

Ofgem RIIO 2 IT and Telecoms Assessment

Network Companies Report

OFGEM

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Executive Summary

This report provides OFGEM with an independent assessment of the IT and telecoms (excluding cyber security) costs proposed by the Network companies running the gas and electricity transmission and gas distribution networks during the RIIO-2 period (2021-2026). RIIO-2 is designed to encourage the network companies to:

- Put stakeholders at the heart of their decision-making process.
- Invest efficiently to ensure continued safe and reliable services.
- Innovate to reduce network costs for current and future consumers.
- Play a full role in delivering a low carbon economy and wider environmental objectives.

A detailed assessment of the company's proposed IT and Telecom investments was undertaken based on the evidence provided from the December 2019 business plans and Supplemental Questions (SQ's) raised post their Business Plan submission. This assessment, drawing on the recognised (e.g. APM¹) attributes considered to contribute to successful project delivery, reviewed the strength and traceability of the business plans against 4 main criteria: project justification, planning, resource definition and costing assurity. A Red-Amber-Green (RAG) approach was applied by Atkins to each project or theme and the level of approved funding suggested. Where a project's justification was considered inadequate i.e. where Justification has received a Red mark, it has not been recommended for ex-ante funding at this stage. The funding treatment for justified projects, i.e. those with Justification of Amber or Green, are then RAG assessed against the other 3 criteria (planning, resource definition and costing), and subjected to a 'quality threshold' check based on a permitted number of Red marks. Varying the permitted number of Red marks from 3 (project is funded even with 3 Reds), 2, 1 and 0 (funding requires 0 Reds) provides a measure of the sensitivity of each company's funding to the number of Red marks and hence the level of perceived project maturity predicated on the quality of evidence available.

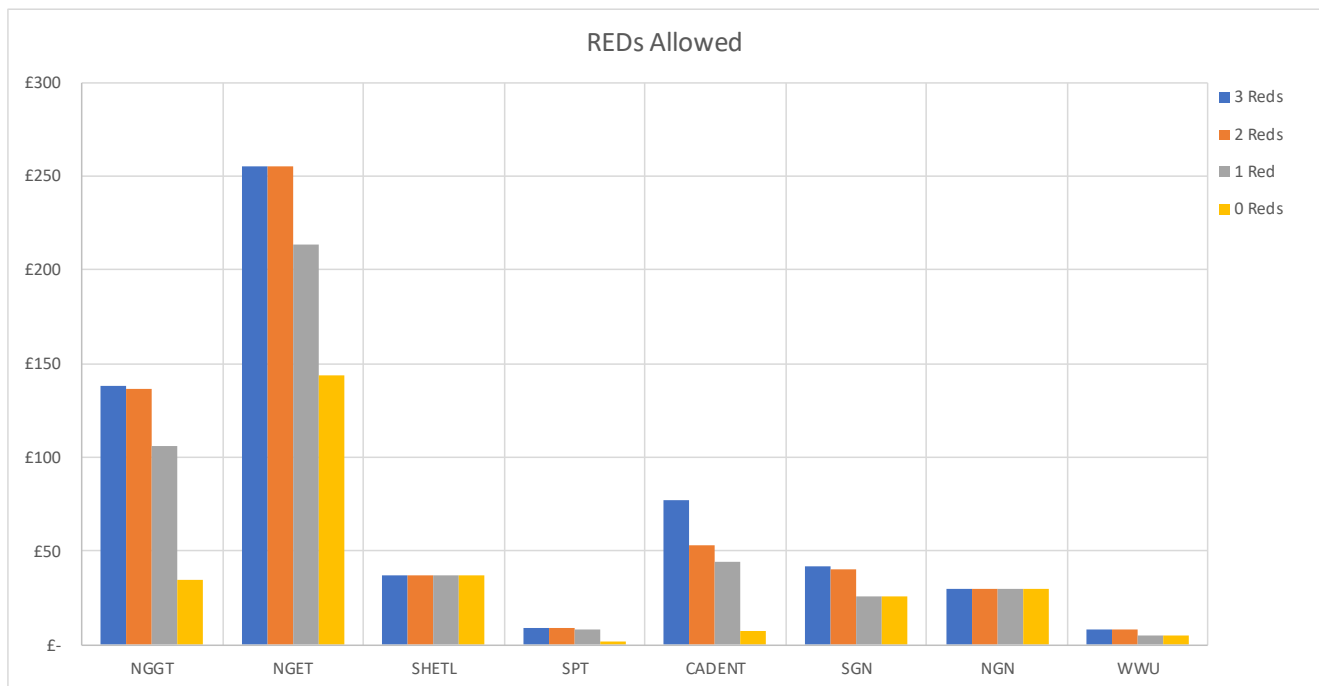
Note: The assessment results shown in the body of this report relate to the case where the presence of any 'RED' marks results in the ex-ante funding for that activity to be set to zero.

The following tables and chart show the suggested number of justified projects and the corresponding Non-Op Capex ex-ante funding as the number of permitted Red marks is changed.

Projects	REDs Allowed			
Company	3	2	1	0
NGGT	51	50	35	6
NGET	12	12	11	5
SHETL	14	14	14	14
SPT	15	15	14	4
CADENT	19	10	7	1
SGN	14	13	8	8
NGN	4	4	4	4
WWU	3	3	1	1

£	REDs Allowed			
Company	3	2	1	0
NGGT	£ 138.43	£ 136.71	£ 106.27	£ 34.88
NGET	£ 255.62	£ 255.62	£ 213.54	£ 143.55
SHETL	£ 36.62	£ 36.62	£ 36.62	£ 36.62
SPT	£ 8.52	£ 8.52	£ 7.95	£ 1.64
CADENT	£ 77.15	£ 53.06	£ 44.10	£ 7.37
SGN	£ 41.63	£ 40.13	£ 25.37	£ 25.37
NGN	£ 30.08	£ 30.08	£ 30.08	£ 30.08
WWU	£ 8.18	£ 8.18	£ 5.07	£ 5.07

¹ The Association for Project Management <https://www.apm.org.uk/>



This analysis shows that where companies have provided a lower level of detail, evidence and traceability in their business plans and supporting documentation, the suggested ex-ante funding falls considerably as the tolerance to Red marks is reduced. This will generally be reflective of the relative maturity of projects and hence the quality of evidence available to substantiate the funding request. Where a company's submission scores no Reds e.g. SHETL, then there is no reduction in the recommended funding for those projects considered to be adequately justified.

The key findings from this report can be summarised as follows;

- The initial examination of both the financial and strategic elements of each company's submission revealed similar issues. There is often little evidence of a quantitative analysis underpinning the investment funding sought for the proposed initiatives and projects. In most cases the figures presented appear to be the 'values' copied from a more functional calculating workbook.
- There is often limited evidence available to support the strategic timing of the projects. Partial information is given, however many of the projects across most companies are very much in their infancy and therefore the quality of data provided has been insufficient to enable a robust or in-depth analysis.
- However, the strategic rationale for the projects in most cases was justified, providing sufficient evidence to support the need – but the proposed benefits were not recognised or understood in detail at a project level.

Our assessment has taken account of the strategic alignment of the business plans to the business strategy and a detailed review of the proposed investment costs. Conclusions and recommendations are made against each company within the report for further consideration by OFGEM.

1. Introduction

Ofgem has requested that Atkins undertake a review and assessment of the RIIO2 cost submissions from the network companies, relating to the IT and Telecoms (excluding cyber security) aspects of each company's business plan and provide an informed and evidenced opinion on:

1. The validity of the needs cases associated with the IT and Telecom cost elements of these plans by the companies across all sectors; this will consider IT strategy; linkage to technology architecture (current and proposed); appropriateness of proposal as well as any potential complementarities/trade-offs with other costs.
2. The appropriateness of cost levels associated with the proposed work plans, and whether these constitute value for consumers' money. Culminating in a view of efficient spend for IT & Telecoms within the cost categories listed above.

Section 2 discusses the methodology and approach developed to assess the RIIO-2 submissions for IT and Telecoms expenditure provided by each company. The following sections discuss the findings of Atkins' review and analysis of the company's submissions.

2. Methodology and Approach

2.1. General Financial Process

2.1.1. Overview of Assessment Approach

Atkins' assessment approach is based on the analysis of the traceable evidence supplied within the company's submissions and the supporting documentation provided in response to Supplementary Questions.

