned.

Also, in October, we undertook a deep dive session with NGN, exploring its approach to non-mandatory Repex, intervention techniques and how its investment and maintenance approach might take advantage of reducing gas demand.

9.12.3. Costs - the NGN December Plan

The NGN Plan proposes expenditure of £1249m of expenditure for RIIO-2 which is slightly lower than the £1261m proposed in the NGN July Plan.

We have used the cost categories reported to Ofgem in Business Plan Data Templates to assess NGN's Plan. These are shown in Table 1 below, and are consistent with the cost categories used in the NGN Plan document.

We have compared the RIIO GD-1 average (eight-year actual plus forecast) expenditures with their RIIO GD-2 five year forecast equivalents. The table also shows the percentage of Totex that each cost category represents. We have used this approach to compare GDN expenditure forecasts for RIIO-2.

For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green). The table also shows the percentage of total Totex for each expenditure line, ranging from the lowest percentages being shown as green and the highest as red.

Table 1. RIIO-1 to RIIO-2 NGN Cost Comparison

NGN	GD-1 Average	GD-2 Average	GD-2 Total	% Change	% of Totex
Direct Opex					
Work Management	17	17	84	-1%	7%
Emergency	11	10	52	-5%	4%
Repair	16	15	74	-7%	6%
Maintenance	12	17	84	46%	7%
Statutory independent undertakings (SIU)	-	-	-		
Other Direct Activities	6	4	18	-44%	1%
TOTAL DIRECT OPEX	62	63	313	1%	25%
	-	-	-		
Indirect Opex	-	-	-		
Business Support	24	23	114	-4%	9%
Training & Apprentices	2	4	18	44%	1%
TOTAL INDIRECT OPEX	26	26	132	1%	11%
	-	-	-		
Capex	-	-	-		
LTS, storage and entry	15	17	83	12%	7%
Connections	9	8	39	-14%	3%
Reinforcement (<7barg)	4	6	29	48%	2%
Governors	2	2	8	-29%	1%
Other Capex	24	19	96	-21%	8%
Transport & Plant	3	4	19	27%	2%
TOTAL CAPEX	57	55	274	-4%	22%
	-	-	-		
Repex	-	-	-		
Tier-1	69	63	316	-9%	25%
Tier-2A	3	1	4	-73%	0%
Tier-2B	7	8	42	16%	3%
Tier-3	3	7	33	134%	3%
Other Policy & Condition (inc. MDPI)	5	18	91	297%	7%
Multiple Occupancy Buildings (MOBs)	0	1	3		
Services Not Associated with Mains Replacement	9	8	42	-6%	3%
TOTAL REPEX	96	106	530	11%	42%
	-	-	-		
TOTEX	241	250	1,249	4%	100.0%

9.12.4. Costs – Our review

We would make the following overall observations from this table:

- Average Totex increases by 4% in RIIO-2.
- Direct and indirect Opex show small increases overall. Business support costs show a small reduction. Maintenance costs show a significant increase but offset by reductions elsewhere in direct Opex.
- Total Capex decreases by 4% largely due to a decrease in the ‘other Capex’ category. There are some small increases in other Capex categories.
- Repex increases by 11% driven by increases in the ‘Other policy and condition’ category and Tier 3 Repex. Tier 1 Repex shows a 9% decrease. Repex remains the highest proportion (at 42%) of the total Totex.

We have then examined some cost areas in more detail and set out our key concerns, below:

- Repex - Stub replacement. This has driven a £7.8m a year increase in Repex justified by a mandatory requirement. NGN Plans to replace all these stubs by 2032. However, we are concerned that the unit costs may be high and note NGN's Cost Confidence Annex attributed lower confidence to these costs. We would also encourage NGN to make a case to HSE that replacement of such stubs is not necessary.
- Repex – Tier 3 replacement has been increased to 10km pa, from 5km pa, due to high failure rates. This results in £4.6m pa of additional costs. However, we note that there is a pay-back period of 20 years for this investment and would question whether this represents value for money given the future expected decline in gas demand.
- Repex – Tier 2b replacement is proposed at 20km pa during RIIO-2. A payback period of 16 years is proposed. Again, we would question whether this investment is appropriate given the potential future of gas demand.
- Repex - >2" steel We note that NGN proposes a replacement programme of 30.6km pa giving a payback of around 13 years. Again we would question whether this is appropriate given the future of gas demand.
- Non-mandatory Repex – Following on from these comments, given the future demand for gas is falling, we suggest that NGN should explore opportunities to extend lives of assets where payback is less than, say, 10 years.
- Mandatory Repex – this accounts for a significant amount of expenditure through to 2032. We would like NGN, together with other GDNs, to work with the HSE to explore whether reductions can safely be made to the mandatory Repex programme during RIIO-2 and beyond.
- Capex – reinforcement. We note this is increasing significantly and would question the level of this with decreasing gas demand expected.
- Opex – maintenance costs are increasing by some £6.1m pa due to increased focus on district governors, LTS pipelines, valves and pressure control systems. There is limited justification provided for this increase and we would question why maintenance expenditure should increase from RIIO-1 levels.
- IT costs – we note that NGN's Business Plan data templates propose a total IT cost of £103m.
- Gas pressure management – We note that NGN has made provision for interruptible contracts with some customers to optimise network expenditure, and their Plan addresses how NGN might exploit lower gas pressures to reduce leakage and the need for network expenditure. We think Ofgem should review the proposed benefits from this approach.
- £16 million is proposed to upgrade gas pre heating at 50 sites. At present such gas consumed (Own Use Gas) is a pass-through cost and hence the use of heat pumps for gas pre-heating (which is a well suited technology given high temperatures are not required) is not economic. We think Ofgem should

review the incentives in this area to ensure that gas is metered and there are proper drivers to implement the most appropriate option and not just gas. This should be aligned with incentives to reduce shrinkage.

According to Ofgem's cost benchmarking report, NGN has been the frontier company for cost efficiency. We have compared the GDN Totex forecasts and note that, subject to Ofgem's benchmarking assessment, NGN appears to be at the low end of the range of proposed increases by GDNs. Nevertheless, based on our review and comparison of costs, we think that there is still potential for further efficiency improvements and for Ofgem to identify reductions in NGN's Totex forecast.

9.12.5. Our summary cost assessment

For our review of the NGN December Plan, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements. For selected areas of expenditure, we have considered NGN's justifications against the following:

- Is it needed? - The need case for the volumes of intervention, taking account of evidence such as actual asset condition, or customer requirements. While NARMS and monetised risk justifications are expected, we are also looking for corroboration from actual asset condition assessments.

  On Repex, while engineering justifications were limited initially, fuller documentation has been provided with the December Plan. We have not reviewed these in detail but they appear to provide a reasonable justification for the volumes of expenditure in the Plan. However, we believe that options for deferring expenditure have not taken into account lower gas demand and this should be reviewed as a sensitivity.

  On Opex, we note that maintenance costs have increased significantly since RIIO-1 and the justifications for such a large increase in workload are unclear, particularly given the outsourcing of LTS maintenance and its now being brought back in house. This is an area Ofgem should review to understand the business decisions associated with the LTS outsourcing and ensure that customers are not picking up costs that should fall to NGN shareholders.

- What intervention? - The type of intervention showing that options have been considered and there is an appropriate balance between risk and value for money – for example, has lower cost refurbishment been fully considered.

  To assess this, we looked at open cut versus insertion intervention techniques and are satisfied that NGN is seeking to deploy the least-cost option wherever possible. However, we have not been able to undertake benchmarking across GDNs and would expect Ofgem to examine this area further, particularly in the light of Net Zero impact on gas demand.

- Is it efficient? – This includes: are unit costs efficient? Have efficiencies and innovation benefits been built in? Are risk margins being added to project costs?

We note that NGN has undertaken a cost confidence review across all areas of expenditure with most areas having a high degree of confidence. However, significant cost areas such as stubs have a low degree of cost confidence and we have concerns that unit costs may be higher than necessary. We anticipate that Ofgem's benchmarking will help to give assurance in this area.

- Was it previously claimed under RIIO-1? – Is this an activity that appears to have been deferred from RIIO-1 and that customers have already paid for?

  NGN has significantly underspent its allowance in RIIO-1 and is seeking an increased level of Totex in RIIO-2. NGN has reported that it has targeted a costlier Tier 1 Repex in RIIO-1 and is proposing a reduced Tier 1 expenditure in RIIO-2. This is a very important area and we expect Ofgem to review the details to ensure that RIIO-1 has not used up the easier work and pushed more expensive work into RIIO-2.

The NGN Plan shows a 4% increase in Totex from RIIO-1 despite a reducing demand for gas and the changes in the general gas demand environment as a result of the Net Zero target. With no gas in new houses from 2025 and local authority decarbonisation targets (including Leeds) for 2030, it can reasonably be expected that the Capex associated with new connections and reinforcement will fall significantly.

There are other benefits from falling gas demand in terms of lower replacement, leakage and reinforcement costs and Ofgem should review these benefits to ensure they flow to customers. Increases in expenditure in policy Repex areas should be investigated further by Ofgem, in particular the benefits in terms of workforce availability from the point that new gas connections in new homes end.

We note that NGN already makes use of gas pressure management to reduce expenditure; we think this could be increased to benefit consumers. Furthermore, we think non-mandatory replacement schemes with long pay-back periods should be reconsidered and Ofgem should review this to ensure a consistent methodology is applied across the country. Ofgem should also incentivise lower-cost options where these can be accepted by the HSE (for example, not replacing stub ends).

Overall, we think that costs are reasonably well justified but we still think there are some areas for further investigation and challenge by Ofgem.

9.13. Engineering Justifications and CBA

In our feedback to NGN on its July Plan, we noted that engineering justifications and CBA information was limited. In October, more information was provided and the number of engineering justifications doubled. However, we still had concerns about the depth of evidence to support expenditure plans, especially the approach to probability of failure, iron mains replacement, and explanation of unit costs. We requested full justifications for the December Plan.

In December we found that engineering justifications had generally been enhanced and were provided for each of the key mandatory and non-mandatory expenditure areas. From the engineering justifications we have sampled, we noted that the data used in probability of failure calculations comes directly from the NARMs methodology. NGN's failure models are based on industry standard guidelines, and the failure rates have been statistically derived using actual asset information, such

as age or material, and historic failure data taking into consideration other influencing factors such as weather or temperature. The Plan includes some case studies of actual asset condition findings.

While greater justification has been provided, we remain concerned that the justifications are of a generic nature and that the results from the NARMs methodology and failure models may be subject to significant uncertainty and potential overstatement of risk. Given the limited time we have had to examine these justifications, we recommend that Ofgem examines them further. We would like to see evidence that engineering justifications are based on specific projects and use evidence of historic actual asset condition to corroborate asset health models.

CBAs have been performed for the major expenditure areas considering options against a 'do nothing' baseline. They provide a high- level summary of the risks, costs and benefits that have been included or excluded in the analysis and calculations.

The CBAs do not fully examine options for future energy scenarios with reduced gas usage, and we are concerned that investment projects with long pay-backs are being supported when deferment may be a better option for customers. Again, we would ask Ofgem to examine this area further.

9.14. Finance

We have evaluated the financeability section of NGN's Plan against adherence to Ofgem's financial Plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement with both appropriately qualified consumers and our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem's WAs.

NGN's July Plan was non-compliant with Ofgem's Business Plan Guidance in a number of respects. There was no detailed assessment of the financeability of the Actual Company and there was very little sensitivity analysis in relation to either the Notional or the Actual Company. There was no analysis of, or consumer engagement in relation to, the potential benefits for consumers either of changes to depreciation and capitalisation rates or of targeting different ratings for the Notional Company.

The October Plan was considerably improved and showed evidence of engagement with our commentary on the July Plan. Both the Actual and the Notional Companies had been modelled using Ofgem's WAs and a full suite of the sensitivities required by Ofgem presented. The Notional Company appeared to be financeable with a BBB+ rating without further mitigating measures. The Actual Company also appeared financeable, possibly with the rating dropping to BBB. Despite this, the company proposed a non-compliant 'Base Case', helpfully distinguished from the cases required by Ofgem but based on a 5% Cost of Equity allowance and a 2.4% Cost of Debt allowance (based on a 14-18 year trombone) together with a statement that 65 bps (a level which we regard as very high) debt issuance and other associated costs would be an appropriate assumption. Changes to depreciation and capitalisation rates were explicitly rejected as measures to improve financeability. Despite indications that there had been some generalised engagement with

consumers in relation to financing, there was no evidence of detailed engagement in relation to specific financing issues nor of the trade-offs (for example on gearing ratios and target credit ratings) that this implied.

The Final Plan contained an explicit statement that it was financeable on both a Notional and an Actual basis, probably at a lower (BBB) rating for the Actual Company, mainly due to the high level of gearing. NGN rejects the concept of the 0.5% outperformance wedge, so this statement is intended to apply to a case based on a 4.8% return on equity but the sensitivity analysis presented made clear that both the Notional and the Actual Company are financeable with a BBB rating on the basis of a 4.3% return on equity. The NGN proposed case is helpfully provided in a separate annex but it is based on the same Cost of Capital allowances as in November and we continue to question the need for it: the Notional Company is financeable at NGN's target rating of BBB+ without the need for mitigating actions.

We commented in November that the targeting of ratings higher than those required to achieve investment grade required detailed justification and consumer engagement. NGN continues to target a BBB+ rating but shows no evidence of consumer support for this. A 'comprehensive assessment' by Frontier Economics of the merits or otherwise of targeting lower ratings is presented in an appendix. Although this concludes that NGN should continue to target a BBB+ rating, there is no evidence of consumer support for this proposition and we continue to take the view that it requires full analysis and specific consumer support. The inclusion of the Frontier Economics report is welcome but we consider it suffered from a number of shortcomings (including limited detailed analysis of low rating cases) which detract from the validity of its conclusion that the appropriate target rating for NGN is BBB+.

The Plan includes a detailed analysis of potential measures to improve financeability. However, in the light of the fact that the Notional Company is clearly financeable without such measures, they seem to us to be targeted more at supporting NGN's proposed higher cost of capital allowances than ensuring financeability. Changes to the depreciation period are rejected on the basis of intergenerational fairness and a statement that rating agencies would look through such a change (an argument which we do not find entirely persuasive) and there is no analysis of the potential for a shorter depreciation period assumption in the light of the uncertainties surrounding the future of gas. The company points out that the changes to the within-period timing of Opex and Capex which it is proposing for technical/commercial reasons will have a beneficial effect on financeability by increasing 'fast money' to 34% of expenditure over the period. NGN has made helpful statements about the role of equity in ensuring financeability and intends to contribute £30 million of new equity to the Actual Company over the period. However, despite the fact that the Plan is financeable even with a 4.3% Cost of Equity allowance, we consider NGN could have been more ambitious in exploring financeability measures which would minimise costs for consumers.

NGN has clearly undertaken substantial engagement with consumers and describes a 50 strong 'Citizens Panel', but we could find no real evidence of detailed engagement on specific financeability issues.

NGN's Plan contains a clear statement that it is financeable with a 4.8% return on equity and there is evidence that that would also be the case at 4.3%. We regard the NGN proposed case as unnecessary and as displaying insufficient ambition to

minimise costs to the consumer. We do, however, acknowledge that it is presented as an alternative and in an entirely separate annex.

9.15. Consumer Value Proposition

The NGN CVP comprises 12 proposals in the areas of supporting customers in vulnerable circumstances, customer service, environment and stakeholder engagement. We have been impressed by the way that NGN has engaged with the concept of CVP in terms of identifying quite specific proposals and commitments which it believes deliver additional benefit to consumers. The CVP has been subject to detailed scrutiny by the CEG which has focused in particular on the level of stakeholder support for the individual proposals.

Notwithstanding apparent stakeholder and CEG support, which we welcome, we do not think that the majority of the proposals go sufficiently beyond the high standards achieved by several companies in RIIO-1, or proposed for RIIO-2, to stand out for reward. This applies, for example, to the measures to support those in vulnerable circumstances. Of the environmental initiatives we consider that the commitment to restrict company cars to hybrid and electric vehicles is a welcome initiative with customer support but not beyond what might be expected.

As regards customer service initiatives we think that benchmarking of all the GDN output proposals will help to identify whether NGN's proposals, particularly those related to complaints and restoration, are sufficiently better than others to warrant recognition. We have noted in relation to another GDN that **timed appointments** appear, from some engagement, to be something which customers value and that inclusion of it in outputs will help to ensure it becomes part of expected service going forward.

There are two elements of the CVP which seem to us to have merit but which raise issues of funding:

- **The Hardship and Community Partnership Funds** - this fund supports customers who cannot afford to repair or replace appliances after disconnection, in particular. It seems to address a very significant issue. However, we are concerned that, since support for these was in part predicated on their being shareholder- funded, a financial reward might undermine that support.
- **Proposal to Plant 40,000 trees in the Northern Forest** - this requires further investigation. Planting of deciduous trees in some locations will deliver significant biodiversity and air quality benefits. But it is not clear whether that will be the case with this initiative and again we are concerned that stakeholder support may have been conditioned by this being shareholder-funded.

Finally, with regards to **the proposal to continue with a Citizens Jury,** we welcome this but do not accept the approach that NGN has taken to quantify this benefit. We consider that this benefit may, in fact, be impossible to monetise and should be accepted by the company as an engagement and reputational benefit.

10. Company Report - SGN

10.1. Summary

The following table sets out our rating for the SGN final December Business Plan, together with the average ratings we have given SGN during their plan preparation stages.

Table 1: SGN Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms		
Outputs: vulnerable consumers			Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October Plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to Red where we thought it was poor or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December Plan ratings – our RAG ratings on the companies' final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the plan is good and the company proposals are acceptable, ranging to Red where we think the evidence provided is poor and the company proposals are not acceptable. Our explanatory comments are provided in this report.

10.2. Plan highlights

- **Costs** - SGN expects to underspend its Totex allowance by 15% (£805m) in RIIO-1. We estimate that SGN's Totex (including enhanced outputs) is forecast to increase by around 9.5% between RIIO-1 and RIIO-2, largely driven by enhanced output costs and Repex costs. SGN are forecasting a 1% pa efficiency increase and have asked for a number of bespoke uncertainty mechanisms.
- **Outputs** – Most output targets were met or exceeded in RIIO-1. SGN are proposing 32 bespoke outputs funded from their baseline Totex.
- **Financing** – SGN states that its Notional Company is financeable at a rating of BBB+ on the basis of Ofgem's Cost of Capital WAs, without the need for mitigating actions.

10.3. Track record

Ofgem's Business Plan Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs – SGN expects to meet or exceed the output targets set for them during RIIO-1. SGN Southern has not met fuel poor connections targets to date but hopes to meet this target by the end of RIIO-1.

RIIO-1 Totex – The Plan explains the transition from RIIO-1 to RIIO-2. SGN expect RIIO-1 Totex outperformance to be £805m (or 15%) below allowance of £5,319m. (After the first 6 years of RIIO-1, the outperformance was 18%). They attribute these savings to:

- 70% due to efficiencies due to an investment, process or management change.
- 12% due to risk allocation variances i.e. where a RIIO-1 forecast or expectation changed e.g. weather or economic growth.
- 18% due to business decision variances which include an element of efficiency.

SGN state that they are not expecting any work planned in RIIO-1 to be deferred for RIIO-2. However, SGN also state that they are expecting Totex to increase in the last years of RIIO-1 for Repex projects and that some of these will continue into RIIO-2. SGN say they will not be able to repeat the step change in efficiency during RIIO-2 as they have realised the one-off opportunities available such as increasing insertion rates to the maximum achievable.

RIIO-1 Returns – SGN's RORE over the RIIO-1 period is expected to be 11.1%.

10.4. Business Plan commitment and assurance

SGN's Plan contains a clear statement in the name of the Board that the Board takes collective ownership of the Plan (although individual commitment is underlined by photographs of all Board Members presented in lieu of signatures). There is an explicit confirmation from the Board that the Plan is in the interests of existing and future consumers and is accurate, unambiguous, complete, robust, ambitious and efficient. The Board statement goes on to say that 'separately' (unclear why) the Board considers the Plan to be financeable on both a notional and an actual basis under Ofgem's WAs but goes on to 'note' its views on the WAs (which are set out in the Finance Section and said there to be unacceptable). The Plan does, however, set out an assurance process for the financing arrangements in which PwC, Evercore and National Westminster Bank were all involved. The financeability of the Plan is said to have been the subject of 11 'ring-fenced' Board meetings between August and December 2019.

A process of risk based assessment leading to a four stage assurance process is well set out and a good deal of emphasis is placed on process which is described in detail (number of meetings, attendees etc.). The emphasis on process does not appear to be to the detriment of content. The internal processes appear to be well structured and the fourth stage in the process is external assurance in which PwC and Gartner were involved. A number of other external assurance specialists

(Frontier Economics, Hargreaves Jones, Arcadis, NERA and Ove Arup) were said to have been involved in assurance and to have been embedded in Plan development teams.

The Assurance Section contains a statement that the LTIP scheme for senior management has hitherto been based on financial returns and safety but that a broader set of measures, weighted 50/50 between financial and non-financial measures, customer-related and said to have been developed with stakeholder input, will be adopted for RIIO-2. The changes proposed do not relate specifically to the Plan (though they are all items contained in it) but there is a statement that the financial targets will be aligned with the outputs of the Plan once the RIIO-2 determination is confirmed.

10.5. Stakeholder engagement

SGN's Plan presents a thorough and well-articulated approach to stakeholder engagement.

The impact of stakeholder engagement on the Plan is well evidenced, trade-offs are discussed and there is evidence that this triangulation of insights has led to the Plan being changed in some areas. PwC conducted an independent assessment of SGN's stakeholder engagement approach against the AA1000SE standard and this found that there were 'no significant gaps'.

The future strategy takes a two-pronged approach: first using stakeholder engagement to improve everyday activities; and second, using it to contribute to solving 10 long-term 'complex challenges'. This is a strategic and ambitious approach, which sets out clearly how it meets the principles set out by Ofgem.

The costs of future engagement are given as £2m per annum by 2021 and the Plan says that these costs are included in the baseline. SGN says that this is 1% lower than in 2018/19 and that the Plan includes an assumption of an ongoing efficiency of an additional 1% per annum. SGN points to a number of ways to assess the impact and value for money of this investment. Importantly these include a commitment systematically to identify the impact and quantify the benefit of changes made as a result of engagement.

The engagement timetable that SGN followed meant that several key elements appeared for the first time only in the December Plan. These include the results of acceptability testing and a further independent assessment by PwC of SGN's stakeholder approach. SGN says that 85% of domestic customers in Southern and 88% in Scotland found the Plan acceptable 'before explanation'. 'After explanation', these figures rose to 86% and 92%. These results appear to be at the top end of the range.

SGN proposes one bespoke incentive in this area. It is a reputational incentive for an annual report to demonstrate progress on the 10 'long-term, complex challenges' that it has identified. We think that this strategic focus on a number of clearly articulated complex issues merits the special highlight of a reputational incentive.

10.6. Outputs

SGN have provided 32 bespoke outputs in addition to those required by the sector methodology. Most are identified as price control deliverables and one as an ODI.

Funding for outputs is included in baseline Totex in detail. Bespoke (described by SGN as 'Enhanced outputs') are identified as adding £54m to average annual Totex, or around 10%.

While we welcome Price Control Deliverables (PCD) as a way of demonstrating that outputs are being achieved, this is a considerable additional cost and we are concerned these additional outputs could have been included in existing baseline Totex and that they do not represent value for money. We would ask Ofgem teams to investigate further to ensure that these outputs are appropriately costed, targeted and offer value for money.

10.6.1. Customer Outputs

On customer service and complaints, SGN's ambition is broadly to maintain its current performance across both networks. We think this is acceptable given the good levels of performance that the company already achieves, and the fact that the new methodologies and baselines being developed may require it to raise its game in order to achieve the same results. Costs for the RIIO-2 period are given as £6.1m including an annual £0.5m investment in technology to keep pace with 'evolving customer expectations, convenience and automation'. We note that SGN originally considered but then rejected extra investment in customer liaison officers as it says this investment was not supported by customers.

The proposed target for the average restoration time for unplanned interruptions is the same as the company's average performance over the last three years. SGN also proposes adding a further 9.5 and 3.3 hours to these targets in Scotland and Southern respectively to take account of the inclusion of large events. This results in overall targets of 21.9 and 26.3 hours. The ambition level in these proposals seemed modest. Given that we found it difficult to judge targets for all companies in this area, we would suggest that it would be a useful area of focus for GDNs at the open hearings.

SGN also proposes a bespoke financial incentive for 'social value collaboration'. The core idea is to achieve a step change in cross-company collaboration in order to achieve an overall reduction in the duration of works, and to use the social value tool to assess the benefit of this to consumers and communities. This incentive is supported by SGN's CEG, and we think that the content of this initiative is well thought through and ambitious, proposing as it does to drive practical and cultural change not only in SGN but also across the industry. SGN proposes a £4.5m cap for the incentive to protect consumers from over-performance. We believe this incentive has merit – but would suggest that Ofgem explores further at the Open Hearings whether the specific assumptions around costs, returns and the social benefits assumed by SGN's tool are reasonable.

10.6.2. Vulnerability

Overall SGN's Plan proposes only incremental improvement in service provision to its customers in vulnerable situations. Nonetheless, it is a well-articulated and evidenced Plan. We consider proposals in this area to be solid and an evolution on existing service provision, with a moderate level of ambition that demonstrates a sound understanding of vulnerability and how a network company can help its customers. The highlight of the proposals is to help 250,000 vulnerable consumers to use energy safely, efficiently and affordably.

Proposals in these areas have been further developed and refined following challenges from the CEG and stakeholders, although the CEG notes that in-depth support for people who SGN identifies as being in greatest need remains relatively limited at 1,500 people per year. In the October Draft Plan submission, we noted several points of improvement since the summer, and there have been a few incremental changes in the final Plan. In October we thought the consumer vulnerability and carbon monoxide safety use-it-or-lose-it allowance area stood out as a well-evidenced and justified area and had responded to challenges raised by the CEG. We noted that SGN's ambition on FPNES had increased since July, but that, overall, the level of ambition still sits below RIIO-1 levels. SGN responded to our challenge to say that this reflected a realistic level considering the amount of funding available to treat homes and the more stringent targeting criteria. SGN's level of delivery for FPNES remains closer to RIIO-1 levels than proposals from other GDNs.

10.6.3. Resilience outputs

Asset resilience

SGN's draft Plans provided reasonable levels of detail on asset resilience plans. The December Plan sets out SGN's asset management strategy including the application of Network Asset Risk Metrics (NARMs). Engineering Justification Papers (EJPs) and Cost Benefit Analyses (CBAs) supported by engineering judgement interventions. Projects above £500k are assessed using these tools. SGN is seeking to apply network output measures to distribution as well as transmission assets.

While the Plan appears comprehensive, we are not certain that SGN's CBAs fully demonstrate that the selected investment options deliver sufficient net benefit for existing and future consumers, particularly where there are long payback periods. Our concern relates to the level of present and future gas demand. The SGN Network Innovation Competition (NIC) project "Real Time Networks" potentially indicates a significant fall in peak gas demand which may be expected to continue as a result of Net Zero heat initiatives.

Given the expected future decline in gas demand, we think there may be further options that could be explored to reduce investments with long payback periods.

Workforce Planning

SGN has around 3,900 directly employed staff and this is proposed to be continued for RIIO-2. SGN's Business Plan provides a good description of how it will develop a modern, diverse, high quality, well-trained workforce fit for the future. SGN propose to keep employment costs under review during RIIO-2. Staff churn of around 10% pa is expected.

However, we note that the workforce is competent for today's business, which is focused on mains replacement and escapes and is not necessarily ready for a hydrogen future, which potentially invests significantly in new assets with high technical content. For example, the number of Chartered Engineers will likely need to be increased in the future if the hydrogen pathway is taken.

Cyber Resilience

The SGN Business Plan provides a good description of a Business IT security plan (£18.1m) and an incremental Cyber Resilience Plan (£4.2m) in response to the Network and Information Systems Regulations 2018.