The approach envisaged by Atkins and upon which Atkins' programme of assessment was based, was predicated on the network companies' provision of transparent and robustly evidenced cost forecasting models, presented from the bottom-up to justify the costs presented in their Business Plan Data Templates (Tables) (BPDT). Provided with the calculations by which the BPDT and business plans were populated, Atkins proposed to

- validate i.e. test that the cost models were designed to deliver the appropriate results and were populated with valid and traceable input data and
- verify that the model internal calculations were correct, containing no computational errors.

However, it was not possible to implement this approach due the nature and quality of the network company submissions. In summary:

- The detailed project discussions presented in the business plans and supporting annexes focussed on the benefits delivered by the projects to support the identified stakeholder themes and objectives i.e. the why, rather than explanations of the how, when, where and by whom the outcomes would be achieved;
- The basic financial data was provided within formalised BPDT and Cost Benefit Analysis Microsoft Excel templates. A positive aspect of providing templates is that there is a recognised and standardised structure and view of the financial data provided by the companies. However, the companies were only required to respond to the submission templates by providing values into the appropriate cells rather than linking to external documents. This, unfortunately, then made the embedded results untraceable within the template and not possible to validate by reference to any external data source.

The robust evidence required to provide confidence that the proposed investments would successfully deliver the envisaged benefits described in the business plans would include a detailed plan for the execution of the project including, inter alia a delivery schedule, a description of the programme of analysis, development and implementation to be conducted, the resources required to undertake the project and the costs of those resources e.g. manpower, hardware, software and facilities. This scope corresponds to that described in the GREEN category in Table 2-2 - Qualitative RAG Criteria.

Atkins' initial response to the level of detail available was to raise Supplementary Questions (SQ) to each network company seeking responses providing transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan of the following information:

1. A description of the context for the project e.g. a contribution to 1 or more strategic themes;
2. A description of the intended project outcomes i.e. what it delivers;
3. A definition of the proposed solution including architecture, new hardware and software components and additional resources e.g. facilities and skills;
4. The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN;
5. The identification of any activities dependent upon this project i.e. what else does this project enable;
6. The plan for project execution i.e. a schedule showing when significant activities will occur e.g. milestones;
7. A work breakdown structure for project delivery;
8. Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs;
9. A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project;

10. The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs.

In most cases the initial responses to the SQs were not significantly helpful as they failed to provide the requested detail and traceability as requested above. All SQ's raised are provided in Appendix A.

At the outset of the assessment, and in the absence of detailed and traceable quantitative evidence, only a broad-brush RAG assessment of the information presented was possible and in response Atkins developed an initial high-level qualitative approach.

To derive indicators of the quality and value of the presented information Atkins initially assessed each company's submission against 2 criteria:

1. Is information available to provide confidence in the validity of the estimates quoted in the subject company's business plan and business plan data template? This may be achieved by the provision of a supporting cost model for the proposed technical solutions for the investments under consideration or a deep-dive presentation of a sample of key investments which demonstrate the estimation method employed.
2. Is information available to enable the determination of the impact of a change to key or cost driving assumptions employed in the characterisation of the solutions described for the proposed investments?

To translate the qualitative RAG assessment into a quantitative valuation Atkins developed a framework reflecting the assessed quality of the evidence presented against a scale of 0% to 100%. The numeric boundaries adopted to correspond to the RED – AMBER - GREEN bands were determined through the application of experience and professional judgement balanced within a framework of contextual factors e.g. a desire to apply a set of consistent values for all investments across all the network companies, a desire to enable projects to proceed where considered beneficial by Ofgem or strongly justified by the proposing company, encourage the proposing company to increase the quality or maturity of the supplied information and in consideration that, in developing the forecasts, the companies may have added some time and cost contingency to account for the estimating uncertainty and anticipated risk events. The bands associated with the RAG categories boundaries were discussed and the baseline assessment values agreed with Ofgem. The framework is embedded within the assessment workbook to enable Ofgem to undertake 'what-if' and sensitivity analyses to explore the impact of varying the quantitative boundaries.

The initial quantifying values shown in Table 2-1 were chosen and agreed through discussion with Ofgem to illustrate the range of supplied data quality and the consequential assessment.

Category	Top of Band	Bottom of Band	Adjustment Factor	Criteria
Green	100%	75%	95%	Satisfies 1 and 2
Amber	75%	35%	55%	Satisfies 1 or 2
Red	35%	0%	20%	Satisfies none

Table 2-1 – High Level RAG Assessment Criteria

As additional project focussed information was received by Atkins in response to SQ's or deep-dive sessions, a more refined approach was developed that considered 4 more detailed criteria, drawing on the recognised (e.g. APM²) attributes considered to contribute to successful project delivery. This more detailed approach was applied to the information provided to support proposed Non-Op Capex investments and is discussed below (2.1.2). For the Opex CAI and BSC costs, where limited visibility of the build-up of costs was evident, the high-level approach continued to be employed, albeit moderated to consider the annual costs recorded during the RIIO-1 period compared to those forecast for RIIO-2. This comparison is discussed in more detail in section 2.1.3.

² The Association for Project Management <https://www.apm.org.uk/>

2.1.2. Project focussed RAG assessment

Introduction

This section of the report describes the methodology developed by Atkins to assess each RIIO-2 IT and Telecom project proposed by each company. A qualitative Red – Amber – Green (RAG) judgement was made of each company's submission and, through a translation of the RAG to a quantitative equivalence, a suggested ex-ante allowance of the proposed IT and Telecoms costs evaluated.

The bands associated with the RAG categories boundaries were discussed and the assessment baseline values agreed with Ofgem. The framework is embedded within the assessment workbook to enable Ofgem to undertake 'what-if' and sensitivity analyses to explore the impact of varying the quantitative boundaries.

The assessment considered the material provided by the companies along with SQ's and developed an overall RAG for each project. The RAG assessment addressed 4 criteria, shown in Table 2-2, which embody the following thinking:

Project Justification

There should be a compelling case for investment in the project based on delivered benefits. This could be the adoption of new technology, the provision of new customer focussed services or the replacement of obsolete existing in-service capabilities delivering increased efficiencies or customer experience; or reduced costs or risks.

Although the assessment of the 'Project Justification' criterion may result in a recommendation that the project's ex-ante funding be withheld, the additional 3 criteria were, nonetheless, evaluated. Such that, if the project's justification be strengthened in the future, the RAG assessment results can be employed as a reasonable starting position, recognising that strengthening a projects justification may result in secondary improvements to other criterion.

Project Definition

The key to successful project delivery is an understanding of the project requirement i.e. what the project aims to achieve, enabling the development of a robust plan to achieve that objective. The plan should address, commensurate with the maturity of the project, a schedule of the activities, and their interdependencies, necessary to complete the project and a work breakdown structure that reflects the plan which can be resourced and then costed. The plan should also address the facilities and management structure to monitor, manage, and authorise the venture and include the means by which risks (and opportunities) will be captured, reviewed and managed. Although many of the proposed projects are in an early phase of their lifecycle, estimates of project delivery may be drawn from historical data and trend analysis and alignment with such data increases confidence, and hence the RAG Score of the project in question.

Project Resources

A detailed project plan enables the definition of the resources necessary to achieve the plan. Resources in this context encompasses any costs that falls to the project e.g. manpower, software and hardware procurement, 3rd party services, facilities and system design, development, testing, integration, documentation and training.

Cost Assurity

A forecast of the project delivery costs can be derived by associating a 'cost per' estimate for each entry in the resource plan. It may be expected that uncertainty and risk costs be included in the calculation of project delivery costs.

Consequently, the first 3 criteria are sequentially dependent upon each other i.e. without a sound plan, the required resources (manpower, materials, facilities, etc.) cannot be estimated and without an understanding of the resources, a cost cannot be forecast. Hence, the overall quality in the proposal and confidence in the quantitative presentation is cumulative and a function of all three criteria.

The RAG assessment undertaken assesses the quality and confidence provided to the assessor for each criterion for each considered object. The assessment addresses if there is evidence detailing the attribute under consideration for the assessed item and then the confidence provided to the assessor that the evidence is reasonable and correct. If there is good, traceable, high quality information considered to be correct, then the criterion will be marked 'Green'. If there are gaps in the completeness or consistency of the supplied information, then the criterion will be marked 'Amber'. If there is limited evidence of analysis or significant gaps in the information supplied, then the criterion is marked 'Red'.

Note: The assessment results shown in the body of this report relate to the case where the presence of any 'RED' marks results in the ex-ante funding for that activity to be set to zero.

Topic	Area of review	Green	Amber	Red	Notes
Justification for project	Is there a good understanding of why the project and resultant benefits needs to be delivered?	Strong justification for project based on e.g. sustainment, technology upgrading or replacement of existing capability, enabler for other key capabilities or projects, legislative or safety need.	Insubstantial justification for project (i.e. 'nice to have', early or unnecessary upgrade)	Little or poor justification for project.	Although Atkins' undertook a RAG assessment of each project's justification, as a development of the process, the RAG was converted to a "Go / No Go" – "Pass / Fail" criterion such that the allowed funding for the project was set to zero if the project justification was judged inadequate. The initial Go mark was GREEN or AMBER.
Project definition including the elements associated with the planning and management of a project, a Project Plan detailing the timing, scale, contributors, risks and dependencies considered to successfully deliver the project benefits. These characteristics are drawn from recognised project management	Is there a good understanding of what the project is and when and how and with what it will be delivered?	Well defined with significant detail, possibly a follow-on of an existing project. Mature discussion of risks and their management. (i.e. Work Breakdown or High-level project plan present, clear description of tasks, responsibilities and dependences	Some definition of a future project (e.g. The benefits to be delivered by the Project have been identified and initial project definition has been undertaken to provide an overview of the activities it will be conducting.)	Little or poor definition (e.g. the purpose of the Project has been identified, but minimal project definition has been conducted.)	

Topic	Area of review	Green	Amber	Red	Notes
methodologies e.g. APM.		(including their timing))			
Definition of required Resources	Is there a good understanding of who, where and with what the project will be delivered?	<p>Well defined statement of required resources</p> <p>(i.e. number units for internal staff, 3rd party supplier, hardware and licencing are listed and are linked to unit costs. Variation in the number of units is shown and tracks an appropriate delivery methodology (i.e. Waterfall or Agile), with costs ebbing and flowing during the project lifetime and associated splits of spend changing over time)</p>	<p>Some definition of required resources</p> <p>(i.e. there are distinct budgets for internal staff, 3rd party suppliers, hardware and licencing, however the time profile is static and does not reflect typical ramp up and down phases. Split of resources is rule-based (such as Staff =50%, hardware =25%)</p>	<p>Little or poor resource definition</p> <p>(i.e. there is no breakout of internal staff vs 3rd party suppliers, hardware, licencing costs)</p>	
Cost Assurity	<p>Is there a good understanding of how much the project will cost to be delivered?</p> <p>Does the forecast cost include uncertainty in e.g. project scaling unit costs and are the project risks included?</p>	<p>Well defined, transparent and consistent cost build-up based on traceable methods and data; aligned with Gartner benchmarking, historical trends or similar projects.</p> <p>(i.e. Underlying costs are individually listed with an</p>	<p>Limited quantified calculations of cost build-up. Cost evidence poor. Treatment of risks poor.</p> <p>(i.e. Cost build-ups have been provided, but the elements are assumption based or if derived from previous projects scaling factors are not justified.</p> <p>A very limited number of risks (1-2) will be listed,</p>	<p>Little or poor evidence of cost build-up. Estimates appear exaggerated or optimistic. Treatment of risks absent.</p> <p>(i.e. Single numbers are presented for the entire project cost; they will be presented in order of</p>	

Topic	Area of review	Green	Amber	Red	Notes
		<p>associated source and uncertainty (i.e. +- 10%), these are linked using excel formula to present the claimed project cost</p> <p>a comprehensive set of project specific risks are listed which detail specific areas, the risk will be costed along with cost of any mitigation and the value of any residual risk. Opportunities will also be listed)</p>	these maybe at a generic level and only have RAG level assessment of likelihood and impact).	magnitude terms)	

Table 2-2 - Qualitative RAG Criteria

RAG Quantification

To quantify the RAG mark for each project and enable the estimation of the project budget, the 3 criteria RAG mark was converted to a numeric score by combining the equivalent RAG marks for each project in accordance with the scoring scheme shown in Table 2-3. A factor to reflect the criteria-to-criteria relative importance is included to represent the assessed significance of each criteria. The Relative Importance factor is expressed as a percentage across each of the 3 criteria.

The 2 sets of assessment parameters relating to the 'Criteria Relative Importance' and the 'RAG marks' have been implemented as variables within the assessment Excel workbook tool. The variable values reflected in the presented results i.e. 'Relative Importance' = 40% - 30% - 30% and RAG marks = 1 – 2 – 3, were based on Atkins' experience and reflect the importance and cost confidence derived from each of the assessment criteria.

Relative Importance	Binary	40%	30%	30%
Criteria	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Green	1	3	3	3
Amber	1	2	2	2
Red	0	1	1	1

Table 2-3 - Quantitative RAG scoring scheme

The assessment reported upon in this report employed the scoring scheme presented in Table 2-3. The Relative Importance factors and R-A-G scores were considered sufficiently discriminatory for the initial assessment.

The quantitative RAG score was converted to an appropriate funding scaling factor using a relationship shown in Figure 2-1.

The example conversion values are shown in Table 2-4. Note that to incorporate the Relative Importance factors, the composite RAG Score is calculated as a weighted value of the sum of the product of the RAG score for each criterion and the Relative Importance of that criteria. This assessment structure was implemented within the assessment framework to provide flexibility and support e.g. sensitivity analyses. The baseline Upper and Lower bounds for the RAG mark to RAG score relationship i.e. 100% and 75% were discussed and agreed with Ofgem and represent the balance of estimation uncertainty resulting from project immaturity, built-in contingency to address estimation uncertainty and risks, and an inadequacy of project definition.

RAG Dynamic Range = ALL_GREEN to Low_Bar	3	2
RAG Funding Factor = MAX_GREEN to All_Amber	100%	75%

Table 2-4 - RAG Score Conversion Scaling Limits

A linear relationship is assumed between an ALL_GREEN mark (3 in this example) that scores MAX_GREEN e.g. 100% of the funds sought and a Low Bar mark (2) equivalent to a score of All_Amber (75%). Also note that the minimum RAG Funding Factor was set to 75%, even if the RAG Score was less than the notional Low_Bar.

A composite RAG factor is computed as the weighted mean of each project's sought funding and the RAG factor for the range of all projects in that company's RIIO-2 portfolio. The composite factor is then applied to the total requested Non-Op CAPEX included in the company's BPDT. Where a RAG score is less than the 'Low_Bar', then the funding associated with the investment would be subject to an Uncertainty Mechanism (UM) defined by Ofgem.

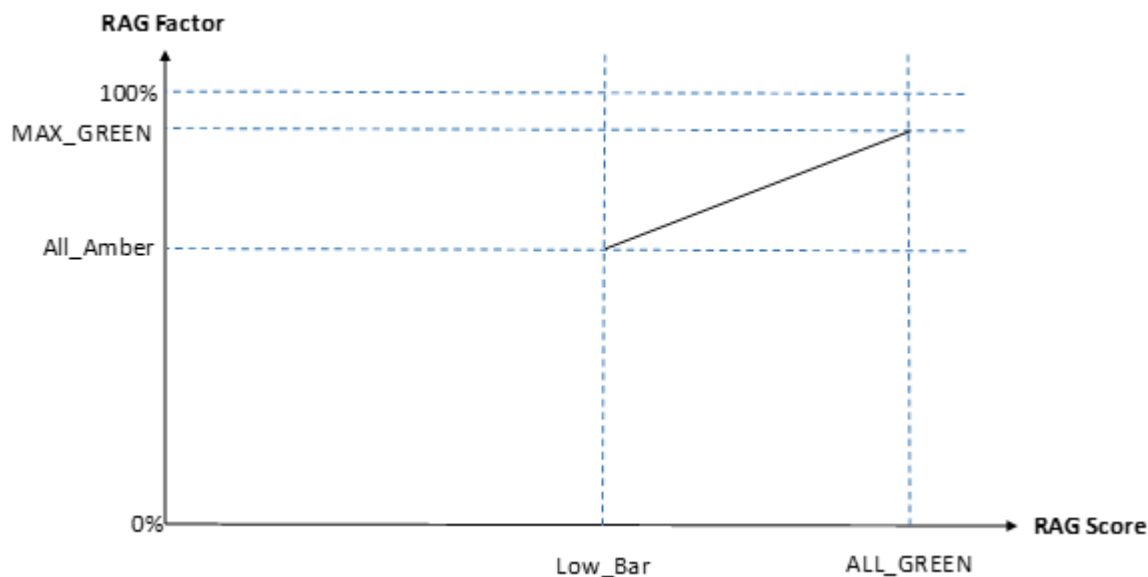


Figure 2-1 - RAG Score to RAG Factor Conversion

Sensitivity Analysis

A sensitivity analysis was conducted whereby the proposed ex-ante funding for each project was approved or not based on the number of RED RAG assessments within the 3 RAG criteria (planning, resource definition and costing). Hence, this is an evaluation of the tolerance to the overall quality and confidence in the company submissions and provides a quantitative indication of the number of approved projects and their potential ex-ante funding as the number of allowed REDs is varied from 0 (baseline) to 3 (most tolerant). At the extremes of the assessment, if 3 REDs are allowed, then all justified projects are considered for funding. The funding is then a function of the RAG Score, as discussed above. If no REDs are permitted, then any project with a RED RAG assessment is rejected for ex-ante funding, even if considered justified.