10.6.4. Environment

The environmental approach has developed over successive iterations of the Plan, and in particular shows a good response to our challenge on the October Draft Plan. There is evidence of good engagement with the CEG and other stakeholders, including development of a wider sustainability strategy aligned with the UN SDGs and a commitment to net zero by 2045, corresponding to the Scottish Government target. The proposal for an Independent Steering Group for Environmental Action, to provide challenge on investment decisions and the appropriate balance between ambition and cost-efficiency shows commitment to continued stakeholder engagement in this area. The Business Plan contains quite extensive narrative of existing initiatives and while it is sometimes difficult to identify precise outputs amongst this detail, they are brought together in Table 10.1 in the main Plan.

The EAP shows considerable work and some genuine ambition on avoidable waste, biodiversity and business carbon reduction. There is extensive coverage of contribution to low-carbon transition, in particular in relation to hydrogen and biomethane, in both the Business Plan and the EAP, albeit that some of the Business Plan discussion appears to relate to RIIO-1 initiatives. The Plan shows good understanding of, and commitment to acting on, climate adaptation. While the Plan shows understanding and analysis of the issues around moving to reduce the carbon footprint of HGVs it is not clear that this translates fully into commitments and some other companies have been more ambitious on scope 1 and 2 reductions within the RIIO-2 period.

10.6.5. Bespoke outputs

SGN has one bespoke reputational ODI for biomethane deployment, which supports their target of an increase in biomethane capacity over the RIIO-2 period. This seems a clear ODI in an area where an additional output target may helpfully incentivise at the margin, but outcome will depend on the feedstock being available.

10.7. Net Zero/Whole System

There is some good material in the Plan and work to look at cross sector approaches. But there is not as yet a comprehensive or equally weighted assessment across the full range of scenarios for decarbonising heat, and the focus is very gas centred.

That said, compared to other companies there is a detailed analysis of steps to a low carbon future, e.g. with regard to billing and to hydrogen storage. While it is not entirely clear how their plans for 100% hydrogen (including a very welcome pilot) and biomethane with hydrogen injection dovetail, both are covered. Furthermore, there is more than cursory treatment of transport, waste, electrolysis/system balancing and peaking plants. Finally, there is recognition of the use of gas to support DNOs, a general commitment to consider how best to use cross-network capacity, analysis of third sectors such as agriculture and a whole system chart; and a feasibility study on whole system planning tools; operational and real time information sharing protocols.

SGN's proposed pilot projects appear to be genuinely new and would add to the knowledge base for decisions on future of gas network/decarbonising heat.

10.8. Digitalisation plans

We have fed back to SGN for them to consider plans to use smart meter data to improve network planning and possibly identify capacity and also opportunities to reduce gas pressures (and leakage) and reduce booking of NTS offtake capacity.

SGN's December Business Plan appears quite generic in approach e.g. Open Data, ENA collaboration, and adoption of EDTF, rather than company specific. However, there are some examples of SGN using data, e.g. road works app, and experiences with Transport for London (TfL) and various municipalities. SGN say their Plan will be updated continually which is welcome.

Overall, collaboration and engagement is considered but could go further in engaging with disruptors and SME's. SGN appear to be requesting more innovation funding and additional tech roll out funding in this area than the other networks, but without providing better justification of where they are today versus where they need to be. For example, a £5m funding claim to connect to smart meter data does not indicate the potential benefit - we would like to see a link to the learning from the NIC project "Real Time Networks".

10.9. Managing Uncertainty

Our October feedback to SGN noted that their Plan outlined uncertainty mechanisms which included volume drivers and reopeners' for Repex and Capex and reopeners for policy changes e.g. heat policy, HSE, cyber, legislation. We asked SGN to set out the potential costs associated with these and how risks have been allocated between consumers and the company.

The uncertainty mechanisms in SGN's December Plan, totalling some £121m pa (with £38m already included in Totex) are summarised below:

- Ofgem proposed sector volume driver Uncertainty Mechanism (UM) for tier 2a, totalling £2.2m pa (incl. in Totex) and smart meters (undefined).
- Bespoke Use It or Lose It (UIOLI) UMs for tier 1 iron stubs and process safety, and environmental action plan, totalling £12.1m pa (incl. in Totex).
- Bespoke volume driver UM's for <2" steel, new connections, below 2 bar reinforcement, totalling £23.6m pa (incl. in Totex).
- Bespoke reopener UMs for greater than 2 bar reinforcement, street works and biomethane, physical and cyber resilience, energy system transition (including H2 network preparation) and fuel poor network extension, totalling £83.5m.
- The Plan also notes Ofgem's proposed sector UMs for HSE, heat, whole system changes, and other legislative change (undefined).

We are concerned that there are some significant costs assumed in SGN's uncertainty mechanisms which should perhaps have a greater proportion included in baseline Totex – for example, Tier 1 iron stubs are included in uncertainty mechanisms awaiting HSE decisions. We also note that bespoke mechanisms for process safety and EAP are included as uncertainty mechanisms, when we think

these should be normal business risks for the company and included in baseline Totex.

We think that connections should be a normal business risk for the company, but recognise that there may need to be an uncertainty mechanism above an appropriate threshold e.g. for new gas power stations.

SGN also propose to reduce the threshold for reopeners from 1% of allowed revenue to 0.5%, with an overarching threshold of 1% on allowed revenue for combined reopeners. With regard to iron stubs, SGN are in discussions with the HSE to defer work on 65% of stubs post RIIO-2.

RPE - SGN forecast real price effects to be just above 1% pa above CPIH. Direct labour costs make up 23% of expenditure and 43% is contract labour, with 31% being materials, mainly PE plastic pipe. SGN have based their claim for an increase on a number of sector indices. We consider that SGN is able to manage most of these costs and do not think there is sufficient justification for them to be included in RPE indexation.

Overall, we think that SGN's uncertainty mechanisms have an undue bias to mitigating what we would consider to be normal business risk for the company and placing these risks on consumers. We expect Ofgem to validate and assess these proposals, taking account of potential bias to the company's benefit. Where SGN's proposals are taken forward, we expect the benefits to the company of risk mitigation to feed into an overall calibration of risk/reward within the price control settlement.

10.10. Efficiency – innovation and competition

Innovation - SGN's Plan describes how previous innovations have been rolled into BAU and how the benefits are included for RIIO-2. Savings from RIIO-1 are estimated at £125m from 137 projects with 122 delivering some benefit to date from an initial expenditure of £24.9m.

Plans for funding new innovations in RIIO-2 are outlined together with increased collaboration with stakeholders. SGN propose the following all subject to the final price control settlement:

- BAU funding by SGN of up to £1.5m pa for projects that payback within RIIO-2. However, this figure is only likely to be realisable for the first year or two given the payback conditionality.
- NIA funding, where 67 projects have been identified, focusing on early TRL innovation, energy system transition and vulnerable customers. SGN have indicated they might fund 10% of these costs contingent on their view of the risk and return in the price control settlement. NIA funding is anticipated to be c£50m for energy system transition and c£15m for vulnerable customer/low TRL projects. This NIA total of £65m is around 2% of Totex.
- NIC energy system transition – an average of £23m pa is proposed

Overall, while these initiatives are welcome, we note that the conditions placed on these funding mechanisms may mean that little or none of this innovation expenditure may take place. We also believe all GDNs including SGN should be better at taking forward previous innovation projects (e.g. plastic transmission pipelines).

Competition - The Business Plan does not identify any projects that are suitable for early or late competition. A description is provided about SGN's approach to native procurement with the benefits that have been delivered.

The biomethane industry has made the case since 2014 for compression projects to create capacity for injection and this is an area that we think Ofgem should explore for competitive provision to increase innovation and reduce costs. We note the SGN proposal on compression to create capacity but are not convinced this needs to be treated as innovation as it is technically straightforward and widely used in the EU. We would like to see the implementation of projects rather than further pilots.

We think that SGN could have been more proactive and identified projects suitable for competition that fell below the Ofgem criteria. With clean gas only in new houses from 2025 (and 2024 in Scotland) it is important that SGN seeks to enable greater competition in connections, not least to ensure that the competency provided by the 165 companies approved to carry out gas connections does not leave the gas industry with the prospect of hydrogen on the horizon. SGN could aim to use this resource to reduce the cost of Repex resources.

Efficiency/productivity - SGN has made a commitment for RIIO-2 of 1.0% annual Totex cost reduction to be generated through productivity and efficiency. This equates to 1.4% a year on Opex, 0.7% on Capex and Repex. This is claimed to produce a cumulative saving of £76m over RIIO-2.

Given the £800m of efficiency savings that SGN made over RIIO-1, we think a more ambitious target could have been set for RIIO-2.

10.11. Costs

10.11.1. Scenarios and forecasting

The SGN Plan has been based on the ENA common scenarios and has assessed each of the assumptions with the latest Future Energy Scenario (FES) plus SGN's own scenario assumptions. SGN points out that 95% of investment is associated with operational integrity and 5% with connections. Peak demand is assumed to remain at high levels. SGN investment plans seek to address the potential from declining use of gas through uncertainty mechanisms. SGN has also requested a reopener UM for new connections.

SGN have assessed the potential for low regrets zero carbon pathway expenditure, e.g. adoption of hydrogen sensors and hydrogen valves, and found the potential benefits did not outweigh the costs of action today and the uncertainty associated with realising those benefits in the future.

10.11.2. Costs

Ofgem's Business Plan Guidance requires companies to justify costs, including cost drivers, consideration of options, and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

In our feedback to SGN on their July Plan, we expressed our concern that their cost forecasts were higher than necessary. We asked for detailed CBA justifications to explain all non-mandatory works. We also asked for evidence that the proposed NARM output targets were appropriate for asset replacement expenditure.

We also asked SGN to justify their proposed Totex increase of around £100m pa to improve safety and reliability given that a high standard of safety and reliability was being delivered already.

In particular, they did not appear to take due account of the declining demand for gas in their expenditure justifications.

SGN's July Plan proposed investment in additional expenditure (compared to RIIO-1) for customer outputs of some £152m pa (of which £24m was considered to be high confidence). This investment included Capex, Repex and Opex for measures such as cyber security, risers, non-mandatory replacement, additional environmental measures and smart meter costs. We invited SGN to provide justification for this expenditure in RIIO-2 as we considered there was no compelling case set out for any of this expenditure, nor the options they have considered. We asked that in each case, the consequences in the RIIO-2 period of not making the investment should be identified.

In our October feedback we noted that SGN's Totex forecast had increased from July, and that the proposed efficiency reduction appeared unambitious. We asked for a breakdown of evidence to support volume and cost increase across Capex and Repex, and a justification of business support cost increases.

10.11.3. Costs - the SGN Plan

The SGN Plan proposes expenditure of £3058m of expenditure for RIIO-2, which is higher than the £2930m proposed in the SGN July Plan. The following table from the SGN Plan sets out their proposed Totex breakdown, including the enhanced output expenditure they have proposed to include in their baseline Plan.

Table 16-3 SGN totex summary

SGN (£m 2018/19 prices)	GD1 first 6 years	GD1 last 3 years	GD2 underlying	GD2 enhanced outputs	GD2 data templates
LTS, storage and entry	38	40	52	0	52
Connections	20	21	20	0	20
Mains reinforcement	8	12	9	4	13
Governors (replacement)	9	9	11	0	11
Other capex	39	36	27	18	45
of which IT	14	10	4	12	15
of which vehicles	8	5	7	4	12
TOTAL CAPEX	**115**	**118**	**120**	**22**	**143**
HSE driven mains and services	188	187	193	13	205
Non-HSE driven mains and services	42	66	34	5	39
Risers	14	17	17	0	17
Other repex (emerging asset issues)	0	0	0	2	2
TOTAL REPEX	**244**	**270**	**244**	**19**	**263**
Work management	37	38	36	1	37
Holders and land	10	9	6	0	6
Emergency	23	24	23	0	23
Smart metering interventions	0	2	2	2	4
Repair	30	28	25	0	25
Maintenance	29	30	31	5	36
SIUs	10	7	7	0	7
Other direct acts	4	4	5	1	6
Business support	21	26	25	1	26
IT	15	21	22	2	24
Training and apprentices	10	7	11	0	11
TOTAL CONTROLLABLE OPEX (excl Xoserve	**189**	**196**	**193**	**13**	**206**
TOTAL CONTROLLABLE TOTEX (excl Xoserve)	**548**	**584**	**557**	**54**	**612**
Reclassification of Xoserve	13	6	6	0	6
TOTAL CONTROLLABLE TOTEX	**561**	**590**	**563**	**54**	**618**

Notes
1. *Xoserve was part of controllable totex in GD1 but has been reclassified as pass through in GD2*
2. *GD2 excludes any new RPEs*

We have used the cost categories reported to Ofgem in Business Plan Data Templates to assess SGN's Plan. These are shown in Table 1 below and appear generally consistent with the cost categories used in the SGN Plan document.

We have compared RIIO-1 average (eight-year actual plus forecast) expenditures with their RIIO-2 five year forecast equivalents. The table also shows the percentage of Totex that each cost category represents. We have used this approach to compare GDN expenditure forecasts for RIIO-2.

For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green). The table also shows the percentage of total Totex for each expenditure line, ranging from the lowest percentages being shown as green and the highest as red.

The table shows the data provided to Ofgem in the Business Plan Data Templates both for RIIO-1 and RIIO-2. However, we note that there appeared to be a difference in the data tables in the classification of Xoserve costs between RIIO-1 and RIIO-2. We have included an estimated correction in a note below our table and would ask Ofgem to examine this reconciliation further to ensure accuracy.

Table 1. RIIO-1 to RIIO-2 SGN Cost Comparison

SGN Combined totex	Unit	GD-1 Average	GD-2 Average	GD-2 Total	% Change	% of totex
Direct Opex						
Work Management	£m	46	43	215	-6%	7%
Emergency	£m	24	27	136	14%	4%
Repair	£m	29	25	126	-13%	4%
Maintenance	£m	30	36	182	23%	6%
Statutory independent undertakings (SIU)	£m	10	7	33	-31%	1%
Other Direct Activities	£m	12	6	29	-52%	1%
TOTAL DIRECT OPEX	£m	150	144	721	-4%	24%
		-	-	-		
Indirect Opex		-	-	-		
Business Support	£m	39	51	254	31%	8%
Training & Apprentices	£m	9	11	53	20%	2%
TOTAL INDIRECT OPEX	£m	48	61	306	29%	10%
		-	-	-		
Capex		-	-	-		
LTS, storage and entry	£m	36	52	262	44%	9%
Connections	£m	20	20	100	-1%	3%
Reinforcement (<7barg)	£m	9	13	67	43%	2%
Governors	£m	9	11	57	26%	2%
Other Capex	£m	33	34	168	1%	5%
Transport & Plant	£m	7	12	59	60%	2%
TOTAL CAPEX	£m	116	143	713	23%	23%
		-	-	-		
Repex		-	-	-		
Tier-1	£m	184	201	1,006	9%	33%
Tier-2A	£m	4	3	13	-35%	0%
Tier-2B	£m	13	7	34	-50%	1%
Tier-3	£m	9	4	22	-52%	1%
Other Policy & Condition (inc. MDPI)	£m	7	13	64	87%	2%
Multiple Occupancy Buildings (MOBs)	£m	15	17	87	19%	3%
Services Not Associated with Mains Replacement	£m	19	18	90	-5%	3%
TOTAL REPEX	£m	251	263	1,317	5%	43%
		-	-	-		
TOTEX	£m	564	612	3,058	8.4%	100%

Totex including GD-2 Xoserve	564	618	9.5%
Totex less £54m enhanced outputs	564	563	-0.2%

The above table shows the combined SGN Scottish and Southern licensees. The separate licensee comparisons show similar results – however, overall Totex increases for Scotland are around 12% and Southern around 7% as shown in Tables 2 and 3 below, before the Xoserve correction is taken into account.

The main difference between Scotland and Southern is that Capex is higher, in Scotland, primarily attributable to LTS, storage and entry.

Table 2. RIIO-1 to RIIO-2 SGN Southern Cost Comparison

Southern	Unit	GD-1 Average	GD-2 Average	GD-2 Total	% Change	% of Totex
TOTAL DIRECT OPEX	£m	98	93	466	-5%	23%
TOTAL INDIRECT OPEX	£m	31	40	199	28%	10%
TOTAL CAPEX	£m	69	81	407	18%	20%
TOTAL REPEX	£m	188	198	988	5%	48%
TOTEX	£m	386	412	2,060	7%	100%

Table 3 RIIO-1 to RIIO-2 SGN Scotland Cost Comparison

Scotland	Unit	GD-1 Average	GD-2 Average	GD-2 Total	% Change	% of Totex
TOTAL DIRECT OPEX	£m	52	51	255	-2%	26%
TOTAL INDIRECT OPEX	£m	17	21	107	29%	11%
TOTAL CAPEX	£m	47	61	306	31%	31%
TOTAL REPEX	£m	63	66	329	5%	33%
TOTEX	£m	178	200	998	12%	100%

10.11.4. Costs – Our review

We would make the following overall observations from the consolidated SGN table:

- Average Totex increases by 9.5% for RIIO-2, including enhanced output costs of £54m p.a. and Xoserve costs.
- Direct Opex shows a small decrease overall but maintenance costs increase by 23% and emergency costs increase by 14%, both of which we think should be examined further.
- Indirect Opex increases by 29% largely due to a 31% increase in business support costs which also seems high.
- Total Capex increases by 23% largely due to increases in LTS, storage and entry and <7bar reinforcement. Transport and plant costs increase by 60%. The vehicle cost seems very high – we suggest it may be worth extending diesel vehicle lives until electric replacements are available.
- Repex increases by 5% driven by increases in the 'Other policy and condition' category, and Tier 1 Repex. Repex remains the highest proportion (at 43%) of the total Totex.

We have then examined some cost areas in more detail and set out our key concerns below:

- Repex bespoke outputs have resulted in about £20m pa, including Tier 1 replacement, which has been accelerated by 40km pa at a cost of £9.8m pa. The following table sets out the other proposed bespoke outputs. However, we note that there are long payback periods for these additional investments and would question whether this represents value for money given the future expected decline in gas demand.

Bespoke Outputs										
7.5.1	Accelerated tier 1 mains replacement	PCD						40km	9.8	4.01
7.5.2	Proactive steel mains replacement	NARMs						32km	4.6	4.04
7.5.3	Tier 1 iron stubs	PCD	12.2.3					211 stubs	1.7	4.04
7.5.4	Intermediate pressure services	NARMs						103 sites	0.7	4.07
7.5.5	Kings Ferry and Cams Hall	NARMs						Named projects	1.3	4.04
7.5.6	Responsible demolition	PCD						4 sites	1.0	2.04
7.5.7	Record keeping (MOBs) >6 storey	PCD						6,500 sites	0.5	2.04
7.5.8	Additional riser inspections: <6 storey buildings	PCD						25.5k sites	3.8	2.04
7.5.9	Riser isolation valves inspection	PCD						135 valves	0.0	-
7.5.10	Record keeping other records	PCD						2 external audits	0.0	2.01
	NTS exit	ODI		Under discussion with Ofgem						

- Non-mandatory Repex – following on from the above comments, given the future demand for gas is falling, we suggest that SGN should explore opportunities to extend lives of assets where payback is less than say 10 years.
- Tier 1 iron stubs - we note that SGN is in discussion with the Health & Safety Executive (HSE) (with other GDN's) to ascertain the best approach to managing these stubs which may reduce the potential workload as a result. We would ask the Ofgem team to investigate further.
- Mandatory Repex – this accounts for a significant amount of expenditure through to 2032. We would like SGN, together with other GDN's to work with the HSE to explore whether reductions can safely be made to the mandatory Repex programme during RIIO-2 and beyond. This would take into account the experience from 2002 to date, the statistics on escapes and incidents that have harmed members of the public and the cost per tonnes of carbon saved from reduced methane leakage.
- Opex – maintenance costs are increasing. There is limited justification provided for this increase and we would question why maintenance expenditure should increase from RIIO-1 levels. Business support costs have increased significantly without justification. Again we would question why this should increase above RIIO-1 levels.
- IT costs – the SGN plan states that £255m of expenditure is planned for IT. We think this figure is high and should be investigated further to see if this is needed and whether it offers value for money.
- We understand that investment is proposed to upgrade gas pre-heating at a number of sites. At present such gas consumed (Own Use Gas) is a pass through cost and hence the use of heat pumps for gas pre-heating (which is a well suited technology given high temperatures are not required) is not economic. We think Ofgem should review the incentives in this area to ensure that gas is metered and there are proper drivers to implement the most appropriate option and not just gas. This should be aligned with incentives to reduce shrinkage.

10.11.5. Enhanced service options

The following table sets out SGN's descriptions of the enhanced service options it has included in its baseline Plan. These are presented as 'the enhanced service outputs developed with customers to deliver additional outcomes aligned to their priorities'. It is unclear how these costs reconcile with the costs SGN has included elsewhere in Totex and we are concerned there may be duplication.

While the CEG report says that they have scrutinised the need for the various outputs that underpin the Totex forecasts and believe they reflect customer needs and wants, the CEG also says that Totex has not been their primary focus. The CEG also says they are not looking for significant additional spend on safety and reliability but they have supported acceleration of the Repex programme.

While we have been unable to examine these costs in detail, we do not consider that these costs and outputs have been justified as additional to business as usual and should be not included as additional to baseline Totex. They should form part of the

Ofgem Totex and output benchmarking assessment to determine if they offer value for money.

Table 16-6 Enhanced service options

Enhanced outputs	Capex	Repex	Opex	Totex	Positive impact	Safe and efficient	Shared future
Cyber	2.9	-	1.5	4.5			X
IT technology readiness	2.0	-	0.3	2.3			X
Open data / whole systems / capacity mapping	0.8	-	0.3	1.1			X
DCC membership	1.0	-	0.1	1.1			X
Riser surveys	-	-	3.8	3.8		X	
Responsible demolition	-	-	1.0	1.0		X	
Maintenance opportunities (bio gas maintenance)	-	-	0.2	0.2			X
Smart meter interventions	-	-	2.3	2.3	X		
Vulnerable customer allowance	-	-	1.2	1.2	X		
Accelerated tier 1	-	9.8	-	9.8			X
Stubs	-	1.7	-	1.7		X	
Kings Ferry / Cams Hall	-	1.3	-	1.3		X	
Intermediate pressure configurations	-	0.7	-	0.7		X	
Hazardous waste	-	1.3	-	1.3			X
Proactive steel	-	4.6	-	4.6	X		
Pressure management rollout	-	-	-	-			X
Growth - additional base for volume driver	4.2	-	-	4.2	X		
LAEP officers	-	-	0.6	0.6			X
Environmental personnel	-	-	0.4	0.4			X
Reduced leakage project	0.7	-	-	0.7			X
Fleet	4.3	-	-	4.3			X
Renewable energy - occupied/operational	0.3	-	-	0.3			X
Renewable energy - maintenance sites	0.7	-	-	0.7			X
Energy utility reduction	0.3	-	-	0.3			X
Biomethane	0.5	-	0.1	0.6			X
Supply chain / embedded carbon	-	-	0.2	0.2			X
Biodiversity	0.5	-	0.4	0.9			X
Climate change adaption	2.0	-	0.1	2.1			X
Innovation rollout - stent/HVGE	0.4	-	-	0.4			X
Roll out of biomethane/pressure management	2.0	-	-	2.0			X
Record keeping other records	-	-	0.0	0.0		X	
Enhanced outputs	**22.5**	**19.4**	**12.6**	**54.5**	**12.2**	**8.6**	**33.6**

In order to evaluate these costs, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements. For selected areas of expenditure, we have considered SGN's justifications against the following:

- Is it needed? - The need case for the volumes of intervention, taking account of evidence such as actual asset condition, or customer requirements. While NARMS and monetised risk justifications are expected, we are also looking for corroboration from actual asset condition assessments.

  On Repex, while engineering justifications were limited initially, fuller documentation has been provided with the December Plan. We note that SGN has evaluated their expenditure on a project by project basis. We have not reviewed these justifications in detail, but they appear to provide a reasonable justification for the volumes of expenditure in the plan. However, we believe that options for deferring expenditure should have been considered given decreasing future gas demand and this should be reviewed further.

- What intervention? - The type of intervention showing that options have been considered and there is an appropriate balance between risk and value for money e.g. has lower cost refurbishment been fully considered

  We note that SGN appears to fully consider refurbishment options to renewal (their 4R approach). We have also looked at open cut versus insertion intervention techniques and are satisfied that SGN is seeking to deploy the least cost option wherever possible.

- Is it efficient? – are unit costs efficient? Have efficiencies and innovation benefits been built in? Are risk margins being added to project costs?

  We note that SGN's overall Totex increase is higher than that of any other GDN and higher than the frontier companies. While CBAs are based on market evidence, we think additional independent cost benchmarking could have been provided. We have not been able to undertake detailed cost benchmarking across GDNs and would expect Ofgem to examine this area further.

- Was it previously claimed under RIIO-1? – Is this an activity that appears to have been deferred from RIIO-1 and that customers have already paid for?

  SGN has significantly underspent its allowance in RIIO-1 and is seeking a 9.5% increase in Totex in RIIO-2. They claim that expenditure has not been deferred. SGN claims it is increasing costs in RIIO-2 due to enhanced customer requirements but we are concerned that some of this may essentially be business as usual deferred expenditure. This is a very important area and we expect Ofgem will review the details to ensure that RIIO-1 has not used up the easier work and pushed more expensive work into RIIO-2

Cost comparisons - SGN appears to be seeking the highest Totex increase of all GDN's for RIIO-2, and subject to Ofgem's benchmarking assessment, we are concerned that SGN's costs appear to be increasing more than its peers.

10.11.6. Cost summary

The SGN Plan shows an overall 9.5% increase in Totex from RIIO-1 despite an expected reducing demand for gas. With no gas in new houses from 2025 (2024 in Scotland) and some local authorities setting decarbonisation targets for 2030 it can reasonably be expected that the Capex associated with new connections and reinforcement will fall significantly.

There are other benefits from falling gas demand in terms of lower replacement, leakage and reinforcement costs and Ofgem should review these benefits flow to customers. Increases in expenditure in policy Repex areas should be investigated further by Ofgem, in particular the benefits in terms of workforce availability from the end of new gas connections in new homes. This may be significant in the Southern Gas Networks area which has the most new houses and the highest pressure on labour costs.

SGN's Plan includes output enhancements that account for 10% of the Totex increase. We are not clear that these represent additional benefits to consumers

compared to the baseline without them and this is an area Ofgem should review in detail (taking into account the other GDNs).

Furthermore, we think non-mandatory replacement schemes with long payback periods should be reconsidered and Ofgem should review this to ensure a consistent methodology is applied across the country. Ofgem should also incentivise lower cost options where these can be accepted by the HSE (e.g. not replacing stub ends).

Overall we think that Totex costs are higher than other GDNs, subject to Ofgem benchmarking assessment and review of what is included in the baseline. We have identified areas that we think Ofgem should review in order to ensure that the costs are appropriate.

10.12. Engineering Justifications and CBA

In our feedback to SGN on their July Plan, we noted that engineering justifications and CBA information were limited. In October, much more information was provided - we requested full justifications for the December Plan. In October we asked, given the SGN Real Time Networks project has indicated 40% reduction in peak demand, what impact on proposed expenditure would there be? SGN have responded and said ‘this result will require validation however by a full year of training with all feeds from all datasets’. SGN note that they have responded through uncertainty mechanisms to address such potential reductions. We would like to see the results of this work feed into the price controls.

In December we found that engineering justifications had generally been enhanced and were provided for each of the key mandatory and non-mandatory expenditure areas and CBAs were provided for all projects above £500k in value. CBAs have been performed for the major expenditure areas considering options against a do nothing baseline. They provide a high level summary of the risks, costs and benefits that have been included or excluded in the analysis and calculations. While SGN have based their estimates on market evidence, we think they could have included further independent evidence.

The CBAs do not fully examine options for future energy scenarios with reduced gas usage and we are concerned that investment projects with long paybacks (as shown below) are being supported when deferment may be a better option for customers. The EJ’s and paybacks are summarised below. We are concerned that the long non-mandatory Repex paybacks may lead to stranded assets.

Table 17-1 Repex investment appraisals

Network	Asset	Repex (£m)	NPV (£m)	Payback (yrs)	Engineering Justification Paper
Southern	Tier 1 Iron	715	244	28	SGN Repex - 001 Tier 1So - EJP Dec19
Scotland	Tier 1 Iron	240	3	39	SGN Repex - 002 Tier 1Sc - EJP Dec19
Southern	Tier 2 Iron	24	76	23	SGN Repex - 003 Tier 2So - EJP Dec19
Scotland	Tier 2 Iron	10	17	25	SGN Repex - 004 Tier 2So - EJP Dec19
Southern	Tier 3 Iron	15	131	8	SGN Repex - 005 Tier 3So - EJP Dec19
Scotland	Tier 3 Iron	7	10	22	SGN Repex - 006 Tier 3So - EJP Dec19
Southern	>2" Steel + Iron >30m	32	51	30	SGN Repex - 007 SteelSo - EJP Dec19
Scotland	>2" Steel + Iron >30m	7	22	13	SGN Repex - 008 SteelSo - EJP Dec19
Southern	Riser	73	14	32	SGN Repex - 009 RisersSo - EJP Dec19
Scotland	Riser	14	56	12	SGN Repex - 010 RisersSo - EJP Dec19
Southern	Kings Ferry Bridge	5	5	12	SGN Repex - 011 Kings FerrySo - EJP Dec19
Southern	Cams Hall Tunnel	1	1	12	SGN Repex - 012 Cams HallSo - EJP Dec19
Scotland	IP Service Reconfiguration	4	0.2	26	SGN Repex - 013 IP ServiceSo - EJP Dec19
Southern	Bulk service renewals	5	1.3	25	SGN Repex - 014 Bulk Services So - EJP Dec19
Scotland	Bulk service renewals	2	0.3	29	SGN Repex - 014 Bulk Services Sc - EJP Dec19
Grand total		**1,154**	**631**		

Given the limited time we have had to examine these justifications, we will rely on the further examination by the Ofgem teams to examine SGN's engineering justifications and their evidence of historic actual asset condition to corroborate asset health models.

10.13. Finance

We have evaluated the financeability section of SGN's Plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement both with appropriately qualified consumers and with our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem's WAs.

We considered SGN's July Plan to be non-compliant with Ofgem's Business Plan Guidance in a number of respects: analysis of both the Notional and the Actual Company was incomplete (for example in relation to sensitivity analysis). The Plan targeted a BAA1/A3 rating with no indication as to the reasons for targeting ratings so much higher than those required for investment grade. There was no evidence of detailed consumer engagement in relation to individual key elements relating to financeability.

The October Plan was considerably improved and showed evidence of engagement with our commentary on the July Plan, in particular in relation to Ofgem's Business Plan Guidance with which it was largely compliant: both the Notional and the Actual Companies had been modelled and the full suite of sensitivities required by Ofgem presented. The Notional Company appeared financeable based on a 4.8% equity return although both the Notional and the Actual Company were said not to be. For both the Notional and the Actual companies we considered there had been insufficient exploration of mitigating measures other than a higher Cost of Equity allowance. The non-compliant SGN case was clearly distinguished from the Ofgem required cases. It was, however, based on a very much higher Cost of Equity allowance (6.5% real CPIH at 60% notional gearing) and a longer trombone (15-20 years) on the Cost of Debt allowance than Ofgem's WAs. We commented that the difficulties with the financeability of the Actual Company appeared to be driven by

unnecessarily high levels of gearing. There was some evidence of consumer engagement but largely limited to high level questions on intergenerational equity. The company failed to address the question of shorter depreciation periods in the context of the future of the gas sector.

The December Plan showed further improvement and engagement with our feedback. The analysis shows, and the company confirms, that it is financeable on a notional basis with a 4.8% equity return at the BBB+ rating which the company was targeting without the need for mitigating actions (and its analysis indicates that this would probably be so even with a 4.3% Cost of Equity allowance with a BBB rating). We consider the ratings that the company is targeting for the Notional Company, which are at the high end of BBB+/Baa1, to require explicit consumer engagement and support. We were clear to the company in both August and November that the targeting of ratings higher than necessary to achieve an investment grade rating required detailed justification. The plan presents extensive comment on this topic from which one of the conclusions drawn that the company's cost of debt would be 60bps higher on the basis of a BBB- rating. However, we would have liked to see a more holistic analysis (taking into account, for example, the impact of higher gearing) of the potential implications for the consumer of targeting ratings higher than necessary to achieve investment grade.

For the Actual Company, SGN appears to accept a BBB target rating on the basis that it is financeable at that rating after mitigation and that its shareholder profile is such that timely equity support in the event of any cash flow constraints is relatively straightforward. We considered this helpful on the basis that it is at no cost to the consumer although we note that the current very high level of gearing of the Actual Company is likely to be a contributory factor to the low ratios.

SGN presented evidence of a good deal of engagement with consumers on detailed issues relating to financeability from which it felt able to draw the conclusion that consumers were supportive of a higher Cost of Capital allowance and considered any attempt to alter either the depreciation period or the capitalisation rate as unwarranted on grounds of intergenerational fairness. On the basis of this engagement, changes to both the depreciation period and the capitalisation rate are rejected, as are a variety of other potential mitigation measures. In fact, no mitigation measures are required for the Notional Company to achieve financeability. We take the view that, although it was encouraging to see that there had been considerable high level engagement with consumers on financeability issues, SGN had been insufficiently ambitious in exploring mitigating measures and/or the impact of lower ratings targets and engaging on those issues with consumers.

Despite the fact that, in our view, the Plan demonstrates that financeability would be achievable even without the outperformance assumption i.e. with a 4.3% equity return, the company makes clear that it is not happy to proceed on that basis. Its proposed 'SGN Working Assumptions' case is based on a 6.9% Cost of Equity allowance, 65% (rather than Ofgem's 60%) gearing and a Cost of Debt allowance based on a trailing average of 15-20 (rather than 11-15) years. Although SGN appears to have achieved consumer support for this proposal, we consider it unnecessary to secure financeability.

Overall, the SGN Plan is compliant with Ofgem WAs and confirms that it would be financeable on both a Notional and an Actual basis. We felt that the company could

have been more ambitious in analysing potential further reductions in costs to consumers and that its alternative SGN Working Assumptions' case was unnecessary (although, as requested, it was well distinguished in a separate annex).

10.14. Consumer Value Proposition

SGN has included an extensive CVP covering core elements of the business such as the target productivity saving, volume drivers to align allowances with workload and BAU and non-BAU innovation, bespoke outputs, including some environmental actions and measures to support vulnerable customers and areas where it is taking a leadership role such as promoting changes to standards. Many of these are things which we think form part of the ordinary business of an energy network or will be incentivised through other mechanisms.

Of the list of CVP proposals put forward by SGN we thought that the following might have some merit in terms of delivering additional value which will bring benefit to SGN consumers and drive best practice:

- Additional transparency through using lower CBA threshold – SGN has used £0.5m threshold for providing CBAs rather than required £2m. We have noted above some limitations in the CBAs but if use of the lower threshold assists Ofgem in relation to assessment of Totex for SGN and other GDN companies we think that this should potentially be recognised.
- We also thought that there were some elements of the support for customers in vulnerable circumstances, for which a reward is being claimed on basis of health and well-being benefit, which SGN claims are at least best in class. However, as noted elsewhere, we anticipate that Ofgem may want to look in the round at the initiatives of each GDN to support vulnerable customers and to benchmark the various packages against best practice in other sectors to identify whether a reward is justified in this area.

11. Company Report - Scottish Power Electricity Transmission (SPT)

11.1. Summary

The following table sets out our rating for the SPT final December Plan, together with the average ratings we have given SPT during their Plan preparation stages. Our summary comments are provided below with further detail provided in an appendix.

Table 1: SPT Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms	n/a	
Outputs: vulnerable consumers	n/a	n/a	Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October Plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to red where we thought it was weak or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December Plan ratings – our RAG ratings on their final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the Plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is weak and the company proposals are not acceptable. Our explanatory comments are provided in this report.

11.2. Plan highlights

- Costs – SPT expects to underspend its RIIO-1 Plan by 3.2%. SPT's Totex is decreasing 6% from RIIO-1 to RIIO-2, largely driven by a 31% decrease in load related costs. However asset replacement costs are increasing by 15%. SPT are forecasting a 1% p.a. efficiency increase. SPT are also proposing sector and bespoke uncertainty mechanisms but most costs are unknown at this time.
- Outputs – All output targets for RIIO-1 are being met or exceeded. For RIIO-2, in addition to sector outputs, SPT are proposing 30 bespoke outputs with some funding included in the Totex baseline.
- Financing – SPT's Notional Company is financeable at a rating of BBB+ on the basis of Ofgem's Cost of Capital WAs, even without the 0.5% outperformance assumption.

11.3. Track record

Ofgem's Business Plan Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs – SPT expect to meet or exceed all their output targets for RIIO-1.

RIIO-1 Totex – Clearly explained in the Plan with SPT stating that "We are not forecasting the deferral or delay of costs from RIIO-1 that would increase costs in RIIO-2". A small number of "equal value" substitutions during RIIO-1 were made, which appear justified. The Plan provides a clear link between NLR expenditure in RIIO-1 to that proposed for RIIO-2. Overall, once allowance adjustments are taken into account, SPT forecast an underspend of 3.2% on their Totex allowance.

Reasons for changes in RIIO-1 load-related and non-load related expenditure are explained. For RIIO-2, SPT are proposing better planning and more accurate uncertainty measures such as for Generator connections, to take into account the required length of network extension in addition to capacity.

RIIO-1 Returns – SPT forecast a 9.4% return on regulatory equity for RIIO-1. Details of dividend pay outs are also provided.

11.4. Business Plan commitment and assurance

SPT's Plan contains an exemplary Board Assurance Statement signed by all Board members and incorporating a clear statement that they consider the Plan to be accurate, efficient and ambitious and that they are confident it is robust. There are also explicit statements in relation to deliverability and financeability. The Governance and Assurance Section of SPT's Plan includes quotations from the three SIDs which focus on stakeholder engagement, net zero and assurance and governance arrangements and there is also a short statement from the chairman.

The arrangements for governance of the Plan development, together with the risk-based analysis on which they are based, are both well described. A 'three lines of defence' system is in place, based on an assessment of risk which is described in detail, as are the associated governance arrangements. The 'three lines' are principally, though not exclusively, internal (and some of the internal assurance/audit arrangements although within Group are external to SPT itself) and the overall arrangements have been subject to review by an independent expert. External assurance/advice has been provided by a range of other experts (including Arcadis, Complete, Ramboll and Sia Partners). Citizens Advice Scotland and Community Energy Scotland are also described as having been involved in assurance. The final letters from all assurance providers are helpfully appended to the report.

Although there is no clear statement that staff and senior management remuneration is aligned to plan outputs and detail is limited, there is a reference to a link between directors' remuneration and customer service objectives. The Customer Services Director has a 68% weighting in the personal element of his bonus linked to such an objective (not surprisingly the highest percentage among the directors). Detail is limited.

11.5. Stakeholder Engagement

The impact of stakeholder engagement on the Plan was not particularly clear in the first draft but this improved considerably in later drafts. It was well articulated at a chapter-by-chapter level but the overall impact of stakeholder and consumer engagement on the Plan, and the way in which SPT had resolved the overarching trade-offs involved, could have been clearer.

Engagement to build the Plan is strong with industry stakeholders and includes research directly with consumers for the first time. SPT also commits to continue with direct consumer research as part of its future strategy. This is a positive step. However, it was unclear what this future consumer engagement would involve beyond engagement with consumers directly affected by the company's works and 'more innovative market research'. It also plans to restrict its targeted engagement with individual vulnerable consumers to its distribution business – while it plans to do some work to support vulnerable communities as part of the bespoke incentive discussed below.

SPT says it has achieved a 'Mature' rating in an audit of its performance against the AA1000SE standard. It was also encouraging to hear that the insights from stakeholder engagement are reported monthly to the CEO and executive team. Overall, though, we would have liked to have seen more evidence in the Plan of how stakeholder engagement is embedded in the organisation. That said, the social return on investment tool is a positive development as is the commitment to report annually on engagement performance, including a target of 'a 5% improvement year on year on the social benefits generated'.

In its acceptability testing, SPT decided to survey customers both inside and outside its 'patch', and breaks out the results on these lines. Overall 81% of stakeholders and 82% of domestic consumers find the Plan acceptable. Results are higher within SPT's patch than outside it. These are at the lower end of the range of results for companies within this price control although we find it difficult to draw any conclusions from this given the differences between different companies in both method and reporting.

There are two bespoke incentives in this area. The first is a reputational incentive to measure 'delivery against our stakeholder strategy'. As we have said in response to similar proposals from other companies, this is an important initiative but, culturally, one that we think should now be regarded as business as usual rather than requiring a reputational 'incentive'. The second bespoke proposal is for a financial incentive with a proposed strength of 0.5% of revenue (equivalent to £1.73m per annum in 2018/19). It is focused around three areas: a programme to engage with vulnerable communities with the aim of increasing their resilience during black starts or other events which result in extended periods without supply; an initiative to 'upskill' volunteers in Community Energy Schemes to 'enable them to positively contribute to their own communities'; and third, a commitment to improve stakeholder engagement performance measures including achieving 75/100 on the AA1000SE standard. It clarifies that the cost of these initiatives are not in the baseline and would only be awarded if they were successful, as judged by their User Group each year.

We see value in some of these proposals but are unconvinced that they merit an extra financial incentive. The engagement around understanding the impact of a black start, particularly on vulnerable communities, is welcome, and building

resilience during these events should be valuable. But we felt that engagement of this type should be an essential part of a transmission company's approach. Upskilling Community Energy schemes would be valuable and should support the energy transition, although we would prefer greater clarity on costs. The AA standard target is welcome but not outstanding compared with other companies' Plans. Overall, we suggest that Ofgem explores this area further at the Open Hearings, including SPT's apparent plan to leave wider engagement with individual vulnerable consumers to its distribution business.

11.6. Outputs

SPT have provided 30 bespoke outputs in addition to those required by the sector methodology. Eighteen of these are identified as price control deliverables (but many are also flagged as uncertainty mechanisms), eight are ODI-F, and four are ODI-R. Funding for certain bespoke outputs is included in baseline Totex at a cost of c£0.77bn.

The total range of output incentives, excluding SF_6 and Insulation Interruption Gases, has been defined and quantified as £m (5yr) of +£68.9 to – £58.0, which includes measures worth up to £m (5yr) 17.3 that will be assessed initially by the Company User Group, with a recommendation to Ofgem for final determination. It will be important that, if taken forward, external stakeholders have confidence in the governance around the role of the Company's User Group in the process. In addition SPT proposes a "Use it or Lose it" incentive of up to £1.5m p.a. to mitigate the risk of loss of supply to distribution customers during planned outages on the system.

11.6.1. Customer Outputs

For the new quality of connections survey, SPT proposes a 'baseline' of 7 which it explains would be the starting point for receiving a reward (or avoiding a penalty). This is higher than the company's average RIIO-1 performance of 6.9 but lower than their scores in the last two years (7.8 and 7.7/10 respectively). This baseline seems low given that it would potentially be rewarding performance that is lower than currently provided by all TOs.

However, SPT does also propose a performance 'target' for RIIO-2 of 9. This appears stretching and to demonstrate company confidence that the specific service proposals it is planning will meet stakeholders' needs. It is also worth noting that, although it was not required by Ofgem as the survey method is still under review, SPT was the only one of the three transmission network companies to propose a target for this new survey in the final version of its plan.

Like the other transmission operators, SPT believes that the satisfaction survey incentive should remain at 1% rather than dropping to 0.5%. We still support Ofgem's intent of not expecting consumers to continue to pay extra for what should now be regarded as 'BAU' service levels but only paying for notable improvements.

The Plan also sets out a number of specific service improvements including: pre-application meetings and a commitment to 'examine the potential for co-design with network users'; a digitised connection portal; a 'transparency' report on post-offer changes that are caused by SPT actions; and more and earlier outages information. The outputs appendix shows a number of quotes – to show how the proposals are

designed to respond to stakeholder feedback. But it didn't appear to show quantified levels of stakeholder support for these ideas.

For the Energy Not Supplied incentive, SPT proposes a target of 178MWh. This represents a 21% tightening compared with the T1 target of 225MWh. However, as with all the electricity TOs, that needs to be set in the context of the RIIO-1 actual annual average which for SPN is 19MWh. We suggest that Ofgem carries out a more detailed cross-company comparison of targets in this area to ensure that they are appropriate and equally stretching. The Plan also makes helpful suggestions for how to take into account the growing impact on customers of the loss of distribution-connected generation during transmission events.

11.6.2. Resilience outputs

Asset resilience - Overall a comprehensive response. SPT proposes to report on LOs, e.g. Safety, NAP, and Non-Lead Asset delivery, with zero reward/penalty as part of an annual performance assessment against Plan targets. For lead assets SPT have calculated that the Plan should deliver a NARM monetised delta risk of r£1.6bn. NARM and the maturity of the data underpinning is are relatively new and we suggest that Ofgem validate this output measure with the Company.

Workforce Planning - Details of the human resource plan are presented, which seem timely, proportionate and practical.

Cyber Resilience – SPT have included £15m for a cyber security plan in response to the Network and Information Systems Regulations 2018. Ofgem will be assessing this plan due to its confidentiality.

11.6.3. Environment Outputs

This is a strong area of the Business Plan, supported by a clear and comprehensive EAP, which has built on well-judged earlier versions. Changes have mirrored areas which we have suggested for development in our earlier assessments.

The result is a clear presentation of track record, including a recognition of significant issues with SF6 leakage during RIIO-1, and a set of environmental commitments to achieve what is recognised by SPT as a step-change in sustainability action in comparison with RIIO-1 commitments and performance. The Plan is supported by an EAP which contains some clear and thoughtful analysis of the environmental challenges with good quantification in a number of areas and which shows good understanding of climate change resilience/adaptation.

The December Plan contains a significantly strengthened commitment in relation to action on SF6 (reflecting challenge from us and the User Group), although the framing of the business carbon reduction target of 15% by 2023/80% by 2030 and the current absence of science-based targets make it difficult to compare the ambition of this Plan with other TOs in respect of emissions reduction. Commitments in relation to fleet, supply chain and biodiversity have all been made more specific in response to challenge and there is an increased commitment in relation to minimising network losses.

There are two proposals to support communities in relation to the transition to Net Zero: the net zero fund, which is a continuation of the RIIO-1 Green Economy Fund, intended to assist vulnerable communities to participate in benefits of local energy

solutions and a proposal to make non-operational land available to community groups for renewable energy schemes discussed below under ODIs. The net zero fund appears to have stakeholder support and to align with Scottish Government objective and since it builds on the existing work should be able to deliver benefits cost-effectively from the outset but we would expect to see rigorous governance, engagement and impact measurement.

11.6.4. Bespoke ODIs

SPT are proposing a bespoke reputational ODI relating to delivery of benefits from use of non-operational land (e.g. where redundant assets have been removed). The proposal is that sites which are suitable for installation of micro-renewable technology will be made available to local community groups free of charge. In response to stakeholder feedback on increasing biodiversity SPT proposes to require groups who take on sites to deliver biodiversity enhancement. This seems to us to be a well-constructed output which is in line with aspirations of the Scottish government for increased community-driven low carbon generation for minimal additional cost.

SPT are also proposing a bespoke financial ODI relating to three proposals which sit outside the EAP targets for carbon reduction and environmental impact management. They relate to supply chain sustainability, accelerating fleet transition and delivering biodiversity net gain. This is a reward only incentive with indicative maximum annual reward of £1.73m. Whist we are supportive of these output targets we are disappointed that SPT considers that additional financial incentivisation is appropriate given its aspiration to be a leader in sustainability and we do not think a financial reward should be necessary.

11.7. Towards Net Zero/Whole system

The Plan takes a fairly comprehensive approach to scenario planning based upon CCC analysis. Scenarios look beyond energy to cover heat and industry and cover a range of network issues – and some projects in these areas (e.g. black start) appear to genuinely go beyond RIIO-1. The Plan also proposes forward-thinking solutions (taking a strategic rather than a traditional incremental approach).

SPT recognise that whole-system based coordination is vital and engaged with all key stakeholders (including the National Infrastructure Commission and ICF) in order to support the delivery of Net Zero. Specific examples of cross sector working include joint working with SGN on gas peaking plant, working with DVLA to identify EV registrations and whole system planning across SPT and SP Distribution.

Although there is reference to work with the Scottish government it is not clear how this has informed the Plan. At the margin, some references to new technologies and to work beyond RIIO-1 may slightly over claim.

11.8. Digitalisation plans

SPT provided an initial digital plan in October and the full strategy was provided in December. We commented that their focus was on “Big Data” as an aid to opening the market, and of analytical capability as an aid to optimising asset health decisions, and real time system map as support to operations. They helpfully described the incorporation of Innovation learning from RIIO-1 in the RIIO-2 plan, notably digital

substation (FITNESS). However, the Plan was missing a clear articulation on where SPT are now on the digitalisation journey and of future delivery.

The December Plan contained good high-level vision statements on digitalisation but lacked the overall holistic strategic view of "from" and "to" articulated by other respondents. The digital strategy paper was difficult to navigate with many independent sections without a cut-across between them. There was little on dependencies, timelines, and quantifications.

Overall, despite some good material being provided, we think the plan is missing a delivery narrative covering where they are now, where they will get to, specific initiatives to execute on, risks and CBAs for these sorts of initiatives. There is evidence of good thinking on some new topics e.g. open data and data quality, plus the ambition for SPT as a collaborative partner is strong, and they have clearly considered whole systems aspects.

However, we think SPT is at an early stage in its digitalisation journey. Prior innovation successes e.g., digital substations, EV charging, appear still quite focused on physical solutions. Digital substation work is referred to throughout as proof that digitalisation is happening. There is little on digital culture. Although the iHUB platform launch seems promising it is at an early stage. We are not convinced that the plan will transform SPT into an organisation capable of quickly providing high quality, business ready solutions.

11.9. Managing Uncertainty

SPT have provided considerable detail about its proposed uncertainty proposals, covering cost pass through, reopeners, unit cost adjustments (UCA), and volume drivers. Five key proposals relate to Load Related Expenditure and are shown in the Table 1 below.

Table 1. Main LRE uncertainty mechanisms

Main LRE uncertainty mechanisms	Baseline	Estimated maximum additional cost adjustment
Volume Driven		
Generation Connections	£109m	£506M[19]
Demand-related Infrastructure	£116m	£40m[20]
Unit Cost Adjustment (UCA)		
Net Zero System Operability	£55.7m	£150m
Total Volume and UCA Driven Ums	£277.4m	£696m
Re-openers		
Load Related Strategic Wider Works	n/a	SWW Reopener would apply for any scheme >£100m. One known project with cost range £1.7bn - £2.3bn, based on estimates for SPT-NGET Eastern Link. Projects will also be assessed for delivery through competition.

We note that the automatic volume driver and UCAs above could increase costs by an additional £696m above baseline of £277m. SPT have presented an analysis in support of relatively complex drivers, compared to those used in RIIO-1, which should improve their accuracy. We suggest however that Ofgem seeks independent validation of the proposals and in particular ensures that they do not introduce any bias or asymmetry that might disadvantage customers.

The proposal to retain a reopener for SWW >£100m seems appropriate, and we note the proposal for a new Net Zero Transition annual reopener, triggered for Totex adjustments between £25m and £100m. SPT explain that the potential solutions and associated costs to meet uncertain capacity needs vary considerably, and that without this mechanism, there would be no means of recovering costs in period.

[19] Up to £615m if all 5GW of contracted generation connections were to proceed.

[20] Based on estimated Network Rail works

These appear to be reasonable supporting arguments, provided that Ofgem is content that the balance of risk is shared fairly between parties and the potential benefit is not offset by the costs of managing the process.

SPT have presented evidence that the UM proposals are supported in principle by stakeholders. SPT's baseline plan expenditure and proposed allowances for LRE are based on their own processes and engagement with stakeholders to select projects with a high probability of proceeding during RIIO-2. This approach appears broadly consistent with the lower end of RIIO-2 Common Energy Scenario, and takes specific account of contracted applications for generator connection, and the results of the ESO NOA process.

In addition to the UMs discussed above, SPT are proposing another thirteen mechanisms. We have concerns about a number of these costs being potentially passed to consumers, including:

- Unit cost allowance for uncertain costs e.g. land purchases and generator connections, associated with non-load related expenditure
- Brexit
- Wayleave Review Adjustments
- Energy Data Task Force.

We believe that where these are taken forward, they need to be very clearly defined and considered in the round of risk apportionment between the Company and customers. We think that such proposed reopeners may be regarded as covering risks that could be better borne by the Company, or addressed through a different mechanism.

Generally, we are concerned by the asymmetric nature of these reopeners, i.e. if legal and other business risks are more favourable, customers would not benefit to the same extent. We would therefore suggest that a relatively high bar is set for each UM.

RPEs – SPT suggest that an RPE of 0.97% is appropriate for RIIO-2 based on their analysis of the key price variables in RIIO-1. We consider that many of the costs that SPT have proposed, e.g. workforce costs, are under their control and any residual cost drivers are likely to fall below a materiality threshold. We think these costs should not be included in RPE indexation. SPT have advised that they have not included any efficiencies associated with RPE's in their plan.

11.10. Efficiency – innovation and competition

Innovation – SPT claim that their innovation initiatives in RIIO-1 will lead to a £30m reduction in RIIO-2 expenditure. SPT propose to use £18m (1.3% of Totex) of NIA and additional Innovation Roll-out funding in RIIO-2 to achieve over £70m of benefits in RIIO-3.

Competition - SPT have identified the HVDC Eastern Link as a candidate for late competition and other competition opportunities at four sites where synchronous compensation is required. Competition is addressed in detail in Annex 18, where details of a native competition plan is provided and schemes for potential early or late competition are listed. We think that SPT could have been more proactive and identified projects suitable for competition that fell below the Ofgem criteria.

Generator connection sole works could have been considered for competition for example.

Efficiency- The proposal to set the combined on-going efficiency target and RPE adjustment mechanism to net off at zero effectively incorporates an on-going efficiency target, of 0.97%, matching SPT's RPE forecast. We are concerned that efficiency savings are already baked into the plan and that there is potential for this efficiency target to be higher.

11.11. Costs

11.11.1. Forecasting and Scenarios

SPT appear to have taken a fairly practical approach to scenario planning and there is evidence within the CBAs that projects have been tested for robustness against future scenarios. The Plan discusses some of the possible implications of the Net Zero scenarios and seeks to address those through working with the ESO, DNOs and other stakeholders, and meeting the costs, through uncertainty mechanisms.

11.11.2. Costs - the SPT Plan

Ofgem's Business Plan Guidance requires companies to justify costs, including cost drivers, consideration of options, and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

The SPT December Plan proposes Totex expenditure of £1,375 million for the RIIO-2 period as shown below. This has decreased by around £50m from the £1,425 million proposed by SPT in their October 2019 draft Plan. The SPT Plan expenditure summary breakdown is set out below.

- Load related (£540m), comprising £109m Generation connections, £116m Demand connections, and £315m of wider works
- Non load related (£542m), including lead and non-lead assets
- Opex and other (£293m), including £76m of Operating costs and £140m of Engineering and Corporate support.

11.11.3. Our critique of SPT costs

To assess costs, we have used the key cost elements that are reported consistently by SPT to Ofgem over price control periods and supplied in their December data tables, which are set out in the table below. This shows the same total as SPT's above breakdown of expenditure, but the categories and totals are different from the numbers presented in the SPT Plan. We have compared the RIIO-1 average expenditures with the RIIO-2 forecast expenditures as shown below.

For changes between RIIO-1 and RIIO-2, the RAG ratings in Table 2 below highlight the range of highest increases (red) to highest reductions (green).