Note this assessment only includes those projects which are adequately justified i.e. not RED by the 'Justification for Project' criteria. The initial summary of the sensitivity results is below.

Table 2-5 shows the number of approved projects per company as the number of allowed REDs is varied from 3 to 0.

Projects	REDs Allowed			
Company	3	2	1	0
NGGT	51	50	35	6
NGET	12	12	11	5
SHETL	14	14	14	14
SPT	15	15	14	4
CADENT	19	10	7	1
SGN	14	13	8	8
NGN	4	4	4	4
WWU	3	3	1	1

Table 2-5 - Company projects per Allowed REDs

Table 2-6 shows the potential funding for projects per company as the number of allowed REDs is varied from 3 to 0, assuming a minimum RAG Funding Factor was set to 75%, even if the RAG Score was less than the notional Low_Bar .

£	REDs Allowed			
Company	3	2	1	0
NGGT	£ 138.43	£ 136.71	£ 106.27	£ 34.88
NGET	£ 255.62	£ 255.62	£ 213.54	£ 143.55
SHETL	£ 36.62	£ 36.62	£ 36.62	£ 36.62
SPT	£ 8.52	£ 8.52	£ 7.95	£ 1.64
CADENT	£ 77.15	£ 53.06	£ 44.10	£ 7.37
SGN	£ 41.63	£ 40.13	£ 25.37	£ 25.37
NGN	£ 30.08	£ 30.08	£ 30.08	£ 30.08
WWU	£ 8.18	£ 8.18	£ 5.07	£ 5.07

Table 2-6 - Company funding per Allowed REDs

Figure 2-2 shows the reduction in funds, company by company as the number of allowed REDs is varied.

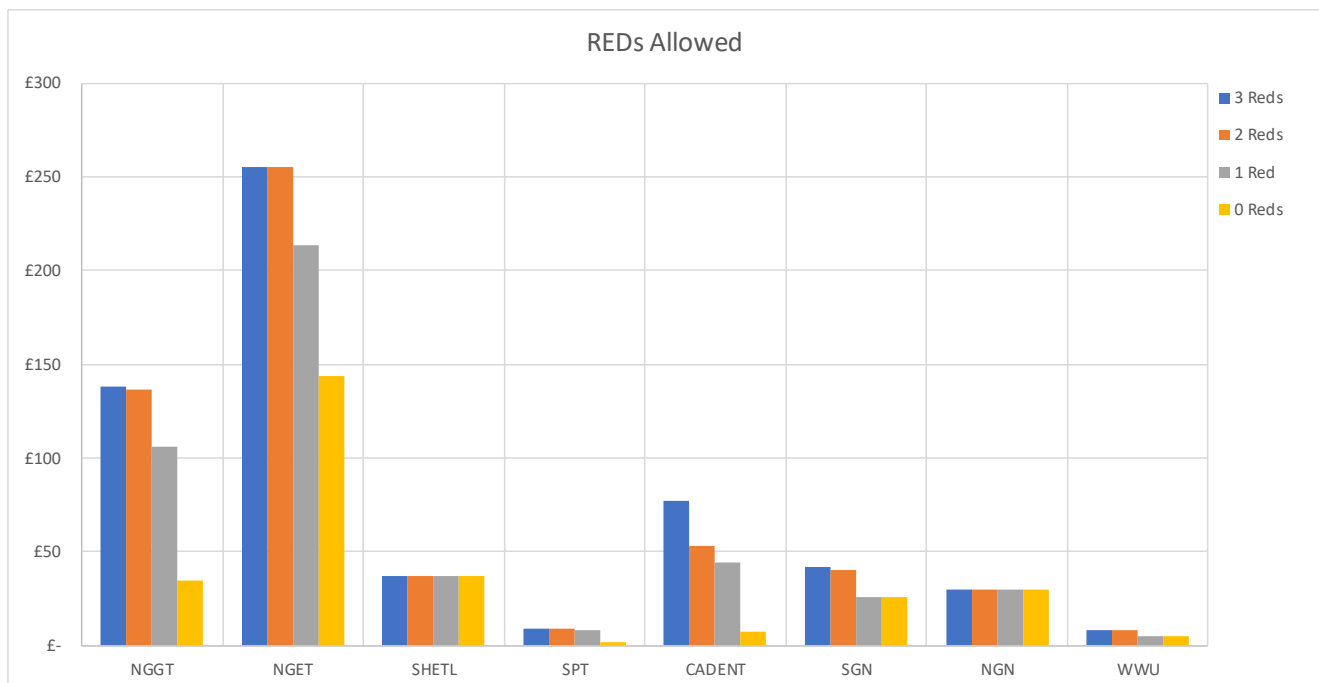


Figure 2-2 - Company funding per Allowed REDs

2.1.3. Opex RAG Assessment

This section describes the method of estimating the proposed funding for the company Opex costs i.e. CAI or BSC. Generally, the level of detail available to assess the validity of the company forecasts of future Business as Usual (BaU) expenditure is poor and was insufficient to support the type of RAG assessment undertaken for the IT and Telecoms Non-Op Capex projects. Only a broad-brush RAG assessment of the information presented was possible as discussed in section 2.1.1.

Where Opex costs were associated with project initiatives that were assessed in accordance with the RAG process described in 2.1.2, then those costs have been factored in line with the project's Non-Op Capex costs. The BAU costs cannot be directly attributed to the project forecasts and in this case the RAG assessment of the Opex funding is based on the criteria detailed in Table 2-7. The quantifying values shown in Table 2-7 were agreed through discussion with Ofgem, drawing on Atkins' experience and judgement.

Category	Top of Band	Bottom of Band	Adjustment Factor	Criteria
Green	100%	75%	95%	Satisfies 1 and 2
Amber	75%	35%	55%	Satisfies 1 or 2
Red	35%	0%	20%	Satisfies none

Table 2-7 - Open RAG Assessment Criteria

In the absence of detailed discussions and explanations of the method of forecasting future BAU costs, the RAG assessment was supplemented by an approach which compared past (RIIO-1) annual costs with those forecast for RIIO-2. It was noted that the annual Opex budgets in RIIO-2 were similar to those consumed during RIIO-1 and therefore the RIIO-1 annual costs represented a reasonable baseline on which to base the RIIO-2 values. Recognising this continuity, 2 solutions for the future costs were adopted.

If the future mean annual RIIO-2 costs are less than the mean RIIO-1 costs, then the RIIO-2 costs are accepted without modification; see Figure 2-3.