Table 2. RIIO-1 to RIIO-2 SPT Cost Comparison

Price Control Costs Funding Category (£m)	RIIO-1 Average	RIIO-2 Average	RIIO-2 Total	% Change
Local Enabling (Entry)	54	15	75	-72%
Local Enabling (Exit)	4	10	52	170%
Wider Works	68	55	275	-20%
LRE - sole-use Local Enabling (Exit - Sole U	5	10	50	116%
LRE - sole-use Local Enabling (Entry - Sole	5	5	23	-14%
TSS Infrastructure	0	-	-	-100%
Total Load Related Costs	137	95	474	-31%
Replacement	66	77	384	16%
Refurb	8	13	66	57%
Non-Load Other	4	1	3	
Total Non-Load Related Costs	79	90	452	15%
Non-Operational Capex	2	3	15	27%
Total Network Operating Costs	14	22	110	53%
CAI	41	34	168	-17%
Business Support	18	21	103	13%
Total Other Costs Within Price Control	-	3	15	
Total Costs within Price Control	292	275	1,375	-6%

Highlights from this comparison are that load related expenditure (LRE) shows a 31% reduction but remains at a significant level (£474m) and non-load related expenditure (NLRE) increases by 15%. Network operating costs have increased by 53%. However, we note that SPT advise us that some of the above expenditure categories are calculated on a different basis between RIIO-1 and RIIO-2. We request that Ofgem investigate this further.

11.11.4. NLRE

In assessing NRLE, we have focused on comparing SPT's cost and volume forecasts with current run rates for asset replacement. We have considered the engineering evidence for interventions, and invited SPT to undertake sensitivities for alternative expenditure profiles. We have reviewed cost benchmarking and asset health information but expect Ofgem to undertake more detailed analysis in this area.

SPT's Business Plan Data Templates show that £384m of NLRE expenditure is categorised for replacement, compared with £66m for refurbishment, a ratio of around 6:1. This ratio is around 8:1 for the first five years of RIIO-1, apparently indicating a move to greater replacement in RIIO-2, which may be less costly.

11.11.5. NLRE Cost comparison

For RIIO-2 NLRE expenditure, we have used the SPT submission that accompanies their Business Plan Data Templates to evaluate the changes to expenditure and volumes by asset type that have taken place between RIIO-1 and RIIO-2. These tables include capitalised indirect costs as well as direct costs so are not directly comparable with the overall cost comparison shown above.

Table 3 below shows the changes between the actual average expenditure for the first five years of RIIO-1 compared to the equivalent forecast for RIIO-2. The RAG

ratings below highlight the range of highest increases (red) to highest reductions (green).

Table 3: RIIO-1 to RIIO-2 SPT NLRE Cost Comparison

Funding Category £m	RIIO-1 Business Plan	RIIO-1 Actual & Forecast	RIIO-1 Actual & Forecast Average	RIIO-1 Actual Average	RIIO-2 Total Forecast	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change	RIIO-1 5yr actual to RIIO-2 change
	(8 yrs)	(8 yrs)	(8 yrs)	(5 yrs)	(5 yrs)	(5 yrs)	(%)	(£m)
Transformer	54	71	9	9	32	6	-29%	-3
Reactor	15	17	2	2	8	2	-20%	0
Circuit Breaker	148	162	20	19	124	25	31%	6
Cables	20	12	2	0	21	4	>100%	4
OHL Conductor	326	268	34	34	230	46	35%	12
Protection & Control	100	109	14	10	70	14	40%	4
Other TO	128	124	16	9	118	24	162%	15
Total	**791**	**763**	**95**	**83**	**603**	**121**	**45%**	**38**

Table 3 indicates that there is a significant increase in expenditure overall, with an average annual increase of £37m (or 45%). The table shows that the main increases have occurred on a) overhead lines, b) protection and control, c) circuit breakers and d) other TO.

Also, the 8 year (actual plus forecast) RIIO-1 average is higher than the 5 year actual average, indicating that SPT anticipates accelerating asset replacement and/or /refurbishment expenditure in the last years of RIIO-1 – if this does not take place and the NOM's output is still met then the RIIO-1 average may fall, increasing savings and returns for the company.

11.11.6. NLRE volume and unit cost comparison

SPT's volume forecast for activities on key assets as shown in the table below, comparing average annual volumes for the categories that they have identified between RIIO-2 and the first 5 years of RIIO-1. Table 4 below shows an increase in overhead line/fitting volumes, switchgear and in protection and control. The RAG ratings below highlight the range of highest increases (red) to highest reductions (green). We note that these volumes (and associated costs) for NLRE have increased between the October and December plans.

Table 4: RIIO-1 to RIIO-2 SPT NLRE Volume Comparison

Volumes	RIIO-1 Business Plan	RIIO-1 Actual & Forecast	RIIO-1 Actual & Forecast Average	RIIO-1 Actual Average	RIIO-2 Total Forecast	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change	RIIO-1 5yr actual to RIIO-2 change
	(8 yrs)	(8 yrs)	(8 yrs)	(5 yrs)	(5 yrs)	(5 yrs)	(%)	(£m)
Transformer							0%	
Reactor							0%	
Circuit Breaker							150%	
Cables			Redacted for commercial sensitivity				75%	
OHL Conductor							66%	
OHL Fitting							498%	
OHL Tower							>100%	
Protection & Control							>100%	
Other TO							>100%	

Based on data in the above tables, we have also compared actual unit costs in the first 5 years of RIIO-1 with the RIIO-2 forecasts. These are shown below in Table 5 for the categories that it has been possible to compare. The RAG ratings below highlight the range of highest increases (red) to highest reductions (green).

The table shows unit costs reducing in each area – we think this should be examined further to ensure data is clearly and consistently presented and compared with other TO's as well.

Table 5. RIIO-1 to RIIO-2 SPT NLRE Unit Cost Comparison

Unit Costs (£m/unit)	RIIO-1 Actual Average	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change
	(5 yrs)	(5 yrs)	(%)
Transformer	Redacted for commercial sensitivity		-29%
Reactor			-20%
Circuit Breaker			-48%
Cables			>100%
OHL Conductor			-19%

11.11.7. NLRE justifications

On NLRE, SPT do not appear overly risk averse. They seek to avoid early replacement of transformers through refurbishment, where suitable. For overhead lines they provide independent consultant comments that their policy on residual line strength only differs marginally from the consultant's own view.

Overall most of SPT's NLRE investment is justified on the basis of maintaining the current levels of asset risk and asset condition in each of the key asset categories. For lead assets, SPT say their plan will reduce monetised risk by r£1.6bn, offsetting the underlying increased risk that would occur with no intervention; and a Longer Term Risk Benefit of r£29.1bn is cited. SPT have also provided the monetised risk benefit for each lead asset project.

The values for the risk benefit generally look high and we suggest that Ofgem discusses their calibration against figures being quoted by the other TOs. SPT explained the progress made during RIIO-1 in capturing and applying asset condition data to drive their investment programme.

At our meeting in October we discussed a number of SPT's main asset categories i.e. overhead lines, and transformers, and we found their responses fairly reassuring that plans were based on actual asset condition assessments and data, and a review of alternative options for intervention.

11.11.8. LRE

SPT's plan proposes four main areas of load related expenditure in the baseline plan, namely:

Boundary upgrades – All of these projects are conditional on the NOA assessment run by the ESO which considers if alternative solutions are available e.g. flexibility

providers or DNO's. SPT have proposed to include six projects, based on the fourth NOA report dated January 2019. Four of the projects totalling £82m in RIIO-2, would respectively prevent a reduction of 500MW in boundary capacity when Hunterston Power Station closes in 2023, increase B4 boundary capacity (with SHE-T) by 1200MW in two stages by 2026, and B5 capacity by 120MW by 2022. The other two projects with total expenditure of £114m aim to increase capacity in early RIIO-3, by 800MW on B5 and 280MW on B6. We suggest that in setting baseline allowances Ofgem review the level of certainty associated with each of those proposed projects including if boundary volumes are confirmed, the unit costs.

Network reinforcement – Much of this appears to be for voltage, stability and black start, which could be provided through non-network means. SPT had proposed to include expenditure for synchronous compensation in their baseline plan, but in response to feedback have removed this and propose to include a Unit Cost Allowance for synchronous compensation within the proposed Net Zero Operability uncertainty mechanism mentioned above.

We suggest that in setting baseline allowances, Ofgem review the level of certainty associated with each spend area. Even if network reinforcement volumes are confirmed, the unit costs still need to be assessed, both in setting the baseline and in confirming the unit cost allowances for any associated Uncertainty Mechanism. While projects are identified, these projects appear to be conditional on ESO decisions, or confirmation of earlier conclusions, that they are the most efficient solution. Assuming the scope of the Net Zero Operability UM is agreed, and depending on the conclusions from Ofgem's review, there could be a case for switching some baseline expenditures into the UM mechanism.

Generator connections – the baseline proposals appear to be based on an informed review of the known generation projects that have applied for connection. This spend area is covered by a proposed UM, which should protect customers against a downward adjustment from the baseline of £109m and 900MW. Nevertheless, under the "Consumer Evolution" Future Energy Scenario, SPT estimate that expenditure could fall to £57m. We suggest that Ofgem consider whether the proposed baseline might be set lower than 900MW, recognising the importance of the associated UM in adjusting allowances in line with outturn.

Demand connections – the baseline proposals are for spend of £116.2m, including £38m for completion of projects started in RIIO-1. Of the remaining £78m, around three quarters is to manage fault levels and to provide new Grid Supply Point capacity driven by the growth of new generation on the distribution network. The remainder is mainly driven by Network Rail's electrification program. SPT have proposed a UM, which should protect customers against a downward adjustment from the baseline. In particular, SPT point to its use in adjusting allowances to cater for uncertainty in Network Rail's outturn needs. Again, it is important that the unit costs and design of the UM are accurate, and we suggest that independent verification of these is highly desirable.

Overall, the need cases for demand expenditure appear to be well evidenced on the basis of customer requirements, and in particular coordination with the DNO. SPT appear to have addressed the risks of unserved demand and stranded assets through Uncertainty Mechanisms (to avoid over-building of load related assets and to make provision for rapid deployment if required of operability solutions).

11.11.9. Opex and other costs

SPT's Business Plan submission proposes £293m for these areas of expenditure in RIIO-2. The equivalents as submitted in the Ofgem Business Plan Data Templates are set out below, totalling £382m.

- Network operational costs - £110m, an increase of 53%
- Closely associated Indirect costs - £168m, a decrease of 17%
- Business support costs - £103m, an increase of 13%

Overall, these three areas taken together show an increase of around 4% from RIIO-1. We note that Business support costs appear to have increased due to a change in allocation methodology. It is unclear whether efficiency savings have been captured. We request that Ofgem examine this area further in their plan analysis and determination of efficient costs.

IT and telecoms – we note that SPT have included £12m in their plan for IT, including resilience and £40m for operational telecoms, of which we understand £19m is for resilience. However, the associated business plan data templates indicate £37m of IT expenditure.

11.11.10. Totex sensitivities

In August 2019, the CG asked SPT to provide two downward sensitivities for Totex forecasts in their October plan:

- A forecast for non-load related and Opex expenditure which is no greater than the annual average of RIIO-1 actual to end March 2019 (years 1-6 of the 8 year RIIO-1 control period).
- The above with an additional efficiency reduction of 2% per annum in NLRE and Opex.

A comprehensive response was received setting out the potential actions that could be taken and the risks involved if these choices were taken.

11.11.11. Cost Summary

SPT have provided good evidence in their draft and final Plans in response to our requests for expenditure justifications. In our assessment, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements.

We have considered evidence to justify a) the need case, b) the type of intervention, c) whether unit costs are efficient, and d) whether the expenditure was previously claimed under RIIO-1 and customers have already funded it.

Overall, we find expenditure in the SPT Plan to be well explained but we are concerned that the NLRE has increased significantly. We have identified the following areas of concern for Ofgem to probe further.

- Justifications for additional non-load related expenditure, where expenditure appears to be around 45% higher than current run rates. Some asset replacement volumes appear to have increased significantly and should be investigated further.

- The scope and timing of load related and boundary reinforcement expenditure may be uncertain. Some of this may need to be included in uncertainty mechanisms.
- Corporate and business support costs are forecast to increase by 13% and justification for this increase is weak. Efficiency benefits do not appear to have been included.

11.12. Engineering Justifications and CBA

SPT have provided Engineering Justification Papers (EJPs) for proposed named schemes, which is welcome. These have generally been well set out, provide a logical justification, and have considered several options as well as the one proposed for implementation. In some cases, SPT explain in the EJP why they have decided to adopt a refurbishment solution for transformers as lower cost than replacement, even though the CBA indicates the replacement has a marginally better NPV.

While we think SPT have presented reasonable cases for their decisions, this nevertheless raises two questions that Ofgem might consider. The first is that, because the NARM monetised risk metric is a key determinant of the benefits calculation in the CBAs, any shortcomings or data immaturity in this metric could both prejudice upfront decision-making, and reduce certainty in the measurement of actual risk reduction benefits delivered to customers.

The other point noted is that CBAs did not always explicitly take into account parameters that we would have expected to feature, such as carbon benefits from reduced electrical losses with replacement transformers. If such factors prove to be material, we would like to see those taken into account in decision-making. These points apply across the whole Sector and not just to SPT.

Evidence from third party reviewers has been provided in various Annexes to support SPT's approach to asset condition and risk assessment methodology (Elias Ghannoum – OHLs, Doble and Polaris – Transformers), optioneering (Ramboll – 19 projects), and cost forecasts (Arcadis 36 scheme reviews on £230m NLRE and £268m of LRE).

In being very specific about their proposals, SPT gave us some confidence their Non Load Related Expenditure plans were robust and likely to be delivered with relatively low levels of substitution or change. It is noted that where SPT had identified uncertainties around NLRE projects, due to interaction with LRE works, they had excluded them from the baseline costs and are seeking a PCD Uncertainty Mechanism. Provided the ex-ante cost allowances are robust, we consider that this mechanism is likely to protect customer interests. SPT also propose a reputational incentive to provide assurance that they are delivering their non-lead asset investments, which are not yet covered by the NARM monetised risk parameter. We believe getting assurance on delivery of this investment is important.

11.13. Finance

We have evaluated the financeability section of SPT's Plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement with both

appropriately qualified consumers and our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem's WAs.

SPT's July Plan was, in our view, non-compliant with Ofgem's Business Plan Guidance in a number of respects. The Plan targeted an A3 rating with justification for targeting a rating so much higher than the BBB- required for investment grade which we regarded as insufficient. There was an emphasis on a higher Cost of Equity allowance but very little consideration as to how changes in depreciation and capitalisation rates, which might be at lower cost to the consumer, could improve financeability. There was no evidence of detailed consumer engagement in relation to trade-offs in individual elements relating to financeability.

The October Plan was considerably improved with both the Notional and the Actual Company modelled using Ofgem's WAs and a full suite of the sensitivities required by Ofgem presented. The non-compliant 'SPT Draft Assumptions' Plan was well distinguished from the cases required by Ofgem. However, SPT continued to target an A3 rating. The analysis demonstrated that the Plan was financeable on both a Notional and an Actual basis with a 4.8% expected equity return, with a Baa1 rating or better. For this reason, we felt that the focus on the SPT Draft Assumptions case based on a 6.5% Cost of Equity allowance was unnecessary. There was still no evidence of detailed consumer engagement in relation to specific elements of financeability.

The Final Plan shows improvement in a number of the areas which we raised in our July and October feedback. In particular, the Plan contains a clear statement that the company is financeable on both a Notional and an Actual basis with a 4.8% equity return at a BBB+ rating or above (the company having targeted ratings of A3/BBB+). This statement is supported by detailed sensitivity analysis using Ofgem's WAs. We also thought it particularly helpful that the Company's analysis took into account both the qualitative and quantitative aspects of Moody's assessment framework.

We can see the merit of having headroom in target ratios over the minimum required to maintain an investment grade rating, but we consider the Plan provides insufficient evidence that targeting an A3/BBB+ rating is better value for consumers than a BBB rating, despite our having suggested in our response to the October Plan that this was an area that would benefit from further analysis. The Company notes that targeting a BBB rating would increase debt costs but does not set out an assessment of possible offsetting factors such as higher gearing which could have benefits for the consumer.

The Plan does, in fact, set out quite a detailed analysis of the cost and benefits of different gearing assumptions but we would have liked to see a fuller quantitative assessment of the potential consumer benefits from targeting a gearing level higher than 60%, especially in the light of the Company's own analysis that its Plan might be financeable at a BBB+ level on the basis of 65% gearing.

Despite this clear evidence of financeability on the basis of Ofgem's WAs, SPT states that it disagrees with Ofgem's assumptions. Its alternative proposal ('Supplementary Business Plan'), is, however, set out in a separate Annex and is clearly distinguished from the compliant analysis of the Plan based on Ofgem's WAs.

The Plan places a good deal of emphasis on consumer engagement in relation to financing but the evidence is of relatively generalised consultation with, even at this stage, little evidence of detailed engagement in relation to specific financing issues and the trade-offs that those imply (in relation, for example, to depreciation and gearing assumptions and target credit ratings).

Overall the SPT Plan meets the requirements set out by Ofgem and, although we consider it could have explored routes to adding value for the consumer in greater detail, it seems to us a genuine attempt to achieve financeability at reasonable cost to the consumer.

11.14. Consumer Value Proposition (CVP)

SPT has adopted a rather different approach to CVP from most other companies, identifying the consumer value, in terms of social return on investment, delivered by each investment area of the Plan. In our October feedback we said that since CVP is about recognising delivery of additional value SPT should focus on identifying areas where the Plan went beyond the normal business activity of an efficient network operator. Despite this feedback the CVP in the final Plan is largely unchanged although the company notes that it has responded to feedback from its User Group and there is a substantial annex setting out the assumptions underpinning the value statements.

The CVP comprises some 20 items most of which we regard as business as usual activities which are funded and incentivised through the Totex regime and do not in and of themselves deliver the sort of additional value which we think CVP is intended to reward. This BAU activity includes innovation (roll out of RIIO-1 and the innovation strategy for RIIO-2), the delivery of load and non-load related Capex, the benefits of which are stated in terms of additional network capacity, avoided constraint costs and additional connected generation, proposals for substation energy efficiency and SF6 commitments, which although more ambitious in the final Plan are not clearly ambitious in comparison with other networks and in our view merely reflect BAU for a transmission business. We have also taken the view that the commitment to train mental health first aiders is not sufficiently ambitious or clearly justified. The other benefits claimed in relation to health and safety of workforce do not seem to us to show ambition or go beyond what a responsible company would be expected to do. The connections incentive, comprising three elements which are part of their core connections offer, have support from the User Group but do not seem to us to be sufficiently good or better than what is being offered by other companies to justify additional reward.

The proposals which we do feel should be considered as potentially offering additional value are within the environmental outputs:

- **network losses strategy**: we feel this could deliver value if the incentives are appropriately set.
- the proposal to **optimise value of non-operational land,** enabling community groups to use land not required for operational purposes to install renewable generation delivering both carbon savings and improved biodiversity is a clear and low-cost proposal which could deliver additional value to current and future consumers.

- **the Net Zero Fund:** we have noted above that this seems to have potential to deliver benefits to vulnerable communities and to support Scottish Government objectives of a low carbon transition benefiting all communities, but noted need for rigorous impact measurement which would allow a refund if measurable outcomes are not achieved**.**

12. Company Report - Scottish Hydro Electric Transmission (SHET)

12.1. Summary

Table 1 sets out our rating for the SHET final December Plan, together with the average ratings we have given SHET during their plan preparation stages. Our summary comments are provided below with further detail provided in an appendix.

Table 1: SHET Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms	n/a	
Outputs: vulnerable consumers	n/a	n/a	Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October plan and during its preparation. Green ratings reflected where we thought the evidence was good ranging to red where we thought it was weaker or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December plan ratings – our RAG ratings on their final December plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings reflect where we think the evidence provided in the plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is weak and the company proposals are not acceptable. Our explanatory comments are provided in this report.

12.2. Plan highlights

- **Costs**: SHET expect to underspend their RIIO-1 Plan by 4% due to reductions in load related expenditure, but overspend on asset replacement. SHET are seeking an increase in Totex of 16% from RIIO-1 to RIIO-2, largely driven by a 256% increase in asset replacement expenditure. They are forecasting a £100m efficiency saving overall (circa 0.3% of Totex). They are proposing sector and bespoke uncertainty mechanisms with some of the costs being identified, including £1 billion for uncertain load related expenditure.

- **Outputs**: all output targets for RIIO-1 (except SF6 earlier in the period), are being met or exceeded. SHET are proposing 23 bespoke outputs for RIIO-2 with funding being included in the baseline.
- **Financing**: SHET state that their Notional Company is not financeable without mitigating actions on the basis of Ofgem's cost of capital WAs.

12.3. Track record

Ofgem's Business Planning Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs: SHET has outperformed most targets for RIIO-1. However, SF6 leakage targets were not met for the early years of RIIO-1, although improvements have now been made so that these targets are being met.

RIIO-1 Totex: a summary is provided, showing that SHET expects to outperform its RIIO-1 adjusted allowances by 4%. The breakdown is quite variable with outperformance on load related expenditure (LRE) and underperformance (or overspend) on non-load related expenditure (NLRE). We are concerned that RIIO-1 expenditure may have been deferred due to these cost pressures. SHET has advised us that they have not deferred expenditure from RIIO-1.

For NLRE, an over-spend of £90m (37%) has been incurred, due mainly to poorer than expected asset health and the requirement to replace some 235 132kV towers. This raises questions about the accuracy and robustness of SHET's asset health data, even today, and whether other planned NLRE has been deferred from RIIO-1 in order to contain the overspend in this category to £90m. SHET state they have not deferred expenditure and we invite Ofgem to investigate further. Non-Operational expenditure is £15m (152%) higher due to the installation of new IT systems, notably Maximo. SHET say they have factored RIIO-1 lessons and cost efficiencies into the RIIO-2 Plan, but it is hard for us to verify this from the data provided. It is also unclear how much forward-looking savings from Maximo have been factored into RIIO-2 projections.

RIIO-1 Returns: SHET forecast a return on regulatory equity of 9.1% for RIIO-1.

12.4. Business Plan commitment and assurance

The Chair's Foreword to the Plan opens with a statement that it is fully supported by the Board. It includes a statement, clearly made on behalf of the SSEPD Board but not signed by individual directors that the Board has confidence 'in the team's ability and commitment to deliver upon these ambitious goals' and that we (by clear implication the SSEPD Board) 'have confidence that the Plan is both deliverable and that the outputs represent good value for money for the GB energy consumer'. The main body of the Plan contains an Assurance Section with a statement in the name of one of the SIDs that the board 'acknowledges and supports the approach taken in developing' the Plan. There is a statement that the boards of both SSEPD (SHT's immediate parent company) and SSE plc (the ultimate owner) have overseen and challenged the development of the Plan.

The statement goes on to a clear statement that the board (of SSEPD) has approved the Plan and has given 'specific consideration' to ensuring that it 'remains

financeable' and that it considers its proposed financing arrangements to be compliant with Ofgem's guidance on financial matters (while referring to a 'well-justified and preferred' alternative).

Governance appears to rely on the fact that SHET's ultimate parent company is a listed company (SSE plc) and, as such, complies with the UK Corporate Governance Code. There is a description of a 'three lines of defence' model of governance of the development of the Plan. All three levels are internal (management, independent compliance function and independent audit team), although the last two sit at Group level, outside the transmission business. There is a reference to the involvement of external consultants in 'high and critical' risk areas but no description of the process for determining what those areas should be. Those covered appear to be cost efficiency, IT, innovation and financing (in the case of the last, principally in support of SHET's proposal for high cost of capital allowances rather than assurance). An Oxera report appears to be appended (not apparent from the printed version of the Plan) but others appear not to be.

There is a reference to executive remuneration and to the fact that it is aligned with the long term goals of SSE. Detail is limited but it lists a number of such goals (supporting renewable output, championing fair tax etc.) by way of example. It adds that individual performance in the transmission business is also measured against factors including 'health and safety, licence compliance, Business Plan outputs and stakeholder engagement'. The annual incentive plan for Executive Directors is 'directly linked to business performance', with a 50-50 weighting between financial and non-financial measures.

12.5. Stakeholder engagement

Many aspects of SHET's approach to stakeholder engagement were either unclear or unfinished in the first two drafts of the plan. Elements that were absent in July and October included: an action plan to support the delivery of their future engagement strategy; clarity on what ongoing commitment SHET would make to consumer engagement; how it had factored the results of engagement into the plan; and the trade-offs involved. These shortcomings meant that it was extremely difficult for us to scrutinise the plan in the round as fully as we would have wished.

The final plan was improved in several areas. The future engagement strategy was clearer and met many of Ofgem's principles. It also set a more realistic performance ambition – retaining the long-term goal of becoming 'at the forefront of engagement practice for our industry and beyond' but focussing first on the nearer term goal of 'industry best practice'. Given SHET's continued weak performance in Ofgem's stakeholder engagement incentive discretionary award, this change seems to reflect a more pragmatic acceptance that the company has some way to go to catch up in this area.

On that note, we are also encouraged by the appointment of a Director of Customers and Stakeholders, and the transparent acknowledgement in the plan of the ways in which stakeholders feel SHET's approach has been lacking in the past (engagement not early enough to enable stakeholders to influence plans, and not targeted enough to match stakeholders' interests).

Despite these improvements, there were still some important weaknesses in the plan. The nature of engagement on each topic, and the way in which it had

influenced the plan could have been set out more clearly on an issue by issue basis in the main body of the Plan. There seemed to have been little or no structured, robust engagement with end consumers on the plan other than the joint willingness to pay research. Encouragingly, there is a commitment to engage with end consumers as part of the future strategy, but the Plan could have been clearer about the extent and the nature of this – there was nothing on what research methods would be used, for example. The overall future cost of engagement could have been clearer. The plan gives a cost of £17.3m (on p10) for the cost of 'Customer and stakeholder engagement, including connections'. A number of itemised costs for elements of engagement are detailed in an appendix totalling c£970k. But this does not include staff costs or the cost of engagement on particular projects. Elsewhere in the main plan, the cost of the 'Stakeholder and customer teams' is given as £1.7m per year, and the cost of 'engagement, consultation, industry liaison and process implementation' is given as £0.4m per year.

SHET conducted a consultation on the July draft of its plan. But we had serious concerns about the method highlighted as evidence for its final, quantitative acceptability testing of the overall plan. The plan cites scores based on audience responses at public stakeholder events captured by the interactive app Slido. The plan says that '89% of roadshow attendees supported the five clear goals' and that 80% agreed the plan was 'fair and affordable'. No details are given for the number of stakeholders attending these events but the October draft says that 'over 100 stakeholders attended our 5 events'. This type of measure might legitimately form one small part of an engagement strategy but, on its own, it is an utterly inadequate way to present the overall acceptability and affordability of a 5-year plan that will pass many billions of pounds of costs through to consumers.

The plan proposes a bespoke reputational incentive that is relevant to this area – which it calls 'Stakeholder Engagement Commitment'. This will hold the company accountable against a range of measures including targets for a stakeholder engagement survey and performance on the AA1000SE audit which is not currently undertaken. This is a positive initiative but, as we have said in response to similar proposals from other companies, we think that, culturally, it would now be better to see these activities as business as usual, without needing to highlight them as reputational 'incentives'.

12.6. Outputs

SHET have provided 23 bespoke outputs in addition to those required by the sector methodology. Sixteen of these are identified as price control deliverables, two are ODI-R and five are identified as 'CVP'. Funding of £870m is identified in baseline Totex.

Overall, SHET has set out their proposed range of output targets and incentives in their plan, and made some assumptions for incentives still to be discussed with Ofgem, e.g. SF6 leakage. Overall these are estimated to result in a total 5-year reward/penalty range of £63m to -£29m, excluding the Totex Incentive Mechanism.

12.6.1. Customer outputs

SHET, along with the other TOs, will work on a new baseline for the satisfaction survey in the last year of RIIO-1. Ofgem has indicated that it expects the value of this incentive to be lower than the 1% available in RIIO-1 because it will only offer a

financial incentive for customers' satisfaction with the quality of connections process. However, SHET says that its 'analysis of the value of good service suggests the incentive should be at least +/- 1%'. We still support Ofgem's intent of not expecting consumers to continue to pay extra for what should now be regarded as 'business as usual' service levels but only paying for notable improvements.