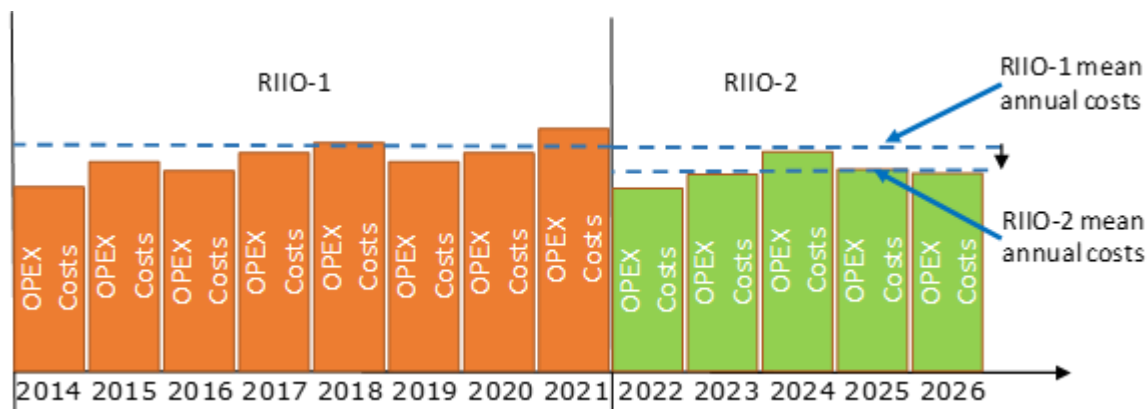


Figure 2-3 - Opex forecasting approach 1

If however, the average RIIO-2 costs are forecast to be higher than the historic RIIO-1 equivalents, the proposed RIIO-2 funding is reduced by the RAG assessment e.g. if the RAG assessment of a company's submission is Amber, then as an example, based on the figures in Table 2-7, it would be proposed that the RIIO-2 funds be 55% of those requested; see Figure 2-4.

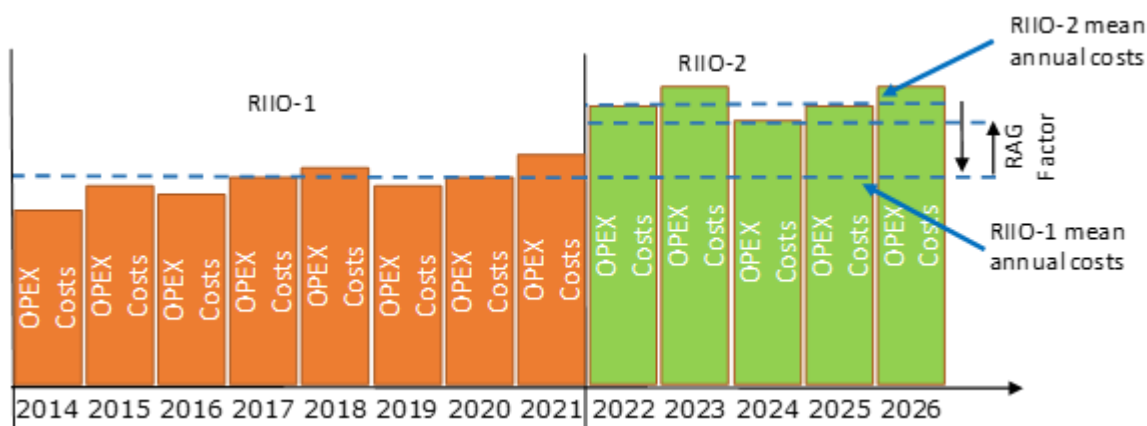


Figure 2-4 - Opex forecasting approach 2

3. NGET

3.1. Overview

NGET's business plan lacked detail, however additional information such as project plans has been provided through the SQ process and bilaterals requested by NG which provides some confidence in the company's ability to deliver its intended projects.

There is no one area of significant concern, though NGET recognises the need to change, the plan contains signs to suggest a lack of understanding around what this means in practice and what transformational changes across all aspects of the business will be required to meet the legislative changes. The plan also shows a lack of understanding of the workings of specific technologies available to impact positively on the business.

Refer to Appendix A for SQ's raised and received during the valuation process.

3.2. Key Findings

Overall Business plan

NGET states 'Our target is to reduce our own direct greenhouse gas emissions to net zero by 2050' and claims flexibility will deliver this. However, there is a paucity of detail on what this flexibility is, how it will be delivered and when and what steps are needed or by whom, to make this flexibility happen.

NGET recognises that it needs to change its practices to secure and maintain an engaged workforce to realise its strategic objectives and technology will be an enabler of this. However, the company has not translated that knowledge into the practice of doing different things. In fact, it explicitly states that having flexible diverse ways of working and a workforce used to interconnect ways of working does not imply reduced office space or cost savings. Whilst the necessary transformational change will inevitably require investment including investment of those projects proposed as part of the IT strategy it may not necessarily lead to direct financial savings. If NGET is truly committed to achieving zero net carbon by 2050, then it is essential to change its working practice, by looking at every aspect of everything it does, including reducing office space and carbon emissions of commuting by encouraging remote ways of working which may well reduce office space needed, thus reducing costs, savings which could be used to offset investment in other areas.

Overall, the NGET plan is competent, but unambitious, conservative, providing a possible unrealistic sense of confidence to deliver. Additionally, it is a pedestrian business plan, with insufficient detail on how the IT investments support the overall ambition of the company. There appears not to be a sense of urgency nor is there a sense that change is a must. Rather, the business plan leaves the impression that achieving net zero appears to be an optional target that NGET is keen to meet. The business plan states: 'a saving of at least £707m' and that NGET 'are committing to finding a further £383m of efficiency savings' resulting in reduced consumer bills of £23.60 per customer. Technology will be a key enabler of their ability to achieve the stated benefits, through doing things differently.

The company has responded to raised SQs, although the expected level of detail was not provided, especially around the time and resource required for testing and/or piloting the proposed IT changes. The deep-dive documentation did however provide some insights that are discussed as part of the cost analysis section.

On cultural changes, for example as a result of implementing its digitisation programme, NGET simply states: 'Throughout RIIO-T1 as part of our NIS improvement plan, we will develop the necessary process and training to ensure these controls are effective. These business changes will be delivered in an integrated way with each control throughout RIIO-T2'

This approach potentially underestimates the cultural changes required to meet net zero carbon changes. There is a paucity of detail on the skills required, what infrastructure, sponsorship or collaboration is needed to support the development of these skills by when or what dependencies are involved.

IT strategy

The IT investments proposed by NGET aim to rationalise and modernise their IT systems and Infrastructure to provide a reliable and cyber secure environment, providing a foundation for NGET to digitally transform their business. The key drivers for the IT investments are;

- Asset replacement of aged application and infrastructure to maintain reliable and secure services.
- Enhance enterprise IT cyber security capabilities in response to an increasing level of cyber threat

- Replace and separate core CNI systems
- Capability enhancement and foundation for digital transformation, e.g. exploit Artificial Intelligence.

However, NGET's IT strategy is not as mature in its approach as would be expected. It has provided insufficient detail on project interdependencies and what is required by when. From the information provided, NGET may well achieve its stated activities but runs the risk of being left behind from the wider socio-political-technological changes in the wider community/country. Their IT strategy acknowledges the technological and political trends but does not explicitly detail how they will respond and the benefits that could be derived from the technological advances.

On its projects and in response to the raised SQ's, NGET states: *'IEMS is a defined Critical National Infrastructure (CNI) asset and as such could be of the highest priority'*. NGET considers all its remaining IT projects are essential, but no risk analyses have been undertaken due to the proposed investments being in the earliest stage of development. It would be expected that risk analysis is integral to early stages of any activity, however this has not been provided as part of the evidence received or as part of any follow up sessions or SQ's. . The only risks that appear to have been considered by NGET are those which are identified as potentially impacting their overall ability to deliver in T2, discussed in the delivery section further down.

The insufficient evidence to demonstrate NGET's understanding of the risk associated with each project, has been reflected in the overall RAG assessment and in the general view of IT Maturity and Cost Assurity.

Based on the information provided, NGET's data sharing and data interoperability plans are immature in their development and provide insufficient detail, limiting the ability to make any informed judgement on their appropriateness, effectiveness or of fitness for purpose.

Of concern is its response to SQ 14.

"Our systems will need interfaces and accessibility to support flexible working, diversity, a more open and social approach to collaboration." This reference relates to the changing expectation of the workforce with Y and Z generation having grown up in a connected culture. It does not imply cost savings or reduced office space; it simply reflects that with a changing workforce IT will need to deliver flexible approaches to work in order to secure and maintain an engaged workforce.