Although this is not required at this stage by Ofgem, it is disappointing that SHET's final plan does not set out a proactive view on what target satisfaction level it believes it can achieve in RIIO-2 for the quality of connections survey. However, its 'Commercial and Connections' policy does detail a number of specific proposals designed to improve its service. These include: a live 'capacity map' accessed through the company website; a new online self-service portal; an 'offer in principle' product; and a service offering 5 year ahead outage plans. There was extensive engagement on the proposals and the plan suggests a good level of stakeholder support for each initiative (ranging from 74% to 92%). The cost of these initiatives and whether this is incremental to existing costs in this area was not clear.

For the Energy Not Supplied incentive, SHET proposes a target of 90MWh. This represents a 25% tightening compared with the RIIO-1 target of 120MWh, but the plan also proposes a dead band of +30MWh so that no penalty would apply until the RIIO-1 target had been breached. As with all the electricity TOs, this proposal also needs to be set in the context of the RIIO-1 actual annual average which for SHET is 28MWh. We suggest that Ofgem carries out a more detailed cross-company comparison of targets in this area to ensure that they are appropriate and equally stretching. In addition, SHET proposes to continue its RIIO-1 customer interruption compensation scheme and it makes helpful suggestions for how to take into account the growing impact on customers from loss of distribution-connected generation during transmission events.

SHET proposes one bespoke reputational incentive in this area – for an 'Enhanced Reporting Framework'. These is a welcome and important proposal but, as with our comments on other plans, we do not think it represents a greater commitment than other companies are making without the need to highlight them with a special 'incentive'.

12.6.2. Resilience outputs

Asset resilience: SHET have explained their approach in their Regulatory Framework supporting document. The key resilience outputs are an ODI for Energy Not Supplied (ENS), an international cost-service benchmark performance, and PCDs for Fault Numbers, Network Monetised Risk (NARM), Smart Network Monitoring, Warehouse (Spares) Facilities, Protection and Control System Maintenance, Physical Security, and Substation Auxiliary System Resilience.

We note that these cover NLRE expenditure in both lead and non-lead assets, and believe that they should provide some reassurance to customers on accountability for delivering work volumes and outputs in return for allowances. We have a specific suggestion for Ofgem to test the accuracy of their proposed NARM target of a delta-risk reduction of £533m, against an industry-wide calibration.

Workforce Planning: SHET provided two appendices with their December submission, which set out general "good practice" and appeared to be written more in the form of consultation documents, and we are concerned that, based on our

review in the time available, there is a relatively weak link to resource plans. We would ask Ofgem to consider further.

Cyber Resilience: SHET are planning to spend £3.7m for Cyber Business IT. SHET state they will submit their Cyber Resilience Plan and funding request to Ofgem in spring 2021. Given other companies have submitted cyber plans, we are concerned that SHET is lagging behind other companies in developing their cyber plans and that some costs may not be included. SHET are proposing that any additional spend be addressed through an uncertainty mechanism.

We note that SHET plan says they will spend £54.1m on BAU business and operational IT. We have not reviewed these costs and are looking to Ofgem to evaluate IT costs to ensure cyber costs are justified over and above BAU costs.

12.6.3. Environment

A significant part of the SHET detailed material (and specifically the EAP, included within the Sustainability Action Plan) was only provided in the December plan and therefore our opportunity to make meaningful contributions has been limited. That said, there is evidence that some comments which we were able to make have been heard.

The main body of the final Business Plan contains a brief overview of objectives and targets, which we think could have been clearer on track record and targets, including cost of delivery. However, it is supplemented and supported by the Sustainability Action Plan, incorporating the EAP, which contains extensive material relating to SHET's environmental strategy, targets and proposed actions, which shows that considerable engagement and effort has been invested in sustainability. The material on local area plans and community energy is good, as is the programme of engagement with suppliers, including on biodiversity. Oil and noise pollution are addressed as well as waste. We note that the company has responded to stakeholder challenge by increasing its level of ambition in relation to both woodland net gain and visual amenity.

In the October plan we welcomed, in particular, SHET's recognition of the need for cultural change and a process of change management to meet its ambitions. It is welcome that governance and senior commitment is specifically addressed in the supporting plan.

There are some encouraging signs of ambition in relation to business carbon, although science-based targets still need to be set. Scope 3 target is to have two thirds of suppliers with a science-based target by 2025.

The targeted SF6 emissions reduction, which will be required to achieve the Scope 1 and 2 reductions of one third, is welcome but clearly ambitious: in the absence of earlier information it has not been possible to challenge whether the strategy and action plan are likely to be sufficient to achieve this. But initiatives like allowing the network to be used as a testbed by manufacturers for alternative insulating gases are commendable.

12.6.4. Bespoke ODIs

The plan contains what are described as bespoke CVPs, which we have characterised as reputational ODIs, relating to the environment and sustainability. No

biodiversity net loss for new projects reflects strong stakeholder emphasis on this aspect of SHET's activities and we think this could be more ambitious. We note that the plan contains further commitments to help to establish natural capital reporting across the sector to be implemented beyond 2025 with a long-term aim of achieving biodiversity net gain on projects. If these had been reflected in a reputational ODI there might be more grounds for recognition. The second output is a target for at least 5 projects to be submitted for approval under SHET's policy initiative on the Visual Impact of Scottish Transmission Asset (VISTA). This again is one element of a suite of targets and it is not clear that it is the one which will have the most impact although it will clearly be easy to measure and responds to stakeholder desire for SHET to be active in this space.

Two additional outputs arise from the sustainability agenda: first, a commitment to train all employees to recognise signs of consumer vulnerability and to have knowledge of relevant support services. This appears to have stakeholder support and reflect proportionate expectations of the way a TO can contribute in supporting vulnerable consumers. The final output is to support local supply chains by maintaining at least 25% of supply chain in the north of Scotland.

This again has strong stakeholder support and aligns with Scottish and UK government priorities but we do not feel a target of more than 25% is at all stretching given that it appears 27% of approved suppliers are currently registered in the network area.

12.7. Net Zero/Whole system

SHET describe reasonably clearly their whole-system vision / objectives at a high-level. The plan is largely focused on connecting low carbon generation (renewables) in the north of Scotland and consequent transmission needs. While this may in practice be SHET's main contribution to net zero, we think this needs further expansion.

The plan is built around SHET's "Certain View", which includes details of proposed generation projects. This is compared with various alternative scenarios.

The Appendix on Planning for Net Zero explains how SHET seeks to take a holistic approach and avoid "stranded investment". However, the plan is largely focused on electricity, with little attempt to demonstrate engagement with or understanding of issues for related sectors. There is a proposal to start whole system working across electricity transmission and distribution and for expansion to encompass other energy vectors to follow this but it is not clear what it is envisaged this would encompass and there is no sense of urgency in relation to addressing net zero on a holistic basis. Whilst it appears that in RIIO-2 SHET propose to establish whole system electricity network planning coordination and potentially explore other whole-system areas that will be then implemented in RIIO-3, only limited examples of whole-system propositions have been provided, and no cost-benefit analysis of whole-system solutions has been presented.

12.8. Digitalisation plans

In October, SHET provided a description of the proposed network asset investments to digitise network operations, including quantification of the numbers of protection schemes, control systems, communications upgrades etc. to be delivered. Beyond

digital interventions that physically “touch” the network, the Plan appeared limited on initiatives to digitise the Business’ interfaces and processes that interact with stakeholders, customers, and the market. The plan did not provide confidence that its ambitions and plans would be delivered e.g. the development plan for the asset management system was not described.

In the final plan, the overall high level vision is again good with a strong stakeholder focus. However, this remains quite high level and not looking outside SHET’s own business. Two big digital initiatives identified in this period are a new control centre and remote time modelling/twin. In the limited time we have had to review this, we think the delivery cost and timescale appears high level with a lumpy cost profile to 2026 and we invite Ofgem to investigate further.

It appears that SHET have recently established a separate digital team and there appears to be much work to do to turn this into something deliverable. The plan gives some, but not much, flavour of where they are now vs where they need to be. We note that SHET already have some sort of operational digital twin going with NGET and ESO, and it would be useful to better understand this initiative and its potential.

The plan shows good consideration of cooperation within the industry, network utilities and industry bodies, but could do more to demonstrate engagement with disrupters, start-ups, and working across sectors. However, we welcome the ambition of the digital vision model piece they have outlined and the focus on what others need from SHET.

12.9. Managing Uncertainty

SHET has provided some detail about its uncertainty proposals, covering cost pass through, reopeners, unit cost adjustments (UCA), and volume drivers.

Figure 5.1 Our uncertainty mechanisms

Four key proposals relate to LRE and are shown in Table 1 below.

Table 1. Main LRE uncertainty mechanisms

Main LRE Uncertainty mechanisms	**Baseline**		**Estimated maximum additional cost adjustment**
Volume Driven			
Generation and Demand-related Infrastructure	£891m		£1.27 bn[21]
Unit Cost Adjustment (UCA)			
Operability and System Management (Shunt reactors and Inter-trips	n/a		n/a
Re-openers			
Load Related Strategic Wider Works	n/a		SWW Reopener would apply for any scheme >£100m. SHET expect the proposed SHET/NGET Eastern HVDC Link to go through the process during RIIO-2. Projects will also be assessed for delivery through competition.
High Value Transmission Projects	n/a		Annual reopener with £25m threshold would apply for projects <£100m. SHET cite the Skye project as an example.

[21] P9 of SHET's plan states that their assessment that the use of UM's may result in an additional £1.27 billion of expenditure in network growth over the RIIO-2 period. . SHET estimate is £400m were the "likely outcome" (13.2GW) to occur vs. a Base (11.2GW).

SHET has explicitly estimated the potential impact of several UMs, including the automatic volume driver for Generation and Demand Infrastructure is estimated to increase were the “likely outcome” (13.2GW) to occur vs. a Base (11.2GW). SHET has presented an analysis in support of relatively complex drivers, compared to those used in RIIO-1, which should improve their accuracy.

We suggest however that Ofgem seeks independent validation of the proposals and in particular ensures that they do not introduce any bias that might disadvantage customers. The proposal to retain a reopener for SWW >£100m seems appropriate, and we note the proposal for a new High Value Transmission annual reopener, triggered for Totex adjustments between £25m and £100m. SHET explain that this mechanism is required for schemes, such as Skye, where the potential solutions and associated costs are too uncertain to set an ex-ante allowance at the start of the RIIO-2 period. These sound like reasonable supporting arguments, provided that Ofgem is content that the balance of risk is shared fairly between parties and the potential benefit is not offset by the costs of managing the process. SHET has presented evidence that the uncertainty mechanism proposals are supported in principle by stakeholders.

SHET’s baseline plan expenditure and proposed allowances for LRE are based on what they describe as a “Certain View”, following engagement with stakeholders and a review of the probability that the selected projects are likely to proceed during RIIO-2. A high reliance is placed on the most recent results of the ESO NOA process, and given that three East Coast high value projects account for around half the total LRE, the Plan is sensitive to the needs case assumption and supporting EJPs. We are not convinced that these projects have been justified - it is suggested that Ofgem consider the balance of benefits between including those projects as proposed by SHET in RIIO-2 ex-ante allowances, versus applying the SWW process once they are more certain.

In addition to the uncertainty mechanisms discussed above, SHET is proposing a wide range of other mechanisms. We have concerns about a number of these, including:

- Pre-construction works, which we want to ensure does not duplicate work already in the baseline or in other uncertainty mechanisms. SHET state that it cannot as pre-construction is only for schemes not in the baseline – we would ask Ofgem to investigate further.
- Operating cost escalators, which seem to increase operating costs if third party SWW projects go ahead.
- Sustainability cost escalators, which seem to increase operating costs in association with other network investments.
- Brexit import tariff, which should be a normal business risk.
- Subsea cable faults, which can be insured by the company.
- HVDC centre, where we do not think consumers should fund any additionality.

We are unconvinced that these should be included, but if any of these are taken forward, they need to be considered in the round of risk apportionment between the company and customers. We are concerned that a number of proposed reopeners

may be regarded as covering risks that could be more efficiently borne by the company, or addressed through a different mechanism.

SHET has identified an RPE escalator of 0.46% of Totex which it has included in Totex forecasts rather than as an uncertainty mechanism. We do not think this should be included. Many of the costs that SHET has proposed e.g. workforce costs are under their control, and residual cost drivers are likely to fall below a materiality threshold. We don't think these costs should be included in RPE indexation.

12.10. Efficiency – innovation and competition

12.10.1. Innovation

SHET claim that circa £29m of innovation benefits have been realised during RIIO-1. SHET propose £8m of NIA funding for RIIO-2 (around 0.3% of Totex) to be supplemented by BAU funding and other third party funding. Half of this funding is targeted for SHET's stakeholder-led strategic theme. We think SHET could have been more ambitious in its innovation proposals.

12.10.2. Competition

The Business Plan identifies seven potential projects for early or late competition but concludes that none of them meet Ofgem's criteria for competition. A native procurement plan is provided, including commitments to publish an annual competition report and efficiency report, which is welcome. Given the scale of investment proposed across the entire SHET plan, more projects would be expected to be identified. We think that SHET should have been more proactive and identified projects suitable for competition that fell below the Ofgem criteria. For example, generator connection sole works could have been considered.

12.10.3. Efficiency/productivity

SHET's plan says it has included £100m of efficiency enhancements (circa 4% of Totex) in the Totex forecast including savings from unit costs, productivity, innovation and reduction in cost of risk. The plan also appears to include a baseline assumption for a 0.4% RPE increase[22]. Recognising the limited time we have had to review SHET's plan, we are concerned that there is no clear indication of where it is captured in Business Plan forecasts and we ask Ofgem to investigate further. We think there is scope for significant efficiency improvements on the Plan forecasts.

12.11. Costs

12.11.1. Forecasting and Scenarios

The plan outlines a number of potential future scenarios based on the FES, the ENA core scenario and SHET's own future energy scenarios. For existing and new generation in the north of Scotland the range of potential outcomes in 2025/26 varies between 8.6GW and 15.7GW. SHET state that their Certain View is consistent with the ENA Core scenario, after adjusting for the presence of Peterhead Power Station. The ESO FES and SHET's Certain View differ in this respect, but we note SHET say

[22] P65 of SHET's plan says an overall RPE escalator of 0.46% of total expenditure which we have applied to our Certain View'.

that their proposed LRE would be the same against both Views. We would ask that Ofgem investigate these implications of this difference further.

Investments in the plan have been those that a) have been given a consistent proceed signal in NOA, b) sole/shared use investments that have already commenced, c) five other investments with strong evidence of certainty now, and d) preparatory design and development work to enable future investment options. This is presented as SHET's Certain View. We have concerns whether the NOA has provided sufficiently robust information to support SHET's view.

12.11.2. Costs - the SHET Plan

Ofgem's planning guidance requires companies to justify costs, including cost drivers, consideration of options, and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

The SHET plan proposes Totex expenditure of £2,356 million for the RIIO-2 period as shown below. This has increased by around £200m from the £2,161 million proposed by SHET in their July and October 2019 draft plans. The SHET plan expenditure summary breakdown is set out in Table 3 below.

Table 3. SHET expenditure summary

	Expenditure (£m)	Main Outputs[1] by 31 March 2026 (or annual, where stated)
Building a Network for Net Zero		Pages 29-48
New Sole-Use Infrastructure for onshore and offshore generation[1]	77.2	2,043 MW[1]
New or Upgraded Shared-Use Infrastructure	124.3	2,047 MVA
New or Upgraded Strategic Infrastructure	560.4	1,090 MW on B4*
Pre-construction	129.1	Undertaking all necessary development activities (e.g. options assessment, environmental studies, consents) to enable timely construction. Includes five early stakeholder engagement events per annum
Maintaining and Investing in the Existing Network		Pages 49-66
Replacing or Refurbishing Existing Network Assets	810.2	533 £Rm monetised risk reduction (relative to no intervention)
Direct Operations	87.3	Annual average Energy Not Supplied <90 MWh
Indirect Operations**	29.5	72 faults of all durations with no exclusions Upper quartile in international benchmarking for (i) operations and maintenance, and (ii) asset management
Security of Supply		Pages 67-78
Refurbished or Upgraded Protection and Control	65.0	64 protection schemes 33 real time control units
Improved Physical Site Security	33.9	23 deterrence schemes (e.g. fencing) 55 defence schemes (e.g. CCTV, alarms)
New and Upgraded Warehousing and Spares	53.6	2 specialist warehouse facilities
New and Upgraded Network Control Centre	16.3	1 new network control centre and back-up facility
New Smart Monitoring of Critical Assets	45.4	62 critical assets
Other	58.4	116 substations capable of 120 hour stand alone operation Compliance with Persistent Organic Pollutants regulations
Data, IT and Analytics	57.8	Business IT and Operational Technology, and enhanced cyber security
A Sustainable Network for Current and Future Energy Consumers		Pages 85-103
Customer and Stakeholder Engagement, including Connections	17.3	100% of connection offers made on time >9.0 out of 10 in stakeholder engagement annual survey Annual reporting under Enhanced Reporting Framework
Sustainability Policy and Reporting	9.7	33% reduction in scope 1 and 2 GHG emissions Annual average SF6 gas leakage <0.39% Five projects to improve visual amenity submitted
Other Expenditure		Pages 106-108
Indirect Operations	93.6	Activities that support network operations such as System Planning and Regulatory Reporting
Business Support	87.1	Back office activities such as such as Finance; Risk, Audit and Assurance; Legal; Regulation; HR; Corporate Affairs; and Property Management
	2,356.1	

In our feedback to SHET on their July and October draft plans, we commented that we were concerned that their forecasts were unjustified and were higher than necessary. Capex and Opex expenditure forecasts were not built on evidenced costs and volumes.

On NLRE, we noted that they were seeking to improve asset condition data to improve the certainty of the investment programme while at the same time forecasting increased NLRE for RIIO-2. We were concerned that benefits for consumers of this additional expenditure were not justified. The absence of evidence from Engineering Justification Papers, third party review or detailed cost benchmarking, made it impossible to verify expenditure claims with any confidence.

Given that SHET had forecast a significant increase for its RIIO-2 non-load expenditure, we were concerned that this would lead to higher than necessary price control allowances for RIIO-2. We also asked SHET to perform sensitivity analysis on certain elements of their Totex forecast.

In undertaking our evaluation of the final SHET cost forecasts, we have used the key cost elements that are reported consistently by SHET to Ofgem over price control periods and provided by SHET in their RIIO-2 business plan data templates, which are set out in the table below. This gives a total of £2,402 for RIIO-2 which appears comparable with SHET's above breakdown of expenditure.

We have compared the RIIO-1 average expenditures with the RIIO-2 forecast expenditures as shown in Table 4 below. For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Table 4. RIIO-1 to RIIO-2 SHET Cost Comparison[23]

Scottish Hydro Electric Transmission Cost Category (£m)	RIIO-1 Average	RIIO-T2 Average	RIIO-2 Total	% Change
Local Enabling (Entry)	90	71	356	-21%
Local Enabling (Exit)	3	-	-	-100%
Wider Works	185	93	466	-50%
LRE - sole-use Local Enabling (Exit - Sole Use)	9	-	-	-100%
LRE - sole-use Local Enabling (Entry - Sole Use)	1	3	16	276%
TSS Infrastructure	0	-	-	-100%
Total Load Related Costs	288	168	838	-42%
Replacement	45	155	773	245%
Refurb	0	0	0	-16%
Non-Load Other	0	12	58	
Total Non-Load Related Costs	49	173	863	256%
Non-Operational Capex	3	22	112	642%
Total Network Operating Costs	19	42	208	123%
CAI	38	51	255	36%
Business Support	14	21	105	55%
Total Other Costs Within Price Control (Placeholder post May 2019)	4	4	20	-3%
Total Costs within Price Control	414	480	2,402	16%

Highlights from this comparison are that load related expenditure (LRE) shows a 42% reduction but remains at a significant level (£838m) and non-load related expenditure (NLRE) has increased by 256%. There are also significant increases in all other expenditure areas. However, we note that SPT advise us that some of the above expenditure categories are calculated on a different basis between RIIO-1 (due to uncertainty mechanisms) being included and RIIO-2, where they are not. We request that Ofgem investigate this further.

In seeking to understand SHET's justification for these expenditure items, we have not sought to reconcile the differences between the expenditure categories and justifications set out in SHET's plan and the Business Plan data templates submitted to Ofgem (which will be a matter for Ofgem's analysis) but have focused on the justifications for expenditure in the SHET plan as detailed below.

12.11.3. NLRE (£863m)

For NLR, it is welcome that SHET have named the 28 asset replacement schemes they propose to carry out, as this provides customers with some assurance that the Plan is built on identified "work on the ground". But due to the late submission of this volume of documents to us compared with other companies, we have only been able to undertake a high level review. It has not been possible to assess the robustness of the evidence for interventions, cost benchmarking and asset health information but we expect Ofgem to undertake more detailed analysis in this area.

[23] We note that the RIIO-2 total for Non-load related costs in the above table using data taken from SHET's business plan submission does not appear to summate to the individual elements and would ask Ofgem to examine further.

In assessing NLRE, we have focused on comparing SHET's cost and volume forecasts with current run rates for asset replacement. For RIIO-2 NLRE expenditure, we have used the SHET narrative that accompanies their Business Plan Data Templates (BPDTs) to evaluate the changes to expenditure and volumes by asset type that have taken place between RIIO-1 and RIIO-2.

The following NLRE tables include capitalised indirect costs as well as direct costs so are gross costs and are not directly comparable with the overall cost comparison shown above.

12.11.4. NLRE cost comparison

The following Table 5 shows the changes between the actual average expenditure for the first five years of RIIO-1 compared to the equivalent forecast for RIIO-2. The RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Table 5. RIIO-1 to RIIO-2 SHET NLRE Gross Cost Comparison

Funding Category £m	RIIO-1 Business Plan	RIIO-1 Actual & Forecast	RIIO-1 Actual & Forecast Average	RIIO-1 Actual Average	RIIO-2 Total Forecast	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change	RIIO-1 5yr actual to RIIO-2 change
	(8 yrs)	(8 yrs)	(8 yrs)	(5 yrs)	(5 yrs)	(5 yrs)	(%)	(£m)
Transformer	59	46	6	3	103	21	587%	18
Reactor	0	18	2	3	2	0	-87%	-3
Circuit Breaker	18	13	2	2	242	48	2320%	46
Cables	12	12	2	2	128	26	1180%	24
OHL Conductor	109	233	29	13	279	56	329%	43
Protection & Control	7	6	1	1	41	8	720%	7
Other TO	58	36	5	5	15	3	-40%	-2
Total	**263**	**364**	**46**	**29**	**810**	**162**	**459%**	**133**

The table shows an overall increase of 459% above current expenditure levels, with an average annual increase of £133m p.a. This would equate to an additional expenditure of some £650m in total for RIIO-2 above the current RIIO-1 run rate. There are major increases across most asset areas with very significant increases in a) circuit breakers, b) transformers, c) overhead lines and d) protection & control. We break down the volume and unit cost increases below.

Also, the 8 year (actual plus forecast) RIIO-1 average is significantly higher than the 5 year actual average, indicating that SHET anticipates significantly accelerating asset replacement/refurbishment expenditure in the last years of RIIO-1. SHET point out that,In the context of total capex, total capex is declining in final years of RIIO-T1 due to a reduction in load related expenditure and at the end of RIIO-T1, there is a heavy NLRE overhead line focus which is more expensive.

SHET's RIIO-1 Business Plan outturn expenditure is currently estimated to be £90m higher than forecast at the start of RIIO-1, we would question whether this back-end profiling of an 8 year programme of RIIO-1 NLRE expenditure is efficient given the requested major increase in NLRE expenditure for RIIO-2.

12.11.5. NLRE Volume and unit cost comparison

SHET's volume forecasts for activities on key assets are shown in Table 6 below, comparing average annual volumes for the categories that SHET have identified between RIIO-2 and the first 5 years of RIIO-1. The RAG ratings highlight the range

of highest increases (red) to highest reductions (green).The table shows a significant volume increase for overhead line supports and for circuit breakers in particular.

Table 6. RIIO-1 to RIIO-2 SHET NLRE Volume Comparison[24]

Volumes No. unless stated	RIIO-1 Business Plan	RIIO-1 Actual & Forecast	RIIO-1 Actual & Forecast Average	RIIO-1 Actual Average	RIIO-2 Total Forecast	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change	RIIO-1 5yr actual to RIIO-2 change
	(8 yrs)	(8 yrs)	(8 yrs)	(5 yrs)	(5 yrs)	(5 yrs)	(%)	(£m)
Transformer							78%	
Reactor							100%	
Circuit Breaker		Redacted for commercial sensitivity					471%	
Cables (km)							133%	
OHL Conductor (km)							-36%	
OHL Fitting (km)							130%	
OHL Support							>100%	

Based on data in the above tables, we have also compared actual unit costs in the first 5 years of RIIO-1 with the RIIO-2 forecasts. These are shown in Table 7 below for the categories that it has been possible to compare. The RAG ratings highlight the range of highest increases (red) to highest reductions (green).

Based on this comparison, it would appear that unit costs are increasing significantly for most asset types, some by around 5 times, and we are concerned that evidence does not appear to have been provided to justify this major increase. SHET state that this comparison is inaccurate because civil and other associated costs are included in the totex. We ask Ofgem to investigate this further.

Table 7. RIIO-1 to RIIO-2 SHET NLRE Unit Cost Comparison

Unit Costs (£m/unit)	RIIO-1 Actual Average	RIIO-2 Average	RIIO-1 5yr actual to RIIO-2 change
	(5 yrs)	(5 yrs)	(%)
Transformer			286%
Reactor	Redacted for commercial sensitivity		-93%
Circuit Breaker			324%
Cables			449%
OHL Conductor			572%

12.11.6. NLRE Justifications

We have examined the justification for some of these cost areas in more detail.

- Transformers and Reactors – we are concerned that the increase in transformer numbers may be partly driven by decisions to separate generation and transmission sites. We are concerned that this will lead to the unnecessary replacement of transformers and that alternative solutions have not been fully evaluated. The unit cost increases appear high compared to RIIO-1.

[24] All volume and unit cost figures provided to Ofgem by SHET in their business plan submissions.

- Circuit breakers – we are concerned that the increase in circuit breaker replacements may not be necessary, and options such as refurbishment have not been justified. The unit cost increases appear high compared to RIIO-1.
- Overhead lines, fittings and tower supports – we are concerned that the need case for the scale of proposed intervention on overhead lines, fittings and towers is based on limited asset data and may not be justified. Options for deploying modern condition monitoring technology do not seem to have been fully considered. Again, unit costs show a significant increase from RIIO-1.
- Efficiency – we note that a risk contingency is included of between 8% to 14% per project, which has inflated the expenditure forecasts. The unit costs show a significant increase from current levels. We would encourage Ofgem to investigate the scope for additional efficiencies in NLRE.

Overall, we were disappointed that the majority of asset health information for SHET was only provided in their December plan, giving us limited visibility of potential evidence to support the spend levels. We ask Ofgem to investigate SHET's justifications across all the above areas.

Overall, we consider the costs, volumes and timings are highly uncertain and we have low confidence in them.

12.11.7. LRE (£891m)

SHET's plan proposes £650m of expenditure on baseline wider works and £108m of generator connections (including sole and shared use). The plan also outlines further expenditure that may be required for generation, demand, baseline wider works and strategic wider works. It will be important that appropriate uncertainty mechanisms are designed to protect consumers from outcomes that unduly benefit the company.

12.11.8. Baseline wider works (£650m)

These include North East 400kV and East Coast phase 1 and 2, comprising 11 individual projects. Some of these projects appear to be proposed ahead of the earliest in service dates required in the latest NOA. All of these project evaluations should consider if alternative solutions are available e.g. use of modern technology, flexibility providers or DNO's, or whether competition may be used for these projects.

12.11.9. Pre-construction expenditure

It would appear that an allowance of circa £130m is expected for RIIO-2 preconstruction work. Our understanding is that SHET is proposing a use-it-or-lose it allowance to be part of the baseline, subject to an end-of-period efficiency disallowance test. If this is taken forward, we believe that further scrutiny by Ofgem of the level of baseline allowance will be necessary.

12.11.10. Efficiency

Design solutions and unit costs will need to be assessed by Ofgem for all of these projects if they are to be part of the baseline. Risk margins of 8-14% are understood to be included in project costings which should also be addressed as part of the evaluation.

12.11.11. Non-operational Capex (£112m)

SHET's proposal is for £112m, an £88m increase from RIIO-1. It includes IT expenditure together with expenditure that we understand includes new warehouses and a new control centre. We have not examined this justification in detail due to time limitations, but are concerned that both BAU expenditure and any additional IT expenditure should be justified.

12.11.12. Overall IT Costs

SHET's Plan proposes IT that total £92m, including Cyber, Business Support Costs, Closely Associated Indirect costs, and Non Operational Capex. We have not examined these costs and look to Ofgem to consider the justification for these costs.

12.11.13. Opex

SHET's Opex submission proposes the following expenditure for RIIO-2, totalling some £568m. The main elements are:

12.11.14. Network Opex

This is forecast as £208m, comprising £105m direct Opex and £103m for operational protection. Annual costs have more than doubled from the RIIO-1 8 year average. It is claimed that costs have increased due to the HVDC circuit operational costs and increased civil works with other sites. We note that £27m is planned to be spent on replacing 86 protection schemes in addition to those in other justification papers, which appears excessive.

SHET has provided several appendices with supporting evidence. We think these need cases and efficiency need to be examined by Ofgem. We are concerned that protection and control costs appear excessive and are difficult to assess as they are presented across several different cost areas.

12.11.15. Indirects

These total £360m, including £255m for Closely Associated Indirect costs (CAI), an increase of circa 35% on RIIO-1. This is largely justified in the plan by increased HVDC work and a more complex network. Business support costs increase by around 55% from the RIIO-1 8 year average to £105m, justified in the plan by having a larger and more complex network. SHET state that the greater complexity will be driven by greater generation and associated network growth.

We would question whether the network will become much more complex than it currently is, and therefore we question the need for additional resources. SHET has provided justifications for these cost increases and we ask Ofgem to investigate further.

12.11.16. Efficiency

It is not easily evident that efficiency savings have been included in these forecasts. We note that expenditure across all Opex categories for SHET in 2018/19 was £68m, compared to SHET's annual average forecast for RIIO-2 of £114m, around 40% lower. SHET has provided justifications for these increases and we ask Ofgem to investigate further.

12.11.17. Totex sensitivities

In August 2019, the CG asked SHET to provide two downward sensitivities for Totex forecasts in their October plan. These were not provided.

12.11.18. Cost Summary

SHET provided weak evidence in its July and October plans in response to our requests for expenditure justifications, and we were disappointed with the level of response to our requests. We received engineering justifications and other supporting information for the first time in their December plan, which we have reviewed to the extent possible in the time available.

We have considered evidence to justify a) the need case, b) the type of intervention, c) whether unit costs are efficient, and d) whether the expenditure was previously claimed under RIIO-1 and customers have already funded it.

Overall, we find the justification for expenditure in the SHET plan to be variable and have identified the following areas of concern for Ofgem to probe further.

- The “whole site” approach to non-load related expenditure which may not be the most efficient.
- The scope and timing of load related reinforcement expenditure appears uncertain.
- Opex expenditure is forecast to double from current levels and when we reviewed the October Plan the justification for this was weak. SHET provided further information in December which they say justifies this increase. We suggest Ofgem reviews those in detail.
- Efficiency benefits are not easily identifiable, and it is unclear how stretching SHET’s cost benchmark targets are. Unit costs appear to be increasing significantly without any justification.

Overall, we have concerns across Capex and Opex expenditure that these forecasts are not built on evidenced costs and volumes. On NLRE, we understand that SHET have made progress to improve their asset management systems and condition data during RIIO-1, but that work is still required to improve their asset management capability in RIIO-2. Forecast NLRE for RIIO-2 is increasing and we are concerned that benefits for consumers of this additional expenditure has not been fully justified or optimised across asset categories. SHET propose to carry out their NLRE investments across 28 named schemes, and have included a mix of different asset categories i.e. overhead lines, switchgear, and transformers, within the engineering justifications. This raises a concern that some asset replacements may be being brought forward ahead of need to fit with their “whole site” approach”.

Because of the sharp increase and nature of the justifications, we are concerned that SHET forecast costs for RIIO-2 may be significantly higher than necessary.

Overall, we have low confidence in SHET’s cost forecasts.

12.12. Engineering Justifications and CBA

SHET’s plan in October was significantly incomplete, and there were no EJPs submitted. The final plan now has 51 Engineering Justification Papers covering all of

the key proposed investment. In the resulting limited time available to us, we believe that they provide most of the information required to assess the Plan.

There is evidence of proposals being based on asset-specific data and considering options for intervention, albeit sometimes limited. A key concern on the justifications is whether by grouping all NLRE asset interventions into “geographic” schemes, opportunities are being missed to trade risk between assets in the same class and between asset classes. There is also a concern that work may be being advanced ahead of need. We recognise however that there are efficiencies in site establishment and outage costs in grouping work required at one location into a single project, and therefore suggest that Ofgem seeks evidence, perhaps by way of CBA, to show that the potential benefits from grouping work (as opposed to managing risk by asset cohort) outweigh any value loss from advancing works before need.

12.13. Finance

We have evaluated the financeability section of SHET’s plan against adherence to Ofgem’s financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement both with appropriately qualified consumers and our prior feedback in relation to financeability. Note that our analysis of the December Plan does not include commentary on compliance with Ofgem’s WAs.

SHET’s July Plan was in our opinion non-compliant with Ofgem’s Business Plan Guidance in a number of respects. It failed to include any assessment of financeability using Ofgem’s 4.8% cost of equity assumption and included no detailed assessment of the financeability of the Actual Company. Sensitivity analysis was very limited. We also noted that there was no detailed engagement with consumers in relation to trade-offs in individual elements relating to financeability.

There was evidence in October of some limited engagement with our commentary but the Plan still fell short in a number of important respects. No modelling results were shown for the Actual Company and none of the sensitivity analysis required by Ofgem was presented. SHET was targeting a BBB+ rating (for the Notional Company: there was no separate analysis for the Actual Company). The Plan stated that this was unlikely to be achievable on the basis of Ofgem’s working assumptions for Cost of Capital allowances but there was no evidence that mitigating actions to improve financeability were at the lowest cost to the consumer: the only mitigating action proposed was an increase in the Cost of Equity allowance to 6.9% (real CPI/CPIH) which we made clear to SHET we considered considerably higher than necessary to make the Notional Company financeable. There was still no evidence of detailed engagement with consumers in relation to individual financeability issues.

In our view the December Plan implies (although there is no explicit statement) that it would not be financeable at a BBB+ rating on either a Notional or an Actual basis using Ofgem’s WAs without applying mitigating actions in the form of both an 86% capitalisation rate and 55% (against a 60% Ofgem WA) gearing. We do not consider that these proposed mitigations have been drawn up with a view to minimising costs to the consumer (they appear to us to be more focused on supporting the Company’s case for a 6.5% Cost of Equity allowance). For example, the Company has based its suggested mitigating actions on a case in which, unlike the Ofgem

Business Plan Guidance, the Cost of Equity allowance is 4.3% without the 50bp outperformance assumption. Even on the basis of a 4.3% Cost of Equity allowance, the credit ratios for both the Notional and the Actual Company appear to us to be well above the thresholds required by Moody's for a Baa1 rating once the mitigating actions have been applied (in fact in our view financeability could be achieved by lowering the capitalisation rate to 86%, which SHET say is their implied natural capitalisation rate under their 'certain view' scenario, so may not be considered a financeability adjustment).[125] No analysis has been provided as to the impact (inter alia on the proposed change in the capitalisation rate) of including the 0.5% outperformance assumption i.e. with a Cost of Equity allowance of 4.8% . The Company makes the assumption that rating agencies would not accept a change to the capitalisation rate but this does not appear to have been fully explored by SHET which would have been helpful, especially in the light of the anticipated slower rate of asset growth in RIIO-2.

The Plan still shows no evidence of detailed engagement with consumers on specific issues relating to financeability and in particular the various trade-offs that those imply. We can see the reason for having headroom in target ratios over the minimum required to maintain an investment grade rating (BBB-), but we have not seen either evidence of consumer support that BBB+ is a better value target than BBB or quantitative analysis of the costs and benefits to consumers of targeting ratings at the various levels.

SHET's December Plan indicates a greatly improved level of engagement with our commentary and now shows much of the analysis required by the Business Planning Guidance. However, it has used the financeability section of its plan to make a case for a higher Cost of Equity allowance and we found little evidence of a focus on achieving financeability on the basis of lowest cost to the consumer.

12.14. Consumer Value Proposition (CVP)

SHET did not submit a CVP in its draft October plan so we did not have the opportunity to engage with a previous draft or provide any challenge. The same timing issues meant that the User Group had limited opportunity to provide feedback and noted in their report that they were not able to verify the stated benefits of the quantitative proposals.

We recognise that SHET has sought to build a coherent CVP around key themes and has brought the proposals together in a clear supporting document. Their User Group has confirmed that the various elements of the CVP go beyond minimum requirements and have stakeholder support, both for specific proposals and for ambition in the relevant areas. However, the specific proposals put forward by the company cover things which will be adequately incentivised under other mechanisms and should not also be rewarded upfront or, in our view, do not look to be best in class or go beyond BAU for a network company. Examples of these include SHET's use of historic costs to derive unit cost allowances, the use of Certain View and associated commitments to return unspent allowances, the commitment to early

[125] We also note that the company's financeability assessment appears to have been based on its own model, rather than Ofgem's and that the company states its own model shows lower ratios than Ofgem's (by about 25bp for AICR) which it attributes primarily to the fact that its model uses accounting form ratios while it asserts that the Ofgem model uses economic form ratios which SHET considers inconsistent with those used the Credit Rating Agencies. (This issue has not been raised by other network companies).

engagement on future of energy scenarios and strategic network development and the three initiatives relating to connections. In relation to the latter we note that these had strong stakeholder support and were a response to active engagement but do not consider that they are sufficiently beyond the performance frontier to justify recognition under CVP unless Ofgem's benchmarking suggests they deliver substantially more than comparators.

We have discussed under 'environment' the bespoke CVP outputs which relate to environmental impact. The targets highlighted as CVPs in the CVP annex are slightly different from those identified as CVP outputs in the summary tables, which has made it difficult to form a view on the strength of the proposals put forward in this area. In any event we think that proposals in this area need to be benchmarked so that the best in class which are truly delivering additional value above reasonable expectations can be identified. Biodiversity net gain and visual amenity are areas which SHET has placed considerable focus on but it is not clear to us that its proposals are sufficiently ambitious to be characterised as delivering additional value.

13. Company Report - Wales & West Utilities (WWU)

13.1. Summary

The following table sets out our rating for the WWU final December Plan, together with the average ratings we have given WWU during the stages of preparation of its Plan.

Table 1: WWU Business Plan evaluation

Plan theme	Plan preparation	December plan	Plan theme	Plan preparation	December plan
Track record from RIIO-1			Digitalisation plan	n/a	
Business plan commitment/assurance	n/a		Efficiency		
Stakeholder engagement			Uncertainty mechanisms		
Outputs: vulnerable consumers			Costs		
Outputs: customers			Engineering Justification/CBA		
Outputs: resilience			Finance		
Outputs: environment					
Towards NetZero/Whole System					

Rating
Green
Amber/Green
Amber
Red/Amber
Red

Plan preparation ratings – we gave RAG ratings to the companies as part of our feedback after receiving their October Plans. It reflected our view of the quality of the evidence and proposals that they provided to us in their October Plan and during its preparation. Green ratings indicated that we thought the evidence was good, ranging to red where we thought it was poor or incomplete. In some cases, we subsequently adjusted the October RAG ratings in the light of our meetings with the companies, deep dives on costs and further information.

December plan ratings – our RAG ratings on the companies' final December Plans take account of the requirements of the Ofgem Business Plan Guidance. Green ratings indicate that we think the evidence provided in the plan is good and the company proposals are acceptable, ranging to red where we think the evidence provided is poor and the company proposals are not acceptable. Our explanatory comments are provided in this report.

13.2. Plan Highlights

- **Costs**: WWU expects to underspend its Totex by 19% in RIIO-1. Its average Totex is forecast to increase by 5% between RIIO-1 and RIIO-2, largely driven by an increase in Repex costs. WWU is forecasting a 0.5% p.a. efficiency increase and is proposing a range of bespoke uncertainty mechanisms.
- **Outputs**: all output targets are expected to be met or exceeded in RIIO-1. WWU is proposing seven bespoke outputs, which appear to be funded from the baseline Totex.
- **Financing**: WWU states that its Notional Company is financeable for the duration of the RIIO-2 period at a rating of BBB+ on the basis of Ofgem's Cost of Capital WAs, without the need for mitigating actions.

13.3. Track record

Ofgem's Business Plan Guidance requires an explanation of RIIO-1 outputs, Totex and return track records. This section sets out our observations and assessment of information provided by the company on these areas.

RIIO-1 Outputs: Ofgem's latest GDN performance report shows that WWU should meet or exceed all the output targets set for it during RIIO-1.

RIIO-1 Totex: the Plan explains the transition from RIIO-1 to RIIO-2 and shows that WWU expects Totex outperformance to be £421m below the allowance of £2219m, a 19% underspend. £187m of benefits were identified from competition, especially a lower cost mains replacement contract. Other efficiencies were gained from workforce productivity improvements, and by minimising asset replacement expenditure. WWU states that it has no delayed costs or deferral of work into RIIO-2, and that prior efficiencies will be carried forward where possible.

RIIO-1 Returns: WWU expects to earn 9.4% RORE over the RIIO-1 period and explains the key drivers of these returns and the level of distributions to investors over the period.

13.4. Business Plan Commitment and Assurance

Although difficult to find (because located in an appendix which appears to relate the assurance only to ambition), the Board Assurance Statement in the WWU Plan is

generally of good quality. It describes the governance arrangements surrounding the development of the Plan in some detail and contains a clear statement, signed by the chairman and explicitly on behalf of the full board, that the Plan is ambitious and deliverable and likely to meet all statutory and licence obligations. There is a clear statement that 'financeability has been achieved' which we regard as unhelpful. The reference is to the 'WWU business plan' (with 'business plan' in lower case, as it is in the Financing Section of the Plan i.e. not readily identified as being based on a very specific Cost of Capital allowance wholly at variance with Ofgem's WA for Cost of Capital). The statement that 'financeability has been achieved' must therefore be understood to be strongly conditioned. We consider it would have been helpful to make clear the implications of that caveat.

Extensive external assurance work has been commissioned in support of the board statement. KPMG has conducted a wide-ranging review focusing on compliance with Ofgem's Business Plan Guidance and Sector Specific Methodology Decision and with feedback from ourselves. Caveating of the report is no more than to be expected and the output is, in any case, reflected in the explicit Board Assurance Statement. Oxera has reviewed the efficiency of costs submitted; its report, together with that from KPMG, has been appended. There are a number of other independent reports, also appended, (for example in relation to Finance and Procurement, People and Engagement, IT).

The Business Plan Commitment section of the Executive Summary contains the brief statement that executive and management team bonuses will be 'closely aligned' with delivery of GD2 commitments, with up to 50% of executive bonuses attributed to those commitments.

13.5. Stakeholder Engagement

WWU made significant changes to its engagement approach during the course of developing the plan. These were positive changes, but the resulting timetable meant that a number of important elements, including the results of work to triangulate stakeholders' views and acceptability testing, were not incorporated into the Plan until the December draft. This meant that it was difficult for us to scrutinise the Plan in the round as fully as intended.

The engagement undertaken to develop the Plan is acceptable, trade-offs are discussed and it is reasonably clear how the results of engagement have influenced the Plan's proposals. We could not see a clear statement of the overall results of acceptability testing for the Plan, although scores are given on a chapter by chapter basis.

The future strategy is a clear enhancement on WWU's RIIO-1 approach and meets the principles set out by Ofgem. A strong element is the commitment to 'co-determine solutions' with customers and consumers via a new 'citizens panel' as well as an evolved critical friends panel. The costs of future engagement are given as an average of £1.1m per annum, an increase from an annual average of £0.6m during GD1. WWU says that these costs are included in the baseline and that it will use its social return-on-investment approach as well as audits against the AA1000SE standard to assess value for money. There are many positive elements in WWU's approach in this area but our Amber rating reflects the fact that the strategy is a significant step-up for the Company and so will inevitably take time to embed.

Earlier drafts of the Plan proposed a bespoke financial incentive to ensure that the company maintains the higher quality of stakeholder engagement used to develop the Plan. We welcome the fact that, although this commitment to enhanced engagement remains in the final Plan, the incentive proposal has been withdrawn.

13.6. Outputs

WWU has provided seven bespoke outputs in addition to those required by Ofgem's Sector Specific Methodology. One of these is identified as a price control deliverable, four are ODI-F, and two are ODI-R. Funding for the underlying activities is included in the baseline. Three of the ODI-Fs relate to enhanced compensation payments which the plan says are excluded from Totex.

We welcome the fact that output funding is included in the baseline Totex, but are concerned that the lack of specific justification may lead to duplication of costs and inefficiencies. We would ask Ofgem teams to investigate further to ensure that these outputs are appropriately targeted and offer value for money.

13.6.1. Customer Outputs

WWU's customer service ambition is a modest improvement on its current performance levels: it suggests an average of 9.2/10 for GD2 compared with its average score of 8.6 during GD1. We think this is acceptable given the standards WWU already achieves, and the fact that the new methodology being developed may require it to raise its game in order to achieve the same results. There is also a welcome focus on improving data capability to help the company target its efforts on its 'worst-served' customer groups (which WWU defines as customers who give a score of less than 7/10 in its customer satisfaction survey).

Costs for customer service and the national emergency line are maintained at GD1 levels, but there is an additional £1m compared with GD1 included to fund customer support officers over the period of GD2 (£0.17m rising to £0.38m per annum). WWU has clarified that it has already recruited nine of these ten new posts. The case study on the customer support officer trial suggests that this initiative drove improvements in both customer service scores and complaints figures. The October version of the plan did not commit to a customer service target improvement to reflect the impact of this additional investment but we note that the final plan does do this. However, there does not seem to be a similar additional uplift factored into the complaints performance.

The plan proposes an average response time for unplanned interruptions of 'below 10 hours', which is longer than the current equivalent performance (an average of 9 hours, including large events). However, we are aware that Ofgem has asked companies to propose the minimum acceptable standard in this area, which is not necessarily the same as the level of performance that should be delivered over RIIO-2. WWU also proposes new bespoke incentives in this area, with a voluntary enhanced payment of £25 if an interruption lasts longer than 12 hours, and £20 if the Company fails to attend a property within two hours of a call or an agreed appointment. The voluntary commitments are welcome if shareholder backed, but the targets in this area do not seem stretching.

WWU proposes a number of bespoke outputs in this area. As well as the enhanced unplanned interruptions payment, these include extending the scope of its compensation payments to groups not covered by the connections standard, doubling the penalty payment if it misses various general standards, and continuing with its ICS service mark. The level of stakeholder support for these initiatives, particularly the higher penalty payments, seems reasonable and they are supported by the CEG.

13.6.2. Vulnerability

The Plan that WWU has submitted does not propose to push its service provision for vulnerability far from the levels it achieved in GD1. Overall spend is lower, with headline spend at £2.68m per annum versus £3.08m in GD1. Although some of this lower spend may come from efficiency, it also reflects some areas of lower ambition. Overall, though, we consider this to be a well-evidenced approach in which there is a good understanding of the needs of WWU's customers and the drivers of vulnerability in its network areas. The use of SROI to articulate benefits is a highlight. Another positive element is the commitment to regional roadshows as well as the annual stakeholder event. This goes a step further than most other GDNs. There is good use of consumer, stakeholder and CEG views, and evidence of WWU's engagement with challenge from the CEG. The consumer vulnerability and carbon monoxide areas stand out as well developed and evidenced.

In October we highlighted the level of ambition on the Fuel Poor Network Extension Scheme which was lower in GD2 than in GD1. This area has improved in the December Plan, although the overall level of ambition is not increased, despite a quoted benefit-to-cost ratio of 12:1. The December Plan has improved the articulation of costs in most areas, but there is still no cost provided for in the Plan in relation to the Consumer Vulnerability reputational incentive (whereas other GDNs have provided evidence for this).

In October, WWU proposed a bespoke output for an inclusivity standard which we welcomed and considered should benefit consumers although it needed further justification. The December Plan provides further details for the £15k of funding sought for this standard. WWU was the first GDN to achieve this standard in GD1, but NGN and SGN have now also attained it. WWU states that benefits to consumers are bespoke and best practice. However, these are similar to those proposed by SGN and NGN although they do not propose a reputational incentive. The penalty for not meeting the standard will be to return funding. We are not convinced that the justification for this funding meets the requirements for bespoke measures in Ofgem's Business Plan Guidance.

13.6.3. Resilience outputs

Asset resilience: WWU's July and October plans contained reasonable information about how asset resilience would be assured during RIIO-2.

WWU's December business plan sets out the company's views on asset health, criticality and replacement priorities. This forms the foundation of the Totex plan.

The plan sets out a reasonable approach for delivery of a resilient network. However, we do not consider that WWU's cost-benefit analysis (CBA) fully demonstrates that the selected investment options deliver sufficient net benefit for existing and future

consumers. Given the expected future decline in gas demand, we think there may be further options that could be explored to reduce investments, particularly those with a long payback period.

Workforce Planning: WWU's Business Plan notes that it will face challenges in obtaining skilled resources during RIIO-2. It sets out a reasonable strategy for developing a modern, diverse, high quality, well-trained workforce fit for the future but this is more a statement of ambition than an action plan. We note that the workforce is competent for today's business which is focused on mains replacement and escapes but is not necessarily ready for a hydrogen future which potentially invests significantly in new assets with high technical content. For example, the number of Chartered Engineers is likely to need to be increased in the future if the hydrogen pathway is taken.

Cyber Resilience: WWU has not yet submitted a cyber security plan but has submitted a Business IT security plan (£6.93m). We will rely on Ofgem's review to determine if this is fit for purpose and does not involve duplication with BAU IT expenditures. We note that WWU has included cyber security as an uncertainty mechanism and that planned Totex expenditure for cyber security may be understated as a result.

13.6.4. Environment

The plan and the EAP have developed over the three iterations of WWU's Plan, and the final version shows good intention to take on board comments from us and from others. The EAP is summarised comprehensively in the main Business Plan. There is some genuine ambition - for example, on biomethane (although, as WWU itself notes, the predicted volumes are very ambitious and possibly unrealistic), adaptation to climate change, greening the supply chain and contaminated land. The increased 2034 ambition for scope 1 and 2 carbon reductions (with stakeholder support) is welcome (although Ofgem may wish to probe further the claimed linkage between funding for the net zero vision and this higher target); the material provided on refuelling stations for gas-powered buses etc. is good. There is an attempt to engage with the biodiversity net gain agenda, although some other companies have been more ambitious. Conversely, the level of ambition on leakage (albeit that work here is having to offset the impact of higher operating pressure), aggregates (particularly target for virgin aggregate) and construction waste is below average.

The commitment to exploring (including through innovation initiatives) additional measures to address shrinkage, including alternatives for pre-heating gas and the commitment to paying attention to smaller contributors to leakage such as venting and AGI leakage, is welcome and in contrast to the extreme caution of some other networks about the scope for improvements in this area.

13.7. Net Zero/Whole systems

There is some good material on this subject in WWU's Plan, and continuation and development of existing pilot proposals (for example on hybrid heating). But there is not as yet a full or equal assessment under the full range of scenarios for decarbonising heat. There is passing reference to independent sources such as the CCC but no systematic analysis based on independent external sources.

The net zero strategy relies heavily on the availability of biogas and implicitly assumes transmission is a constraint (hydrogen therefore needs to be consumed close to production) which is at odds with assumptions in other plans and therefore should at least be addressed. And the strategy mostly relies on a regional (self-generated) variant of the FES. There is very little attempt to address the impact of falling gas demand despite our challenge that the likely pattern of peak demand should be further explored.

We welcome the fact that the Plan covers a range of cross sectoral issues: transport, industry, heat – including hybrid heat pumps and non-domestic buildings – and flexible electricity generation. There is evidence that the Company has done some cross vector modelling and the Plan recognises the benefits of smart systems and flexibility to the whole system. We particularly welcome the focus on supporting development of LAEPs, WWU's development of a high-resolution whole system model and the whole system charter with scope for continuing review by the CEG.

13.8. Digitalisation plans

In October we commented that the WWU plan provides little information on plans to exploit digitalisation. We looked forward to this information being provided in December. We felt that WWU should develop plans to use smart meter data to improve network planning and possibly identify capacity and also opportunities to reduce gas pressures (and leakage) and reduce booking of NTS offtake capacity.

WWU's December plan is still quite a generic digitalisation strategy, with limited detail on key focus areas but some good information on past track record with respect to deliverability (e.g. mapping system, connection requests). It appears WWU is already, ahead of RIIO-2, moving into the cloud (but the Plan lacks a description of how the Company proposes to transition from current to future states). There was limited detail about where it stands in relation to 2020 delivery initiatives ahead of RIIO-2.

We also have some reservations about WWU's ability to collaborate and operate as a utility platform. The sharing of its pathfinder model is positive but is the main evidence of collaboration attempts and still seems to be relatively early in the stakeholder discovery journey.

13.9. Managing Uncertainty

Ofgem's requirements for uncertainty mechanism submissions require companies to set out each risk with its materiality, frequency, trigger events, and probability and to explain where the risks lie, justifying the proposed balance of risk between company and consumer.

In our October feedback to WWU we noted that its plan set out a wide range of undefined uncertainty mechanisms, including reopeners for Repex, Capex and for policy changes e.g. heat policy, HSE, cyber, legislation. We asked for more information on the potential risks and costs associated with these uncertainty mechanisms and justification that are additional to those proposed in Ofgem's Business Plan Guidance.

The uncertainty mechanisms in WWU's December Plan are set out and justified in Chapter 12. They are listed in the following table, highlighting where they differ from

Ofgem's proposals. We are keen to ensure that risks are managed by the most appropriate party to manage them, and our views are:

- Streetworks – we think a reopener is appropriate but only for major policy changes.
- Smart metering – we think this should be within the normal business risks faced by the company.
- Cyber and physical security – we agree this should be a reopener, if needed, on a use it or lose it basis. However, we are concerned that WWU has not included cyber security expenditure in its baseline plan and may be reliant on this mechanism to recover what should be baseline Totex costs.
- Large connections – we think that connections should be a normal business risk for the Company, but recognise that an uncertainty mechanism may be appropriate above a suitable threshold
- Workforce resilience – we do not think this should give rise to a reopener: the risk should be managed by the Company.
- Digitalisation strategy – we are particularly concerned that this area is not included as an integral part of WWU's baseline Plan as part of its digitalisation strategy.

Other policy and cost risks are included in the following table; we note that these could have a significant upward impact on costs to be funded by consumers. Little evidence is provided to justify these risks and proposals; WWU appears keen to limit its risk exposure and pass risk to consumers.