A detailed review of each individual project is captured in the Project RAG spreadsheet. In general, the following trends have been identified:

- The quality of the submissions is competent with enough detail to understand the strategic rationale for the projects and the options analysis; however, the benefits are not clearly defined, and modelling has not been undertaken to understand when they will be realised.
- The projects were however poorly defined at an individual level, with poor work break down structures and resource requirements with the exception of those provided through the deep dive.
- Roadmaps have not been provided at this stage to show the timing, but outline timelines are given for the majority to show where in the RIIO-2 period they will be delivered along with a summary portfolio view.
- Most projects are focussed on moving off bespoke, customised capabilities to leverage external cloud-based solutions.
- There are several examples however where capabilities will continue to be shared with ESO or NGGT (e.g. enTrader and their GIS solution) which presents a risk of a large investment being need in RIIO-3 to address divergence in RIIO-2 if it were to occur;
- Significant investment in end user tools to automate and standardise processes and providing easier access and better reporting capabilities. It is not clear if they could be driving more efficiencies and economies of scale through aligning the digital solutions, rather than different technologies for different projects.

Delivery approach

NGET supplied a high-level project plan in response to SQs that does provide a degree of confidence that it has the level of detail required to deliver its strategy. It notes some interdependencies between IT and Cyber security projects, though not in any detail, particularly regarding wider business practices. The deep-dive session

highlighted delivery approaches aligned to portfolios of development and delivery activities by capability. NGET follow the Prince delivery framework, ensuring project boards hold the delivery team to account for time, cost and quality throughout the delivery cycle. Whilst these delivery approaches are understood as an overall approach to delivery, they have not been applied and understood at a project level, except for a discussion on those projects detailed in the deep dive, which outlined the risk of not doing the project.

Delivery risks for each project have not been identified, however the following strategic risks have been considered, and are applicable across each project. The proposed mitigations are immature in their development and furthermore it is not understood if these risks have been analysed and quantified for each project.

Risk	Mitigation
Cost Saving targets not achieved	Deep dive sessions are ongoing to establish options
IT do not have the capacity to deliver	IT transformation streamlined with supplier sourcing, insourcing of key skills and establishing partnerships with other business functions. IT will continue to streamline internal governance processes, minimise bureaucracy to increase throughput without compromising quality
The business does not have the capacity to deliver.	Monitor the impact of driving efficiency in the UK on the ability of allocated resources to meet the appetite for new business initiatives across the UK business. To meet the UK plan, drive significant efficiency gains annually for the remainder of T1. Choices must be made on business demands and level of services.

The lack of detailed information supports the possibility of the infancy of the projects and demonstrates the work that is to be done as projects mature in their thinking and development.

Workforce Resilience

All its training costs are shared functions covering ET, GT and ESO:

All staff training/Computer based training budgeted at £200k Opex per annum; IT technical staff training £300k Opex per annum; Security Team technical and development training ~£480k Opex per annum and Advanced cyber training £200k Opex per annum.

These costs appear to be low but more importantly seem to underestimate the scale of the training required to transform its business as its costs appear to be attached to basic level of training needs only.

Approach to change management

NGET is a complex organisation and as such we acknowledge the inherent challenges in undertaking radical change. However, its proposed approach to meeting the legislative targets risks needs further refining as it is considered "unresponsive to the changing demands and wider technological, social and geographical changes happening around it.

There is a focus on IT infrastructure, hardware and software, with less focus and understanding on the changing nature of the workforce which will require changed skills and experience as well as changed work practices. Its responses to the SQ in this area do not provide the level of confidence sought, though this does not imply that NGET has not considered these areas, merely that it has not supplied the information.

This is a plan that requires a greater appreciation of the need for more radical change required.

3.3. Cost Analysis - Key Findings

The review of NGET documentation identified 11 projects with a total funding requirement of £325.54m and an additional £11.47m in 'other IT expenditure', making a total of £337.0m of Non-Op Capex.

Information regarding NGET IT&T projects was contained within the IT Investment Annex (NGET_A14.07_ET) and several supporting Investment Decision Papers along with associated high-level Cost Benefit Analyses. Cost models showing spend and type profiles were provided as part of the SQ process. Deep Dive meetings on 20th

February and 24th March gave greater detail of the processes applied around costing and the development process for these cost models.

A summary of the projects and their RAG assessment is provided in Table 3-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Control centre and network management systems	Amber	Red	Red	Amber
Portfolio and plan optimisation capabilities	Amber	Amber	Amber	Amber
Infrastructure	Amber	Amber	Amber	Amber
Condition monitoring and analytics	Amber	Amber	Amber	Amber
Innovation and whole energy system digitalisation	Amber	Amber	Red	Amber
Corporate & Business Services	Amber	Amber	Amber	Amber
Asset registry and work management systems	Amber	Red	Amber	Amber
Other asset health driven investments	Amber	Red	Amber	Amber
Customer Relationship Management (CRM) system for connecting customers	Amber	Red	Amber	Amber
Customer Relationship Management (CRM) system for non-connection customers	Amber	Red	Amber	Amber
Self-service website for connecting customers	Amber	Red	Amber	Amber
Other IT Expenditure	Green	Green	Green	Green

Table 3-1 - NGET Project RAG Assessments

Project definition including timing, scale and dependencies

In general, projects were defined but lacked associated Work Breakdown Structures. There is some reference to historic projects to form a baseline, but how RIIO-2 projects are scaled from these is unclear.

A “T-Shirt” model was used to assess the complexity of the individual projects. This, however, was driven by a subjective assessment across a range of criteria including technology, people, risk, process complexity and data structures, which by its nature is imprecise and subject to the knowledge/biases of the assessor.

Definition of required resources

In general, detail of resources was very weak across the submission and the NGET's capacity to deliver the changes is unclear, especially across the entire portfolio of projects.

Underlying cost models have separate lines for internal and external resourcing, hardware and software. These have been built using a top-down estimate to develop an associated allowance rather than a bottom up approach derived from a work breakdown structure.

Roles listed within resource profiles are predominately IT focussed, therefore the ability to land the projects within the business through business change does not appear to be costed. During the deep dive discussion, it was explained that such activities were covered by the "other" line within the project costings, but on occasions this would be inconsistent with explanatory notes within the cost models.

Specific items of note – "Asset registry and work management systems" acknowledges that there may be internal and external resource constraints, but the associated mitigation is weak.

Infrastructure – there is some attempt to describe resource costing for data migration however it is unclear if this is pure technical resource or includes project management/co-ordination effort as well.

Cost Categorisation

A semi-structured way of categorisation risks was presented for several projects, however there was no presentation of the cost of the proposed mitigation or the cost value of the residual risks that remained. Greater visibility of risk would allow Ofgem to understand the level of uncertainty within each project and the potential for the use of reopeners to share the level of risk.

There were slightly inconsistent methods for generating the risk budget with a value of 10% (generally) applied in different ways - in some case this was applied as an uplift to the cost build up, in others it was applied as a top slice with projects cost apportioned to the remaining budget.

A number of projects within the deep dive provision (such as Business planning, IT tooling, ng.com, platform maintenance, service now, SHE) do not contain any allocation for hardware, software or risk.

External resource rates have been benchmarked by Gartner and are regarded as very competitive. Partner rate cards appear lower than those applied to internal staff. For some projects the formulaic approach to allocation of project costs means there is significantly more internal staff used. Such projects would potentially underspend if proportion of partner resources were then increased during the actual project.

NGET supplied several Investment Decision Papers (IDP's) to support the projects for which they were requesting funding. Although informative, the IDPs generally undertook a high-level comparison between several different options before undertaking a Cost Benefit Analysis between the preferred option and a baseline variant. By not undertaking costs benefit analysis for all options there is the potential that NGET may have dismissed approaches which give slight reduced business outcomes at significantly reduced cost.

The Cost Benefits Analysis associated with each IDP presented costs at an aggregated annual level, therefore it was not possible to validate any of the costs associated with the IDPs selection of a preferred approach. There are inconsistencies between cost profiles presented in the IDPs, the NGET IT Investment Annex and IT&T Summary.xls provided (£36.65m vs £12.211m in IT&T Summary.xls for hosting, LAN spend for 2022 is £3.52m vs £1.75m). It is assumed that these inconsistencies arise from the use of analyses and documentation at different levels of maturity. The figures shown in the RAG assessment align with those in the NGET IT&T Table Summary.xlsx : Sheet "D4.3a_Non_Op_Capex".

The BSC budget per annum is in alignment with the previous spend with only a £0.2m difference between the RII0-1 and RII0-2 budget. Hence Atkins is content to recommend the acceptance of the requested Opex budget.