2. Summary table – uncertainties

Uncertainties summary table				
Section	Name of uncertainty mechanism	GD1	Ofgem GD2 proposal	Our proposal
	Ofgem licence fee	Pass-through	Pass-through	Pass-through
	Business rates	Pass-through	Pass-through	Pass-through
	Miscellaneous pass-through	Pass-through	Pass-through	Pass-through
	Third party damage and water ingress	Pass-through	Pass-through	Pass-through
	Cost related to gas theft	Pass-through	Pass-through	Pass-through
	Review of agency (Xoserve) costs (also in GT2)	Re-opener	Pass-through	Pass-through
	Review of the non-gas Fuel Poor Network Extension Scheme (FPNES)	Ex-ante allowance, incentive & re-opener for scheme review	Re-opener	Re-opener
a	Specified street works	Re-opener	GDNs to propose mechanism otherwise baseline allowance	Baseline allowance and/or re-opener
b	Smart meter roll-out costs	Baseline allowance and/or re-opener	GDNs to propose mechanism otherwise baseline allowance	Baseline allowance and/or re-opener
c	Net zero review mechanism	N/A	GDNS to propose mechanism	Net zero funding review mechanism
	Repex – Tier 2A iron mains	Volume driver	Volume driver	Volume driver
	Repex – HSE policy changes (including stub ends)	N/A	Re-opener	Re-opener including stub ends
	Real Price Effects	Ex-ante allowance	Indexation	Indexation
	Pensions (established deficit, pension scheme administration and Pension Protection Fund levy)	Re-opener	Re-opener	Re-opener
	Pension deficit charge adjustment	Pass-through	Pass-through	Pass-through
	Enhanced physical site security	Re-opener	Baseline allowance and/or re-opener	Baseline allowance and/or re-opener
d	Changes to charging boundary	Re-opener	N/A	Re-opener
	Whole systems	N/A	Re-opener	Re-opener
	Heat policy	N/A	Re-opener	Re-opener
e	Cyber resilience	N/A	'Use it or lose it' allowance and/or re-opener	Baseline allowance and/or re-opener
f	Large load connection costs	Re-opener	N/A	Re-opener
g	Loss of development land claims	N/A for GD; Re-opener for GT	N/A	Baseline allowance and/or re-opener
h	Changes to DCC funding arrangements	N/A	N/A	Re-opener
i	Digitalisation strategy	N/A	GDNs to propose mechanism	Re-opener subject to further stakeholder feedback
j	Workforce resilience	N/A	N/A	Re-opener to reflect changes in approach to managing working hours from WTD to fatigue management
k	Materiality thresholds	1% of base allowed after sharing factor applied	1% of base allowed after sharing factor applied	Ensure risk/reward balance is maintained as per GD1
l	Aggregate cap on network re-openers	Aggregate cap	N/A	Aggregate cap as per GD1
	Inflation indexation of RAV and allowed return	RPI	CPIH	Click **Chapter 22: Financeability** for further information
	Cost of debt indexation	Indexation iBoxx 10 years	Indexation iBoxx 11 to 15 years	Click **Appendix 22A**
	Cost of equity indexation	N/A	Indexation	Click **Appendix 22B**
	Tax	Base allowance with trigger and claw back mechanism	Three options being considered	

WWU considers that a labour RPE for GD2 of 0.6% pa is appropriate based on its forecast cost structure. However, the supporting analysis by Oxera appears to be based on expected cost pressures resulting from the lack of trained staff. We think most of them (e.g. employee costs and procurement), are within the control of the

Company and are already subject to interventions to address rising cost pressures. They should not, therefore, in our view be included within any RPE indexation arrangement.

Overall, we think that WWU has provided a set of uncertainty mechanisms which include what we would consider to be normal business risks and passed these risks to consumers. We expect Ofgem to validate and assess these proposals, taking account of potential bias to the Company's benefit. Where WWU's proposals are taken forward, we expect the benefits to the Company of risk mitigation to feed into an overall calibration of risk/reward within the price control settlement.

13.10. Efficiency – innovation and competition

Innovation: in our October feedback we noted that an innovation strategy, incorporating a number of potential projects, was outlined. We requested clarification as to whether the Company was referring to BAU innovation out of Totex or whether it proposes to use NIA. We said the Plan did not clearly explain how innovation was expected to deliver benefits to consumers in GD-2 and beyond. WWU's December Plan sets out its intention to develop innovations in RIIO-2 with increased collaboration with stakeholders.

The Company says it is making a clear distinction between BAU innovation and NIA innovation, and is self-funding lower risk projects that deliver short term financial efficiencies as BAU. No costs are provided to support this funding commitment.

The Company will seek NIA funding for longer term projects and £13.3m of investment is proposed. It is also seeking an additional £12m of funding for third party innovators for the selected themes and £1.3m to fund delivery costs. WWU proposes to align its innovation projects with the key customer themes, namely:

- Meeting the needs of customers and network users (£0.6m to £1.4m)
- Delivering an environmentally sustainable network (£5m to £15m)
- Maintaining a safe and resilient network (£0.5m to £1.5m).

Overall, while these initiatives are welcome, we think that WWU could have been more ambitious in using innovation funding with respect to these output themes. We also consider that all GDNs, including WWU, should put more focus on progressing previous innovation projects (e.g. plastic transmission pipelines).

Competition: the Business Plan does not identify any projects that are suitable for early or late competition. A description of WWU's approach to native procurement with the benefits that have been delivered by it is provided. WWU has also provided details of example contracts that are currently open for competition.

WWU is the lowest cost biomethane operator, having adopted a lean Grid Entry Unit model; this is a good achievement. The biomethane industry has made the case since 2014 for compression projects to create capacity for injection and this is an area that Ofgem should explore for competitive provision to increase innovation and reduce costs. We note the WWU/Cadent proposal on compression to create capacity but are not convinced this needs to be treated as innovation as it is technically straightforward and widely used in the EU. We believe this proposal should be treated under implementation rather than as a pilot.

We think that WWU could have been more proactive and identified projects suitable for competition that fall below the Ofgem criteria. With clean gas only anticipated in new houses from 2025, it is important that WWU seeks to enable greater competition in connections, not least to ensure that, in the light of the potential introduction of hydrogen, the competency provided by the 165 companies approved to carry out gas connections does not leave the gas industry.

Efficiency/productivity: WWU has included an efficiency challenge of a 0.5% annual compounding Totex reduction. This is claimed to produce a cumulative saving of £18m over RIIO-2. WWU says that it plans to achieve this through BAU innovation projects and workforce productivity. Given the £421m of efficiency savings made during RIIO-1, we think a more ambitious target could have been set for RIIO-2.

13.11. Costs

13.11.1. Scenarios and forecasting

The WWU Plan states that it has been prepared on a 'no regrets' basis against FES scenarios and includes a net zero-ready vision. We understand that the baseline WWU plan in based on the ENA common view, with funding above this level proposed in their Net Zero uncertainty mechanism.

WWU has developed an alternative Net Zero scenario which would require an additional £151m to be spent in RIIO-2 and has proposed this as an additional uncertainty mechanism. However, it is not clear how much of the WWU LTS can be used in the 100% hydrogen model.

13.11.2. Costs

Ofgem's Business Plan Guidance requires companies to justify costs, including cost drivers, consideration of options, and cost profiling. They should also describe how efficiency and innovation will be used to reduce costs and demonstrate how expenditure forecasts map onto relevant ODIs and PCDs.

In our feedback to WWU on its July and October Plans, we expressed our concern that its cost forecasts were higher than necessary. We noted that the WWU Plan proposed ongoing efficiencies and fed back that efficiency gains are only targeted at 0.5% p.a. which appeared unambitious.

In October we noted that the Company's Totex forecast was unchanged from July. We asked for further evidence to justify expenditure plans and unit cost forecasts. In relation to Repex, we asked WWU to provide a clear profile for mandatory and non-mandatory volumes, and associated unit costs, setting out the key changes and reasons for change between RIIO-1 and RIIO-2, including the efficiency gains it had realised and planned.

Additionally, in October, we undertook a deep dive session with WWU, exploring its approach to non-mandatory Repex, intervention techniques, and how its investment and maintenance approach might take advantage of reducing gas demand.

13.11.3. Costs - the WWU December Plan

The WWU Plan proposes expenditure of £1182m in GD-2 which is slightly lower than the £1220m proposed in its July Plan.

We have used the cost categories reported to Ofgem to assess WWU's Plan. While WWU's Plan document includes helpful quantitative breakdowns of changes from GD-1, the justification for these changes is often limited.

We have compared the company's RIIO GD-1 average (six-year actual plus two year forecast) expenditure figures with its RIIO GD-2 five year forecast equivalents in Table 1 below. The table also shows the percentage of Totex that each cost category represents. (We have used this approach to compare all GDN expenditure forecasts for RIIO-2).

For changes between RIIO-1 and RIIO-2, the RAG ratings highlight the range of highest increases (red) to highest reductions (green). The table also shows the percentage of total Totex for each expenditure line, ranging from the lowest percentages being shown as green and the highest as red.

Table 1. RIIO-1 to RIIO-2 WWU Cost Comparison

WWU	GD-1 Average	GD-2 Average	GD-2 Total	% Change	% of totex
Direct Opex					
Work Management	22	22	110	0%	9%
Emergency	10	13	64	32%	5%
Repair	9	11	53	15%	4%
Maintenance	17	17	85	-1%	7%
Statutory independent undertakings (SIU)	-	-	-		
Other Direct Activities	9	3	16	-65%	1%
TOTAL DIRECT OPEX	68	66	329	-3%	28%
	-	-	-		
Indirect Opex	-	-	-		
Business Support	21	27	135	27%	11%
Training & Apprentices	3	4	21	26%	2%
TOTAL INDIRECT OPEX	25	31	156	27%	13%
	-	-	-		
Capex	-	-	-		
LTS, storage and entry	9	15	74	61%	6%
Connections	12	12	62	1%	5%
Reinforcement (<7barg)	4	5	23	2%	2%
Governors	2	3	14	35%	1%
Other Capex	18	10	50	-45%	4%
Transport & Plant	7	7	34	0%	3%
TOTAL CAPEX	53	51	256	-3%	22%
	-	-	-		
Repex	-	-	-		
Tier-1	59	62	312	5%	26%
Tier-2A	1	0	1	-86%	0%
Tier-2B	5	9	46	94%	4%
Tier-3	0	1	6		
Other Policy & Condition (inc. MDPI)	5	5	26	6%	2%
Multiple Occupancy Buildings (MOBs)	2	2	8	-13%	1%
Services Not Associated with Mains Replacement	8	9	43	11%	4%
TOTAL REPEX	80	88	442	10%	37%
	-	-	-		
TOTEX	225	236	1,182	5%	100%

13.11.4. Costs – our review

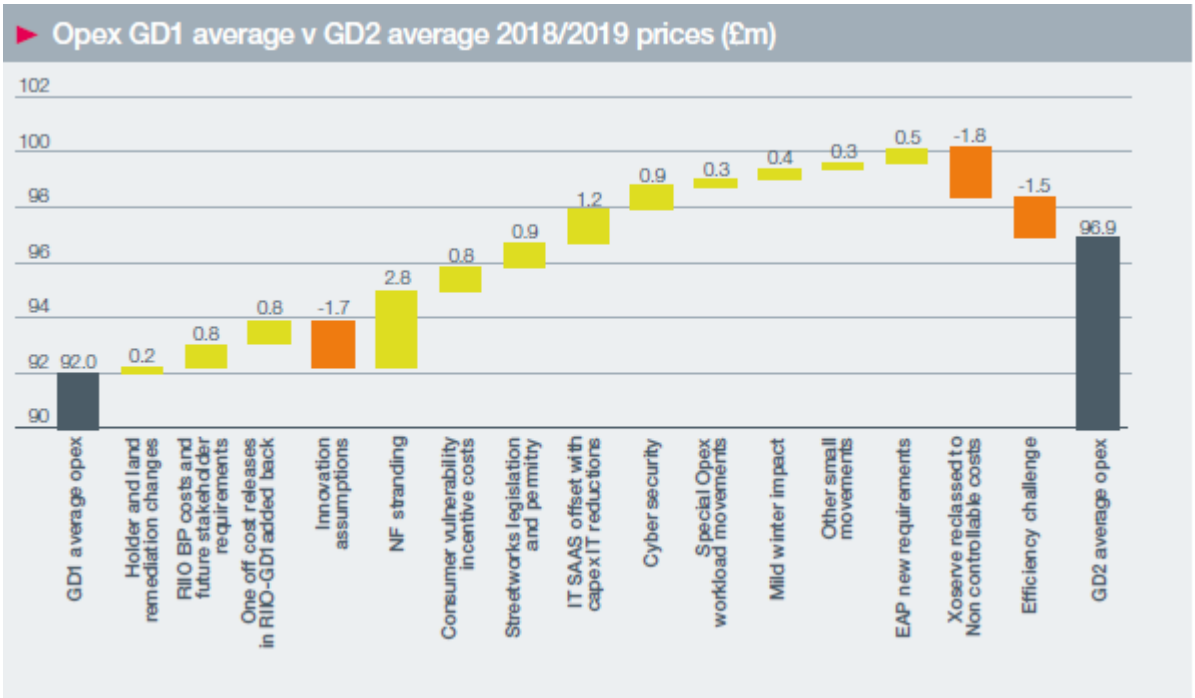
We would make the following observations from this table:

- Average Totex increases by 5% in RIIO-2 over the RIIO-1 level
- Direct Opex shows a small decrease but emergency costs show a 32% increase
- Indirect Opex increases due to a 27% increase in business support costs
- Capex - LTS, storage and entry increase by 61% and governors show a 35% increase
- Repex – Tier 1 shows a 5% increase and Tier 2B shows a 94% increase.

We have then examined some cost areas in more detail and set out our key concerns below:

Opex: the breakdown of the changes in WWU's of plan between GD-1 and 2 are shown below. They probably lie behind the proposed increases in business support costs but we are concerned that the increases are not fully justified.

We note that emergency Opex has increased due to the loss of metering contracts. We don't think that consumers should be bearing an additional cost relating to the loss of unregulated work.



- LTS expenditure increases of c£4.6m are defined as being driven by a specific project of 13km of planned replacement pipeline in GD2. Given the scale of investment, we would ask that the Ofgem team assesses the need case for this and ensures that the lowest cost option is being selected (including part plastic). We are concerned that this project has been delayed from RIIO-1.
- Governors – we do not think the engineering justification for governors explains why increased levels of expenditure over RIIO-1 (either costs or volumes) are required.
- Repex – Tier 2B replacement has increased. We would question whether investment at this level is appropriate at this time given the potential future for gas demand.
- Non-mandatory Repex - In the light of the anticipated reduction in the demand for gas, we suggest that WWU should explore opportunities to extend lives of assets where payback is less than, say, 10 years.
- IT expenditure – we note that total WWU IT expenditure (from business plan data submissions) totals £76m across RIIO-2.
- Mandatory Repex - This accounts for a significant amount of expenditure through to 2032. We would like WWU, together with other GDNs, to work with Ofgem and the HSE to explore whether reductions can safely be made to the mandatory Repex programme during RIIO-2 and beyond. This would take into account the experience from 2002 to date and the statistics on the number of escapes and incidents that have harmed members of the public.

- We understand expenditure is proposed to upgrade gas pre-heating at a number of sites. At present such gas consumed (Own Use Gas) is a pass through cost and hence the use of heat pumps for gas pre-heating (which is a well suited technology given high temperatures are not required) is not economic. We think Ofgem should review the incentives in this area to ensure that gas is metered and there are proper drivers to implement the most appropriate option and not just gas. This should be aligned with shrinkage incentives.

According to Ofgem's most recent published GDN cost benchmarking report, WWU lies behind NGN as a frontier performer. We think there is scope for Ofgem to seek reductions in WWU's Totex forecast.

13.11.5. Our summary cost assessment

In order to evaluate the WWU plan, we have sought to examine the justifications for change from historical costs and volumes, considering upward and downward cost and volume drivers and efficiency improvements. For selected areas of expenditure, we have considered WWU's justifications against the following:

- Is it needed? - The need case for the volumes of intervention, taking account of evidence such as actual asset condition, or customer requirements. While NARMS and monetised risk justifications are expected, we are also looking for corroboration from actual asset condition assessments.

  On Repex, we have not reviewed engineering justifications in detail but they appear to provide a reasonable justification for the volumes of expenditure in the plan. We remain concerned that options for deferring expenditure have not been fully considered.

  On Capex, we believe that there may be options for deferring expenditure due to lower gas demand (new housing etc.) and this should be reviewed as a sensitivity.

  On Opex, we note that emergency costs have increased significantly since RIIO-1; we understand this due to the loss of unregulated metering work. We don't think that consumers should bear these additional costs.

- What intervention? - The type of intervention showing that options have been considered and that there is an appropriate balance between risk and value for money e.g. has lower cost refurbishment been fully considered?

  To assess this, we have looked at an example of open cut versus insertion intervention techniques and are satisfied that WWU is seeking to deploy the least cost option wherever possible. However, we have not been able to undertake benchmarking across GDNs and would expect Ofgem to examine this area further.

- Is it efficient? – are unit costs efficient? Have efficiencies and innovation benefits been built in? Are risk margins being added to project costs?

  We have concerns that unit costs may be higher than necessary. We anticipate that Ofgem benchmarking will help to give us assurance in this area.

- Was it previously claimed under RIIO-1? – Is this an activity that appears to have been deferred from RIIO-1 and that customers have already paid for?

  WWU has significantly underspent its allowance in RIIO-1 and is seeking an increased level of Totex in RIIO-2. We have concerns that Tier 1 and 2B Repex will increase for RIIO-2 due to deferrals from RIIO-1. This is a very important area and we expect Ofgem will review the details to ensure that RIIO-1 has not focused on the easier work and pushed more expensive into RIIO-2.

The WWU plan shows a 5% increase in Totex from RIIO-1 despite a reducing demand for gas. Increases in expenditure in Repex and business support areas should be investigated further by Ofgem.

With no gas anticipated in new houses from 2025 and local authorities setting decarbonisation targets for 2030 it can reasonably be expected that the Capex associated with new connections and reinforcement will fall significantly. There are other benefits from falling gas demand in terms of lower replacement, leakage and reinforcement costs and Ofgem should review these benefits to ensure they flow to customers. Increases in expenditure in policy Repex areas should be investigated further by Ofgem, in particular the benefits in terms of workforce availability from the ending of gas connections in new homes.

Furthermore, we think non-mandatory replacement schemes with long payback periods should be reconsidered and Ofgem should review this to ensure a consistent methodology is applied across the country. Ofgem should also incentivise lower cost options where these can be accepted by the HSE (e.g. not replacing stub ends).

Overall we have identified areas that we think Ofgem should review in order to ensure that the costs are efficient.

13.12. Engineering Justifications and CBA

In our October feedback we noted that some information had been provided since the July Plan. However, our view was that weak evidence of justifications had been provided to support expenditure plans, especially the approach to probability of failure, iron mains replacement, and explanation of unit costs. We asked for full justifications to be available in the December plan.

The Engineering Justifications submitted with the December Plan appear reasonable. We would ask that Ofgem review non mandatory replacement, the implications of Net Zero on gas demand and AGI/PRS/Heating.

While greater justification has been provided, we remain concerned that the justifications are of a generic nature and that the results may be subject to significant uncertainty and potential overstatement of risk. Given the limited time we have had to examine these justifications; we will rely on the further examination by the Ofgem teams. We would like to see evidence that engineering justifications are based on specific projects and use evidence of historic actual asset condition to corroborate asset health models.

The CBAs do not fully examine options for future energy scenarios with reduced gas usage and we are concerned that investment projects with long paybacks are being

supported when deferment may be a better option for customers. Again, we would ask Ofgem to examine this area further.

13.13. Finance

We have evaluated the financeability section of WWU's Plan against adherence to Ofgem's financial plan requirements, whether and how it is financeable, how far relevant measures to aid financeability have been considered at the lowest cost to the consumer and what evidence there is of effective engagement both with appropriately qualified consumers and with our prior feedback in relation to financeability. Note that our analysis of the Final Plan does not include an analysis of compliance with Ofgem's WAs.

We considered WWU's July Plan to be non-compliant with Ofgem's Business Plan Guidance in a number of respects: it did not include a detailed financeability assessment based on Ofgem's WAs for Cost of Equity and Debt and the analysis used rates for both well in excess of the Ofgem's WAs for them. Sensitivity analysis also fell short of Ofgem's requirements. There was no detailed consideration as to how changes to depreciation and capitalisation rates could improve financeability or of consumer engagement in relation to trade-offs in individual elements relating to financeability. Rates were unhelpfully quoted on an RPI-stripped basis and there was insufficient distinction made between the company's 'Notional Efficient Operator' concept and the Notional and Actual Company cases required by Ofgem.

The October Plan was improved and showed some evidence of engagement with our commentary on the July Plan. There was financeability analysis for both the Notional and the Actual Ofgem Company though the preferred non-compliant WWU business plan was confusingly presented first. The analysis based on Ofgem's WAs was, unhelpfully, not presented in conjunction with associated credit ratings. The Notional, though not the Actual, Company was said to be financeable at the BBB level on the basis of Ofgem's WAs, albeit with limited head room. Despite our August request for a full presentation in October and our clear statement at that time that we considered the Cost of Capital allowances used in the case on which WWU was insisting (equity 6.78% and debt 5.35% both CPIH stripped) were very much in excess of those needed to make the Notional Company financeable, we were disappointed to note that, even though the Company insisted that its Plan was not financeable on an actual basis, it had decided to defer exploration of mitigation measures, such as a shortening of the depreciation period, until December. There was no detailed analysis of mitigation measures other than an increase in the Cost of Capital allowances. There was evidence of some engagement with consumers but little indication of detailed interaction in relation to specific financing issues and the trade-offs implied. In particular, there was no evidence of consumer support for the concept that the very high cost of capital proposed was the only possible route to improved financeability.

The Final Plan showed some evidence of having noted our commentary. As suggested by us, it makes a clearer distinction between the Ofgem Notional and Actual Companies on the one hand and the WWU business plan on the other: they are dealt with in separate Annexes. The Plan contains compliant (i.e. based on Ofgem's WAs) analysis, on both a notional and an actual basis, but there are multiple assertions that the Ofgem cost of capital proposals are not acceptable and

that the WWU business plan is therefore the basis on which the Company proposes to proceed.

WWU confirms that the Notional Company is financeable on the basis of Ofgem's WAs with a rating of BBB+ declining to BBB over the RIIO-2 period, against a target rating of BBB+. It has not complied with our request for detailed consumer engagement if ratings higher than BBB are to be targeted.

WWU's position on the Actual Company is also unclear: on the one hand it states that the Actual Company (by clear implication using Ofgem's WAs) would be compliant with its licence requirement (i.e. at least BBB- rated) but, on the other hand, it asserts that the Actual Company is not financeable without higher Cost of Capital allowances. (We take this to be in the context of a target rating equivalent to WWU's current rating of A- for Class A debt and BBB for Class B). Sensitivity analysis, based on zero cash returns to shareholders for the duration of GD2 by way of mitigation, is provided in support of the statements about the lack of financeability. In our view, the analysis indicates that, as the Actual Company would suffer only a one notch reduction in rating (BBB+ for Class A debt and BBB to BBB- for Class B), the Actual Plan would be financeable, albeit probably with negative outlook from the rating agencies and with limited headroom. We were disappointed to note that the Company insists that is not so.

There is very little evidence that WWU has given detailed consideration to mitigating actions which are at the lowest cost to the consumer. Shortening the depreciation period and reducing the capitalisation rate are both specifically rejected as mitigation measures on the basis that the switch to CPIH gives rise to an acceleration of revenues which WWU does not consider warranted and that further acceleration would be unacceptable. It gives three reasons for this: intergenerational fairness, the fact that asset lives should not be shortened (despite the acknowledged risks for the gas distribution sector) and the fact that, in its view, depreciation would be excluded from core interest cover metrics. For similar reasons of intergenerational fairness and the need to avoid a shortening the economic lives of gas assets, it does not propose to alter capitalisation rates. There is no analysis of the impact on credit ratings of either measure nor of consumer engagement in that regard.

The Plan is explicit in rejecting Ofgem's Cost of Capital WAs. It proposes to proceed on the basis of the WWU business plan which is based on a Cost of Equity allowance of 6.1% and a Cost of Debt allowance of 5.25%, with leverage at 60%. We consider this to be very considerably higher than required to ensure financeability of the Notional or the Actual Company.

It is clear that WWU has high cost embedded debt and that, although some refinancing in 2018 mitigated that cost, it has not removed it. It is also clear that, in order to achieve Actual Company financeability on the basis of Ofgem's Cost of Capital WAs, even on the basis of zero returns to shareholders and the targeting of ratios nearer to the minimum required to achieve an investment grade rating, headroom will be limited. However, we note that WWU's analysis is based on a high (around 70%) gearing assumption and the retention of very significant swap losses. We also note that WWU has given consideration as to the most appropriate financing options and that this work has been supported by Rothschilds; WWU has rejected the potential solutions which Rothschilds describes as presenting risk to shareholders. Although there is evidence of analytical work by both WWU and

Rothschilds, we consider WWU could have further explored the options for financing the Actual Company at the lowest cost to the consumer, and that the exploration of every available option is particularly important in the light of the fact that it must have been clear to the Company that, when it established its financing arrangements on terms which were considerably less favourable to it than then current or anticipated regulatory assumptions, it was taking on considerable risk.

We do not support the degree of responsibility which WWU places with Ofgem for the financeability of the Actual Company and are clear that the problems in relation to the financeability of the Actual Company are in large measure for shareholders to resolve and neither do we support WWU's argument that Cost of Capital allowances should be set on a company by company basis. We note that, although WWU refers in its plan to Ofgem's requirement that alternative cost of capital proposals should be appropriately separated, it has chosen to present references to its 'WWU business plan' in immediate proximity to cases based on Ofgem WAs in the main body of its Plan and, even more confusingly, has summarised a case under the heading of 'Ofgem Actual Company' which uses its own assumption for the cost of debt. Almost all companies presented a case for higher Cost of Capital allowances, but the extent of WWU's rejection of Ofgem's WAs and the magnitude of the additional revenues requested, together with its emphasis on the extent of Ofgem's responsibility for ensuring Actual Company financeability are, in our view, unhelpful.

The Final Plan does show some evidence of engagement with consumers on financing issues but ignores our advice that it should engage with consumers on specific issues relating to financeability on the basis that the subject is too complex for them.

Overall, the WWU Plan shows that the Notional and the Actual Company have both been modelled as requested by Ofgem. The Notional Company is clearly stated to be financeable over the RIIO-2 period but we consider WWU's exploration of the financeability of the Actual Company falls very well short of what consumers could reasonably expect.

13.14. Consumer Value Proposition

WWU's December Plan contains a CVP comprising ten elements. This is a refinement of the list in the October Plan and reflects engagement with the CEG.

WWU has identified proposals in relation to supporting vulnerable customers, service standards and environmental actions, all of which, we have suggested in our overview comments, need to be looked at as a whole and benchmarked by Ofgem in order to establish whether one of the companies is offering additional value across its offering rather than picking out individual elements. From our analysis we are not satisfied that there are elements of the WWU CVP proposals in this area which stand out as better than what is now BAU or as best in class. We welcome initiatives to support volunteering in the community but take the view, that this should be seen as part of the expected corporate social responsibility activity of a company which wishes to have standing in the community.

We note that there are proposals for enhanced payments for failure to meet GSOP or for customers left without gas for more than 12 hours, both of which seem to have customer support. However, as in other areas, we are not convinced, if these are

intended to be shareholder funded, that a specific CVP reward will be compatible with the spirit of the initiatives.

Annex 1 Energy Networks Association future scenarios working group

Ofgem set out in its Business Plan guidance document that it expected networks across transmission, distribution, gas, and electricity to agree a set of common factors and assumptions to develop their core view of the future. The network companies subsequently established a working group through the Energy Network Association (ENA) to consider common future scenarios called the ENA future scenarios working group. Ofgem requested us to consider the output produced by this working group and provide views on it.

We shared our views with Ofgem in May 2019 in a written report, ahead of Ofgem's final decision on sector methodologies for RIIO-2. This section provides a summary of the report to Ofgem for transparency and completeness.

Background

In December 2018, following an introductory presentation from the ENA future scenarios working group, the Group sent a letter to each company setting out the group's requirements for 'common factors and assumptions to develop their core view of the future' to be provided between December 2018 and the end of March 2019. Follow up letters were sent to the companies in January and February 2019 to maintain the focus on the delivery of these requirements. The Group, in summary, asked for the following information:

a) **Key drivers** (upward and downward) behind the plans, including how they would impact aggregate expenditures and energy demand overall. Supporting evidence of the key drivers together with the independent view of the ESO on the robustness of the scenarios.

b) Evidence of **differing views** between companies to help the Group to understand the different perspectives and implications.

c) Consideration of a **whole system approach**, including consideration of trends outside the Transmission & Distribution networks. This should include synergies across vectors, changes to customer behaviour, exploiting innovation including alternatives to network growth. Specific case studies were also requested to highlight trade-offs.

d) **Regional consolidation** – ensuring that regional differences were consistent with national or cross sector assumptions.

e) **Scenarios** – identifying the range of scenarios used in developing common assumptions including trends to 2050. Key points that were highlighted were to:

- Demonstrate that the scenarios are consistent and not a collection of assumptions.
- Provide background details on specific initiatives or assumptions that are included.
- Explain the assumptions on subsidies, including timelines.

The ESO undertook a review of the ENA future scenarios working group output. The views of the ESO were also shared with the Group. The ESO noted that "Care

should be taken not to consistently pick values from the top or bottom end of the ranges as this could lead to a result outside of the Future Energy Scenarios range, where the scenarios are developed on a mix of low, medium and high drivers, that combine in a holistic manner to meet security of supply standards."

Assessment of the Group

We considered that network companies had cooperated and collaborated effectively through the ENA future scenarios working group to provide information on time to the Group. The identification of key drivers, assumption ranges and regional distributional impacts has been helpful.

However, the values of assumptions that were presented had broad ranges, and self-consistent scenarios were not provided. Limited evidence was provided to substantiate the assumptions and reconciliation of data was sometimes unclear. There was little exploration of downward cost drivers or of other sources of scenario analysis.

Recommendation for Ofgem

Given the companies have not produced a consistent set of scenarios, we were unable to recommend a set of scenarios for Ofgem to provide to the companies as the basis for their Business Plans. However, we also consider that it would not have been useful for us to recommend a single view of the future for companies to follow because this might well have created a false sense of certainty. Instead, we suggest that Ofgem takes account of this lack of consistent scenario information in informing its policy approach to RIIO-2.

We think that Ofgem should consider applying a low baseline scenario, supported by uncertainty mechanisms where appropriate. Any company variations from this scenario should be carefully scrutinised before acceptance. Finally, we encourage Ofgem to learn lessons from this process for RIIO ED-2 and for RIIO-3.

Annex 2: List of Issues for further analysis/ Open Hearings

Cross-cutting issues

1. Stakeholder engagement maturity

   - We are concerned that the approach of many network companies to stakeholder and consumer engagement remains intermittent and immature. In that context, Ofgem should consider the extent to which it is satisfied that plans have genuinely been built from the outside in, and that outputs in particular are based on a solid understanding of customer and consumer needs and wants.

2. Social return on investment tools

   - Ofgem should test these methods further to ensure that these tools are robust and that the ways they have been applied are comparable and proportionate (in quantifying CVP proposals, in particular)

3. Fuel Poor Network Extension Scheme

   - Are the low levels proposed by GDNs for RIIO-2 acceptable given limitations on whole-house treatments?

4. Average restoration time for unplanned interruptions:

   - Are the targets proposed by all GDNs sufficiently stretching, even if these are intended to be only 'minimum' standards?

5. Net zero proposals

   - To what extent should companies take into account possible future redundancy of assets in forming Capex decisions within this RIIO-2 cycle?

6. CVP proposals

   - Ofgem may wish to consider whether reward for shareholder-funded initiatives is appropriate and, if so, whether stakeholder engagement for such proposals risks being invalidated (as they would, in effect, become partly consumer-funded)

   - Ofgem should consider whether individual proposals which deliver value, but which sit within an overall offering which is not best in class, should qualify for reward

   - Our sense is that companies have done limited engagement on their CVPs. Ofgem may wish to use hearings to seek stakeholder views on what should be regarded as business as usual in areas such as: provision for consumers in vulnerable circumstances; managing environmental impact; and social responsibility action.

Company Specific Questions

NGET

1. **Non-load related expenditure:** NGET expect to increase their non-load related expenditure by 42% compared to RIIO-1. Volumes and unit costs have increased without good engineering justification and the numbers presented in the plan are difficult to navigate. Expenditure appears to have been deferred from RIIO-1 resulting in a Totex underspend of 20% and a RORE of 10.5%. We are also concerned that the output measures that NGET proposes for NLRE are not sufficiently robust. The reasons for these large NLRE increases should be explored further, ensuring that customers are not paying twice for the same investments.
2. **Load related expenditure:** This has been forecast using expected generation scenarios supported by evidence from the ESO NOA process. We are concerned that the evidence provided by NGET to justify this expenditure is not sufficiently clear nor robust and does not take account of the opportunity for non-network or whole system solutions. While uncertainty mechanisms have been designed to cater for variability in generation and reinforcement needs, we are concerned that they may unduly benefit the company for any change. The justification for these load related expenditure assumptions and associated uncertainty mechanisms should be explored further.
3. **Uncertainty mechanisms**: NGET have identified uncertainty mechanisms in accordance with Ofgem's sector methodology together with a number of bespoke factors. It is unclear what costs have already been included in the Totex baseline for these and the element of risk that is being assumed by the company and consumers. Bespoke risks include risks that we would expect to be included as business as usual risks for the company. We are concerned consumers are assuming risks which are best managed by the company and think many of NGET's uncertainty mechanisms need to be explored further.
4. **Efficiency:** NGET has claimed very significant Totex efficiency savings in RIIO-1 yet forecast limited savings in RIIO-2. In particular, NGET's IT and related costs show a significant increase since RIIO-1. While some of this increase is for cyber security costs, we are concerned that BAU IT cost increases are unclear and unjustified. This should be explored further.
5. **Competition**: across NGET's entire expenditure programme, they have not identified any projects (outside the NOA process) that are suitable for early or late competition. We suggest this is explored further to examine the asset categories that could potentially be opened to such competition e.g. sole use connections
6. **Acceptability testing**: consumers qualified their support for NGET's plan and its associated costs by saying it would not be acceptable if all parts of their bills went up by the same amount. Ofgem should explore the implications of this qualified consumer support for the costs in NGET's plan.

7. **Whole-system thinking**: Ofgem should explore NGET's view of whole system thinking in terms of linking electricity and gas. What role should there be for NGET in this?

8. **Financing**: NGET should be asked why, since its analysis shows that it could achieve a BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 6.5% Cost of Equity allowance and a Cost of Debt allowance equivalent to about 2.4% (plus substantial issuance etc. charges). It should explain why these higher Cost of Capital allowances are good value for the consumer rather than simply an attempt to improve its equity return. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored lower target ratings and higher gearing, possibly in combination with changes to depreciation and capitalization rates as potential aids to financeability?

SPT

1. **Non-load related expenditure:** SPT expect to increase their non-load related expenditure by 15% compared to RIIO-1. While we think SPT makes a reasonable case for the volumes and intervention methods for this expenditure, we are concerned that some elements e.g. unit costs, may be higher than necessary and should be investigated further. We are also concerned to ensure that the output measures for NLRE are sufficiently robust.

2. **Load related expenditure:** This has been forecast using expected generation scenarios and is supported by evidence from the ESO NOA process. We are concerned that the evidence provided by SPT to justify this expenditure is not sufficiently clear nor robust and does not take account of the opportunity for non-network or whole system solutions. While uncertainty mechanisms have been designed to cater for variability in generation and reinforcement needs, we are concerned that they may unduly benefit the company for any change. The justification for these load related expenditure assumptions and associated uncertainty mechanisms should be explored further.

3. **Uncertainty mechanisms**: SPT have identified uncertainty mechanisms as expected by Ofgem's sector methodology. SPT has also included some bespoke risks which we would expect to be included as business as usual risks for the company. We are concerned consumers are assuming risks which are best managed by the company and think some of SPT's uncertainty mechanisms need to be explored further.

4. **Efficiency:** SPT is showing significant increases in network operating costs and business support costs. The evidence for this increase should be explored further, including why these costs are additional to BAU and whether SPT has chosen the most efficient delivery approach.

5. **Competition**: SPT has identified a project for synchronous compensation which they think should be opened up to competition. However, they have not identified other projects on their network (outside the NOA process) that are suitable for early or late competition. We suggest this is explored further to

examine the asset categories that could potentially be opened to such competition e.g. sole use connections.

6. **Vulnerable consumers**: Ofgem should further explore whether SPT's proposal to understand the impact on vulnerable communities of a black start and to support Community energy schemes merits an additional financial incentive. It should also explore SPT's plan to leave wider engagement with individual vulnerable consumers to its distribution arm.

7. **Whole systems**: given SPT's stated commitment to this area, Ofgem should explore when further specific whole system solutions will be forthcoming.

8. **Financing:** SPT should be asked why, since its analysis shows it could achieve an A-/BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 6.5% Cost of Equity allowance. It should explain why this higher Cost of Equity allowance is good value for the consumer rather than simply an attempt to improve its equity return. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored higher levels of gearing, possibly in combination with changes to depreciation and capitalization rates as potential aids to financeability?

SHET

1. **Stakeholder engagement**: given the limited nature of the final acceptability testing carried out on SHET's plan, Ofgem should satisfy itself that it has a sufficiently robust and quantified steer on consumers' and stakeholders' views on whether the overall plan is acceptable and affordable.

2. **Non-load related expenditure:** SHET expect to increase their non-load related expenditure by 256% compared to RIIO-1. Volumes and unit costs have increased without good evidence and the engineering justifications were only submitted in December. We are also concerned that the output measures that SHET proposes for NLRE are not sufficiently robust. The reasons for these large increases and the robustness of the associated outputs should be explored further.

3. **Load related expenditure:** This has been forecast using SHET's own 'Certain View' of expected generation scenarios and quotes evidence of support from the ESO NOA process. We are concerned that the evidence provided by SHET to justify this expenditure is not sufficiently clear nor robust and does not take account of the opportunity for non-network or whole system solutions. While uncertainty mechanisms have been designed to cater for variability in generation and reinforcement needs, we are concerned that they may unduly benefit the company for any change. The justification for these load related expenditure assumptions and associated uncertainty mechanisms should be explored further.

4. **Uncertainty mechanisms**: SHET have identified uncertainty mechanisms in accordance with Ofgem's sector methodology together with several bespoke mechanisms. Bespoke risks include those which we would expect to be included as business as usual risks for the company or should be included in

baseline Totex. We think SHET's uncertainty mechanisms pass undue risk to consumers and need to be explored further.

5. **Efficiency:** SHET is showing significant increases in network operating costs and other support costs without robust justification. The evidence for this increase is unclear and should be explored further, including why these costs are additional to an extensive asset replacement programme.
6. **Competition**: across SHET's entire expenditure programme, they have not identified any projects (outside the NOA process) that are suitable for early or late competition. We suggest this is explored further to examine the asset categories that could potentially be opened to such competition e.g. sole use connections.
7. **Whole System:** Ofgem should explore SHET's process for developing specific whole system options and associated business cases since there is limited information on these in its plan.
8. **Financing:** SHET should be asked why, since its analysis shows that it could probably achieve a BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 6.9% Cost of Equity allowance which is higher than proposed by any of the other GDNs. It should explain why this higher Cost of Equity allowance is good value for the consumer rather than simply an attempt to improve its equity return. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored lower target ratings and higher gearing, possibly in combination with changes to depreciation and capitalization rates as potential aids to financeability, especially in the light of the potential for stranded gas sector assets?

NGGT

1. **Net Zero leadership**: while NGGT has set out some useful thinking with regard to Net Zero, we are concerned that this does not address key issues such as the future industry structure for hydrogen, future policy design, and how international experience may be used. We are concerned that NGGT is taking a reactive stance in its plan to protect its existing business rather than seeking to realise Net Zero benefits. We think NGGT's potential ambition for Net Zero should be explored further.
2. **Non-load related expenditure:** NGGT expects to increase its non-load related expenditure by 39% compared to RIIO-1. We are concerned that costs and volumes to support this expenditure are not sufficiently evidenced and that the output measures used to justify asset health expenditures are not sufficiently robust. The reasons for these asset health expenditure increases should be explored further.
3. **Falling gas demand**: NGGT is planning significant expenditure on its compressor fleet and related assets in an environment of falling gas demand and lower running hours for compressors. We are concerned that the planned expenditure does not take account of this decreased utilisation and look at alternative lower cost intervention options for these assets. Interventions with

long payback times should not be pursued. The options for reducing these costs and reflecting lower gas demand should be explored further.

4. **IT expenditure**: NGGT is planning significant levels of IT expenditure to replace control systems and enhance cyber-security. While we agree with confidentiality for security reasons, we are concerned that normal business IT costs have been included in this area and thereby removed from our scrutiny. We are concerned that these costs are excessive and have not been justified. We think, for example, that lower cost options for intervention on compressor control and communication systems may not have been considered.
5. **Efficiency**: we are concerned that proposed efficiency and innovation savings have not been reflected in the Totex forecasts. We would like to understand these savings and what opportunities have been considered to extend them further.
6. **Uncertainty mechanisms**: Are the proposed UMs, both when considered individually, and as a package, a fair allocation of risk between the company and customers, and is the resulting risk/return reflected in Ofgem's target RORE?
7. **Outputs**: Are the proposed targets and costs for NGGT's outputs sufficiently stretching and do they offer value for money? They were particularly difficult to judge as they are unique to this company and details emerged only in the last draft.
8. **Financing**: NGGT should be asked why, since its analysis shows that it could achieve a BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 6.5% Cost of Equity allowance and a Cost of Debt allowance equivalent to about 2.4% (plus substantial issuance etc. charges). It should explain why these higher Cost of Capital allowances are good value for the consumer rather than simply an attempt to improve its equity return. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored targeting lower ratings and higher gearing, possibly in combination with changes to depreciation and capitalization rates as potential aids to financeability, especially in the light of the potential for stranded gas sector assets?

Cadent

1. **Stakeholder engagement**: Cadent proposes a 'common' financial incentive for companies to undertake stakeholder engagement on whole system issues. Is this merited or should engagement on these critical issues be regarded as part of business as usual?
2. **Net Zero leadership**: while Cadent has set out some useful thinking with regard to Net Zero, we are concerned that this does not address key issues such as the future industry structure for hydrogen, future policy design, and how international experience may be used. We are concerned that Cadent is taking a reactive stance in its plan to protect its existing business rather than seeking to realise Net Zero benefits. We think Cadent's potential ambition for Net Zero should be explored further.

3. **Mandatory mains replacement programme**: given the reducing risk profile for mandatory mains replacement, we would like to understand what steps are planned to undertake a review of the mains replacement programme and seek a reduced expenditure profile. We would also like to clarify what Cadent's assumptions are for the replacement of Tier1 iron stubs and how these have been reflected in the baseline plan and uncertainty mechanisms.
4. **Falling gas demand**: Cadent is planning significant expenditure on non-mandatory Repex and maintenance. Given the forecast decline in gas utilisation, we are concerned that Cadent is undertaking Repex projects with long paybacks that may not be required, and not exploiting the capability to reduce gas pressures to reduce leakage and operating costs.
5. **Uncertainty mechanisms**: Cadent have identified uncertainty mechanisms in accordance with Ofgem's sector methodology together with several bespoke mechanisms. Bespoke risks include those which we would expect to be included as business as usual risks for the company or should be included in baseline Totex. We think Cadent's uncertainty mechanisms pass undue risk to consumers and need to be explored further.
6. **Efficiency**: we are concerned that proposed efficiency and innovation savings are still insufficient to move Cadent to the efficiency frontier. We would like to understand these efficiencies and what opportunities have been considered to extend them further.
7. **Financing**: Cadent should be asked why, since its analysis shows it could achieve a BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 5.6% Cost of Equity allowance and a Cost of Debt allowance equivalent to about 2.4%. It should explain why these higher Cost of Capital allowances are good value for the consumer rather than simply an attempt to improve its equity return. In the light of its current low cost of debt, why does it consider that it needs a Cost of Debt allowance higher than that proposed by Ofgem? Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored higher levels of gearing, possibly in combination with changes to depreciation and capitalisation rates, as potential aids to financeability, especially in the light of the potential for stranded gas sector assets?

NGN

1. **Net Zero leadership**: while NGN has set out some useful thinking with regard to Net Zero, we are concerned that this does not address key issues such as the future industry structure for hydrogen, future policy design, and how international experience may be used. We are concerned that NGN is taking a reactive stance in its plan to protect its existing business rather than seeking to realise Net Zero benefits. We think NGN's potential ambition for Net Zero should be explored further.
2. **Mandatory mains replacement programme**: given the reducing risk profile for mandatory mains replacement, we would like to understand what steps are planned to undertake a review of the mains replacement programme and seek a reduced expenditure profile.

3. **Falling gas demand**: NGN is planning significant expenditure on non-mandatory Repex and maintenance. Given the forecast decline in gas utilisation, we are concerned that NGN is undertaking Repex projects with long paybacks that may not be required, and not exploiting the capability to reduce gas pressures to reduce leakage and operating costs.
4. **Efficiency**: we are concerned that proposed efficiency and innovation savings do not fully reflect the efficiency achievements from RIIO-1. We would like to understand these savings and what opportunities have been considered to extend them further.
5. **Financing**: NGN should be asked why, since its analysis shows that it could achieve a BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 5.0% Cost of Equity allowance and a Cost of Debt allowance equivalent to about 2.4%. It should explain why these higher Cost of Capital allowances are good value for the consumer rather than simply an attempt to improve its equity return, particularly in the light of the fact that it has a locked in cost of debt lower than Ofgem's proposed Cost of Debt allowance. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored higher levels of gearing and changes to depreciation and capitalisation rates as potential aids to financeability, especially in the light of the potential for stranded gas sector assets?

SGN

1. **Net Zero leadership**: while SGN has set out some useful thinking with regard to Net Zero, we are concerned that this does not address key issues such as the future industry structure for hydrogen, future policy design, and how international experience may be used. We are concerned that SGN is taking a reactive stance in its plan to protect its existing business rather than seeking to realise Net Zero benefits. We think SGN's potential ambition for Net Zero should be explored further.
2. **Mandatory mains replacement programme**: given the reducing risk profile for mandatory mains replacement, we would like to understand what steps are planned to undertake a review of the mains replacement programme and seek a reduced expenditure profile. We would also like to clarify what SGN's assumptions are for the replacement of Tier1 iron stubs and how these have been reflected in the baseline plan and uncertainty mechanisms.
3. **Falling gas demand**: SGN is planning significant expenditure on non-mandatory Repex and maintenance. Given the forecast decline in gas utilisation, we are concerned that SGN is undertaking Repex projects with long paybacks that may not be required, and not exploiting the capability to reduce gas pressures to reduce leakage and operating costs.
4. **Uncertainty mechanisms**: SGN have identified uncertainty mechanisms in accordance with Ofgem's sector methodology together with several bespoke mechanisms. Bespoke risks include those which we would expect to be included as business as usual risks for the company or should be included in

baseline Totex. We think SGN's uncertainty mechanisms pass undue risk to consumers and need to be explored further.

5. **Totex increase:** we are concerned that SGN's Totex increase of some £50m pa, primarily due to enhanced outputs is not efficient and includes costs that should be baseline costs. We would like to understand these savings and cost increases further. We are concerned that SGN's cost increases move it further from the efficiency frontier.

6. **Social Value Collaboration:** There is a bespoke financial incentive proposed for 'social value collaboration'. We think this has merit but are the costs, returns and social benefits assumed in SGN's proposal reasonable?

7. **Financing:** SGN should be asked why, since its analysis shows it could achieve a BBB+ rating (at least for its Notional Company) with Ofgem's Cost of Capital WAs, it is insisting on a 6.9% Cost of Equity allowance with 65% gearing and a Cost of Debt allowance equivalent to about 2.5%. It should explain why these higher Cost of Capital allowances are good value for the consumer rather than simply an attempt to improve its equity return. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored higher levels of gearing, possibly in combination with changes to depreciation and capitalization rates, as potential aids to financeability, especially in the light of the potential for stranded gas sector assets? It should also be asked why the projected 70% gearing in its Actual Company benefits consumers and what the impact of that level of gearing is on shareholder returns.

WWU

1. **Net Zero leadership**: while WWU has set out some useful thinking with regard to Net Zero, we are concerned that this does not address key issues such as the future industry structure for hydrogen, future policy design, and how international experience may be used. We are concerned that WWU is taking a reactive stance in its plan to protect its existing business rather than seeking to realise Net Zero benefits. We think WWU's potential ambition for Net Zero should be explored further.

2. **Mandatory mains replacement programme**: given the reducing risk profile for mandatory mains replacement, we would like to understand what steps are planned to undertake a review of the mains replacement programme and seek a reduced expenditure profile. We would also like to clarify what WWU's assumptions are for the replacement of Tier1 iron stubs and how these have been reflected in the baseline plan and uncertainty mechanisms.

3. **Falling gas demand**: WWU is planning significant expenditure on non-mandatory Repex and maintenance. Given the forecast decline in gas utilisation, we are concerned that WWU is undertaking Repex projects with long paybacks that may not be required, and not exploiting the capability to reduce gas pressures to reduce leakage and operating costs.

4. **Uncertainty mechanisms**: WWU have identified uncertainty mechanisms in accordance with Ofgem's sector methodology together with several bespoke

mechanisms. Bespoke risks include those which we would expect to be included as business as usual risks for the company or should be included in baseline Totex. We think WWU's uncertainty mechanisms pass undue risk to consumers and need to be explored further.

5. **Efficiency**: we are concerned that some costs are included in uncertainty mechanisms and not in the plan baseline and so efficiency benefits may be overstated. We think this may move WWU away from the efficiency frontier. We would like to understand these costs and efficiencies further.

6. **Financing:** WWU should be asked why, since its analysis shows it could achieve a BBB+ rating with Ofgem's Cost of Capital WAs, it is insisting on a 6.2% Cost of Equity allowance and a 5.25% Cost of Debt allowance. It should explain why it considers Cost of Capital allowances very much out of line with those which the other GDNs are seeking to be appropriate (particularly against the background that, because of the debt/equity split, an increase in the Cost of Debt allowance has a significantly greater impact on the cost of capital than a higher Cost of Equity allowance) and why it considers these Cost of Capital allowances are good value for the consumer. Why has it rejected the concept of the 0.5% outperformance wedge? In the light of the widespread outperformance in RIIO-1, why does it consider there will be none in RIIO-2? Why has it not more fully explored targeting lower credit ratings and higher levels of gearing, possibly in combination with changes to depreciation and capitalisation rates, as potential aids to financeability? WWU has (alone) made a strong case for a bespoke Cost of Capital allowance to make its Actual Company financeable. It should be asked what it considers to be WWU's unique features which would make this appropriate for it alone among the GDNs.

ESO

1. **Planning an efficient energy system**: Based on our review across TO and ESO plans, we are not confident that either the TO's or ESO are considering all options (particularly the use of non-network solutions, flexibility resources, or smart grid technologies) to optimize future network investment costs. We have concerns that the NOA process is not working effectively and identifying options that will deliver a more efficient energy system. We think the ESO could be taking a greater leadership role to ensure RIIO-2 TO plans are optimised. We suggest the involvement of the ESO in RIIO-2 network planning is explored further.

2. **ESO cost increases**: the plan forecasts c£80m per year increase over RIIO-2 compared to RIIO-1, primarily IT costs. While the ESO is operating under a two-year price control, much of the additional IT expenditure will be committed at the start. We are concerned that detailed costs are not defined, and pass-through of costs means that consumers may bear the risk of cost overruns. We think the robustness of ESO cost forecasts should be explored further.

3. **ESO capability for IT delivery**: the ESO's proposed IT spend for RIIO-2 is in excess of £800m across 30+ projects, some of which are unique. We are concerned about the capability of the ESO to correctly scope and deliver these projects, and realise the predicted benefits.

4. **Reliance on National Grid Group**: despite the ESO having been legally separated from we are concerned about National Grid Group's dominant position (providing c75% of services to the ESO business as well as receiving dividends) and the influence this may have in terms of strategic direction and cost efficiency. We suggest this is explored to understand how the ESO has considered other delivery options and how it will address this issue in future.
5. **Output co-ordination:** the ESO's outputs are multi-faceted e.g. delivering a new balancing market platform and new arrangements for network planning with DNO's. We are concerned that the key interdependencies with other market participants, including Ofgem, are unclear thereby leading to potential delays or changes in scope. We suggest these areas are explored further.
6. **Leadership role:** we think the future role of the ESO e.g. is it a delivery body or a leader of change, needs to be more clearly defined. We are concerned that the ESO plan is currently more focused on delivery rather than leadership. We suggest that this area is explored further.
7. **Financing:** the ESO should be asked why, since its analysis shows that it could service debt on the basis of Ofgem's Cost of Capital WAs with ratios that are indicative of an A+ rating for both the Notional and the Actual Company, it considers the ESO's risk profile to be such that (under any of the scenarios under discussion as to the eventual scope of its responsibilities) 'additional annual revenues' of between £13 and 38 million are required to enable it to raise and service equity. What factors does it consider would warrant returns to equity so much higher than other parts of the regulated electricity sector (noting that, at 7.81%, the Cost of Equity allowance proposed for the ESO is itself over 50% higher than that proposed for the transmission companies?). Why does it consider that an additional 25bps on the Cost of Debt allowance to reflect the fact that the ESO is to be a standalone company is warranted? Why does it reject the concept of the 0.5% outperformance wedge? Why has it not more fully explored higher levels of gearing, possibly in combination with changes to depreciation and capitalization rates, as potential aids to financeability?

Annex 3: Glossary

AGI	Above Ground Installation
AICR	Adjusted interest cover ratio
BAU	Business as usual
BPDT	Business Plan Data Templates
CAI	Closely Associated Indirect costs
Capex	Capital expenditure
CBA	Cost-benefit analysis
CCC	Climate Change Committee
CCUS	Carbon Capture, Utilisation and Storage
CEG	Consumer Engagement Group
CPIH	Consumer Price Index inc owner-occupied housing costs
CRM	Customer relationship management
DNO	Distribution network operator
EAP	Environment Action Plan
EJ/EJP	Engineering justification paper
EMR	Electricity Market Reform
ENS	Electricity not supplied
ESO	National Grid Electricity System Operator
FES	Future Energy Scenario
FFO	Funds from operations
GDN	Gas Distribution Network
GHG	Greenhouse gas
GSOP	Guaranteed standards of performance

HV	High voltage
HVDC	High Voltage Direct Current
ICE	Internal combustion engine
ICF	Interruptible curtailment factor
IT	Information technology
LAEP	Local area energy plan
LO	Licence obligation
LRE	Load-related expenditure
LV	Low voltage
MOB	Multiple occupancy buildings
NAP	Network access policy
NARM	Network asset risk metric
NGET	National Grid Electricity Transmission
NGGT	National Grid Gas Transmission
NGN	Northern Gas Networks
NIA	Network Innovation Allowance
NIC	National Infrastructure Commission
NLRE	Non-load-related expenditure
NOA	Network Options Assessment
NTS	National Transmission System (gas)
ODI	Output delivery incentive
ODI-F	Financial output delivery incentive
ODI-R	Reputational output delivery incentive
OHL	Overhead Line

Opex	Operational expenditure
PCD	Price control deliverable
PRS	Pressure reduction station
PSR	Priority services register
PSSR	Pressure systems safety regulations
r£	Monetised risk (NARM)
RAG	Red/amber/green
Repex	Replacement expenditure (GDN's)
RORE	Return on Regulatory Equity
RPE	Real price effects
Saas	Software as a service
SF6	Sulphur hexafluoride gas
SGN	SGN (formerly Scotia Gas Networks)
SHET	Scottish and Southern Electricity Networks
SIU	Statutory Independent Undertakings
SO	System operator
SPAR	Selective protective asset replacement
SPT	Scottish Power Energy Networks/Electricity Transmission
SROI	Social return on investment
SWW	Strategic Wider Works
TO	Transmission operator
Totex	Total Expenditure
UCA	Unit cost adjustment
UG	User Group

UM	Uncertainty mechanism
VISTA	Visual Impact of Scottish Transmission Asset
WA	Ofgem working assumption
WWU	Wales & West Utilities