The NGET Opex and Non-Op Capex assessment results are summarised in Table 3-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
CAI	87.3	18.2	17.5	87.3	0.0%	
BSC	98.0	19.8	19.6	98.0	0.0%	
Non- Operations CAPEX	337.0			143.5	23.5%	149.4
Sub Total	522.4			328.9	11.8%	149.4

Table 3-2 - NGET CAPEX and OPEX figures

3.4. Conclusion

The NGET response suffers from inconsistent projects names between the different documents; therefore, it is difficult to associate clarification provided by NGET with the associated projects with absolute certainty. For example, spend profiles for sub-project (of value >£1m) is provided, but there is no explicit linkage to the summary areas of the NGET IT Investment Annex. Likewise, summaries of projects are provided which give indication of activity, outline timeframes and some risks. However, it is hard to link this back to the area listed in the NGET IT Investment Annex.

NGET has employed a methodology to estimate its future project expenditure. However, given the early stage in the project lifecycle for many of these projects they can only be regarded as broad estimates.

3.5. Recommendations

The RAG assessment of the Opex and Non-Operational Capex budgets estimated by NGET recommends that Ofgem, initially at least, provide the funding shown in Table 3-2.

Additionally, it would be prudent to consider the following strategic recommendations to support the proposed recommendations in Table 3-2.

- Detailed change management plans to be considered, showing that they have understood the wider changing demands and wider technological, social and geographical changes happening and how this supports their strategy.
- Benefits could be better defined and quantified in terms of how the individual projects will relate to and support overarching strategic objectives.
- Delivery approach and resources required to support the projects needs more information in order to provide more confidence that this is understood and will therefore not become a risk at a later point

4. NGGT

4.1. Overview

NGGT has provided significant discussion and detail for the proposed scope of RIIO-2 activities.

Refer to Appendix A for SQ's raised and received during the valuation process.

We attended two deep dives 20th February and 24th March where more context was provided by National Grid on their submissions across NGGT (GSO + GTO) and NGET.

4.2. Key Findings

Overall Business plan

NGGT has provided a high-quality business plan but their IT strategy is not immediately easy to understand. It has several themes:

- Consolidation to key platforms, applications and infrastructure services
- Building core foundations in hosting, networks, storage, communications, end-user devices and operations
- Transitioning to subscription-based models (IaaS, PaaS, SaaS)
- Optimising asset lifecycle, adopting evergreen policies
- Providing shared capabilities to support businesses across the National Grid Group (NGET, NGESO, NGGSO, NGGTO)
- Taking advantage of emergent and maturing technologies (Internet of Things, Machine Learning, Artificial Intelligence, Automation, BIM etc.)

These themes are largely heading in the same direction of a consolidated IT estate with a range of insourced and outsourced capabilities (manifesting in RIIO-2 projects such as the replacement of their Ellipse Enterprise Asset Management solution). However, in practice, there are several platforms and services that NGGT cannot transition to this model during RIIO-2 and they will need to continue to support and refresh end of life technologies (such as their GIS solution) or continue to add layers of integration and complexity (such as their Gas Connections Applications Portal). This leads to several tensions in their IT estate. While many of the end of life and highly cost inefficient technologies will be moved off in RIIO-2, the expectation is that there will be some that may need to be addressed in RIIO-3 (such as their Gemini system which is used for shipper interaction with GSO) and there will be a recurrence of a need to refresh or replace aging bespoke tools in RIIO-3 in addition to those requested in RIIO-2.

IT strategy

Of the 65 projects NGGT has identified to be undertaken during RIIO-2, 51 of their requested direct investment have been organised in relation to stakeholder priorities determined from an extensive stakeholder engagement exercise carried out 2018-2019 in the preparation of their RIIO-2 plan:

Stakeholder Priority	Number of Projects	Requested funding
I want the gas system to be safe	3	£4.5m
I want to take gas on and off the transmission system where and when I want	39	£111.7m
I want all the information I need	3	£10.5m
I want you to facilitate the whole energy system of the future – innovating to meet the challenges ahead	3	£49.9m
I want to connect to the transmission system	3	£3.6m

A detailed review of each individual project is captured in the Project RAG spreadsheet. In general, the following trends have been identified:

- The quality of the submissions is good with enough detail to understand the rationale and the options analysis;
- Roadmaps have not been provided at this stage to show the timing, but outline timelines are given for the majority to show where in the RIIO-2 period they will be delivered along with a summary portfolio view.
- Benefits are clearly identified but no modelling has been carried out to forecast what will be realised. These benefits are in line with strategy for RIIO-2;
- Most projects are focussed on moving off bespoke, customised capabilities to leverage external commodity products. There are a few examples (e.g. Gas Connections Applications Portal) where this is not the case and the risk of creating unwieldy capabilities that are costly to maintain needs to be monitored;
- There are several examples however where capabilities will continue to be shared with ESO or NGET (e.g. enTrader and their GIS solution) which presents a risk of a large investment being need in RIIO-3 to address divergence in RIIO-2 if it were to occur;
- There are several systems which are being refreshed due to their IT Asset Health Policy. The detail provided in Appendix 1 of Appendix A20.03 IT Investment Plan explains this policy is high level and does not provide enough detail to explain the rules that are used to determine if an asset is contravening this policy, it is largely summarised as being triggered when performance is insufficient or newer technology is available. In the deep dive on 20th March, we were informed that National Grid have changed the indicative timescale that is applied to determine when a refresh is needed from 8 years to 5 years. This is not stated in Appendix 1 of Appendix A20.03 IT Investment Plan but aligns with the timescales for many of the systems that have cited the policy as the reason for a refresh.

Delivery approach

NGGT has implemented several changes to their delivery approach in the run up to RIIO-2. This includes:

- Installing a central enterprise architecture function, assumed to be aiming at achieving their IT Strategy's themes in order to deliver consolidated, converged and optimised estate. In response to SQ4, NGGT has explained that this is inflight and should be implemented by the start of RIIO-2. Based on a review of the business plan submission, this will have a significant impact on the plans for RIIO-2 which may lead to some identified solutions being no longer fit for purpose and significant rework being required on this plan. This is a common impact of the installation of a central enterprise architecture function where that function may identify the use of capabilities that diverge from common platforms, lack of interoperability of systems or the use of point solutions or shadow IT in the wider estate that had not been identified via previous governance structures.
- Establishing approaches for agile and scaled agile delivery (SAFe). NGGT are planning to industrialise this approach during RIIO-2 and to enhance the revised governance model for Architecture Governance through implementing agile architecture methodologies and processes. In response to SQ4, NGGT explained that these changes have been implemented already so should be mature or maturing by the start of RIIO-2.
- A portfolio planning framework, adopting principles similar to Management of Portfolios best practice. Further detail on NGGT's portfolio planning processes was provided in response to SQ5 which shows a mature approach with clear processes, set prioritisation criteria with clear definitions for scores and a regular heartbeat of quarterly assessment. There are no plans to expand on this framework in RIIO-2 and we have had assurance that they are adept at portfolio planning, in particular at portfolio prioritisation, via the deep dive on the 20th February.

Ahead of our deep dive on the 20th February, National Grid also provided documentation laying out National Grid Group's separate Solution Delivery Framework (SDF) which is used as the end-to-end process for managing their waterfall delivery. This is a typical stage gated process for delivery with criteria that need to be met before delivery can progress to the next phase. This aligns with PRINCE2 best practice. In that material, a separate framework for managing agile projects was referenced but not shown. The assumption is that this is the other cited agile frameworks. In response to SQ4, NGGT has explained that the SDF has been specifically adapted to take account of the implementation of new architectural governance, manifesting in changes to the artefacts required to pass stage gates in the SDF.

The above frameworks and approaches combine to provide a bimodal delivery approach to delivery of their portfolio, using agile and waterfall approaches appropriate to the solution to be delivered. The expectation is that

this will optimise in RIIO-2, embedding strong technical and service transition governance to deliver high quality, supportable solutions.

All the delivery frameworks approaches described are part of NGGT's overarching framework for the financial and delivery governance of IT projects.

This standardisation of frameworks is good to see to build confidence that NGGT will be able to deliver their RIIO-2 portfolio. This would be true of any organisation but is of particular value for NGGT as, during RIIO-1, NGGT incurred an increase in cost of £55m non-operational capex on three IT initiatives (Project One; Asset Data Enhancement Programme; initiative to replace and enhance core asset management systems;), citing unforeseen needs for additional work to enhance these systems and meet their requirements. In response to SQ3, NGGT explained that a review was undertaken to identify the root causes of these issues and lessons learned, summarised as follows:

Project	Root Cause	Lessons Learned	Analysis
Project One	Following the initial release of the NGG ERP system, subsequent releases of the ERO system for non-ESO businesses were delayed due to the complexity of separation from ESO, exacerbated by the complexity and customisation of the existing SAP solution	Project One (and NGGT's RIIO-2 strategy) has adopted a principle of minimising customisations and using out of the box data models	This principle is a key one to adopt. A subsequent lesson to be learned is to forecast equal levels of complexity into any future project to separate a product shared with ESO, such as enTrader (the GSO Energy Trading, Reporting and Notifications solution) or the GSO Voice Recorder.
Asset Data Enhancement	Asset data was being captured on a site by site basis for digitisation and centralisation. As the collection progressed, the standards for collection of data changed, needing repeat visits to sites to address gaps. Further issues were related to overestimating the maturity of data, leading to extra work to capture to a sufficient standard	Ongoing processes have been implemented for the accurate capture of new and changes asset data with supporting tooling to address errors. A dedicated Data Team has been established in GT to ensure ongoing maintenance and improvements of asset records	This was a one-off project to address shortfalls in asset data maturity. These issues should be factored into the planning of any future digitisation projects to ensure the standards are set early in the process based on application and that the maturity of data is not overestimated again.
Initiative to replace and enhance core asset management systems	The complex architecture and integration of the enterprise asset management system with other systems led to multiple complexities during testing and delivery of integration, leading to delays.	NGGT will adopt a general principle of improving their architecture, simplifying integration between systems and overlapping capability. This should avoid the need for complex integrations and increasing investments in the future	This principle is a key one to adopt but it is not being applied for all systems in NGGT's RIIO-2 plans.

In addition to the above specific lessons learned, NGGT has also established a common change delivery approach and a new change structure allowing prioritisation of all change activities, including IT projects. This looks to be an adequate response to the issues experienced in RIIO-1. Additionally, NGGT explained in their response to SQ4 that there are no planned changes to their delivery framework, wider governance or IT operating model planned for RIIO-2. This means that the delivery approaches described, which are currently in place, should be able to take advantage of the stable operating environment to mature early in RIIO-2 and allow for efficient and well governed delivery of the RIIO-2 portfolio.

Workforce Resilience

National Grid advised at the deep dive on the 20th February that they have static staff numbers. A work breakdown structure has not been identified for any of the cited initiatives in the NGGT's business plan so it is unlikely that they will have a view on whether they have enough staff to deliver their portfolio. In response to SQ6 on this subject, NGGT state that forecasting of the internal and external resources is carried out regularly as part of normal operation. Specifically, for the RIIO-2 portfolio, they state that "Actions are in place, and even in the absence of a final determination, due to scale and complexity, activities are already inflight to ensure the requirement level of capability mix aligned to our forecasting activities is achieved for the RIIO-2 period." They also state definitively that they have sufficient flexibility to bring in additional resources via their ADAM framework if in scope of this framework or use alternative procurement routes. It is reassuring that NGGT has confidence that they have sufficient resources or routes to bring them in but somewhat surprising given the well-documented skills-shortages across the industry as a whole.

In terms of training, NGGT has made references throughout the plan to their need for upskilling of staff to use agile delivery approaches (including SAFe), updated end user devices, analytical and modelling services, cloud platforms; artificial intelligence; business process automation; data management; and to become multi-discipline skilled individuals. There is one specific investment related to installation of a Gas National Control Centre (GNCC) simulation environments (£0.65m Capex) and a mention of the YouConnect (Global Human Capital Management System) upgrade / refresh initiative that will review and potentially re-tender during RIIO-2 to ensure continued management of training and provision of e-learning. In response to SQ7, NGGT refer to the "various training packages associated to their RIIO-2 plans, from high level understanding of the plan, to detailed mechanisms and structures." which will be supported by the YouConnect system. Given the number of changes to delivery frameworks and governance and the focus on novel technologies during RIIO-2, you would expect that training would be a key element of their plan to prepare for RIIO-2 so it is reassuring that there are plans around training. However, it is concerning that the emphasis on training to address the required workforce impacts of their portfolio is absent from the details of the rest of the IT + T delivery plans. This potentially shows a disconnect between the technical changes and the required people changes to make use of them.

Approach to change management

Change management is a key element of NGGT's change delivery framework which on paper looks to be a viable approach that consists of capturing the business change strategy, stakeholder mapping, change impact assessment, business readiness assessment, delivery of the change plan and ongoing senior stakeholder engagement. This level of quality will be needed to ensure successful delivery in RIIO-2.

NGGT has identified poorly managed business change as a key risk to delivery of their RIIO-2 portfolio and have proposed to monitor the impact of the delivery on the business as a mitigation, with awareness for signs of change fatigue. This is a risky approach and should only be adopted if all proactive approaches have been carried out already to mitigate the risk, such as spacing of implementation of changes hitting the same stakeholders, extensive engagement and cocreation with users prior to changes to soften the impact and bolstered business change activities pre and post implementation as hands-on support to mitigate the levels of disruption.

Risks

NGGT cite three key risks to achieving their IT Strategy (1-3) and three further key risks to achieving their IT Investment Plan (4-6):

ID	Description	Mitigation	Analysis
1	Cost Saving Targets are not achieved	Deep dive sessions are ongoing to discuss options	This mitigation is still to be determined through the deep dive process, but there is a general lack of detail in relation to how efficiencies or benefits will be realised so low confidence that this mitigation will be enough to address this key risk. SQ5 asked for more detail on their approach to benefits management but this was not covered.
2	IT do not have the capacity to deliver	Optimise use of insourced capabilities and supply chain to manage demand	This is a common and ongoing risk with cited business processes to address so reasonable confidence in this mitigation as they are not specific to NGGT or to RIIO-2.

ID	Description	Mitigation	Analysis
3	The business does not have the capacity to deliver	Monitor impact on the business;	As mentioned above, this is an insufficient mitigation as the proactive mitigations to avoid change fatigue or lack of change acceptance by the business have not been cited.
4	Technology changes during RIIO-2 period	Continue to reassess available technologies and adjust IT investments were required	This is a common and ongoing risk with cited business processes to address so reasonable confidence in this mitigation as they are not specific to NGGT or to RIIO-2.
5	Regulatory changes above and beyond normal levels experienced in RIIO-1; mitigation	Continue to monitor risk and assess impact	This is out of NGGT's hands hence the passive mitigation cited. This is reasonable and will rely on continued dialogue with Ofgem which is clearly occurring at present so have high confidence that these risks will be avoided or mitigated as effectively as possible.
6	Investment Plan and Delivery is not fully financed across NGG and NGET, leading to increased costs;	No mitigation cited	No mitigation provided but as with 5 this is out of NGGT's hands and will rely on continued dialogue with Ofgem which is clearly occurring at present so have high confidence that these risks will be avoided or mitigated as effectively as possible.

This is a good identification of the likely risks that will impact on delivery of the RIIO-2 IT+T investments, with cyber risks also frequently cited throughout the documentation but out of scope of this assessment.

4.3. Cost Analysis - Key Findings

NGGT is requesting £251.6m in IT+T investments. This consists of:

- £161.4m for the Gas System Operator business;
- £90.2m for the Gas Transmission Owner business.

65 distinct IT & Telecommunications projects have been defined through a number of IT investment strategy documents and CBAs and proposed by NGGT for investment during RIIO-2. It should be noted that the BPDT presents considerably less project level granularity than the Business Plan IT Investment Annex and the engineering justification papers.

A review and cost assessment of each project was carried out and the resultant RAG scores are shown in Table 4-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
GT 011 - Geospatial Information Systems Tech Health	Green	Amber	Red	Amber
GT 013 - Improve Asset Protection Service	Green	Amber	Red	Amber
GT 041 - Surveillance Reporting for Pipelines Tech Health	Amber	Amber	Red	Amber
GSO 005 - GSO GCS Refresh - Oracle & SOA	Green	Green	Red	Amber
GSO 007 - GSO GCS Refresh - Talend	Amber	Amber	Red	Amber
GSO 015 - GSO GCS Refresh - Data Historian	Amber	Amber	Red	Amber
GSO 018 - GSO GCS Refresh - SCADA	Green	Red	Red	Amber
GSO 020 - GSO GCS Refresh - Simone Online	Green	Red	Red	Amber
GSO 032 - GSO GCS Refresh - Tableau	Amber	Red	Amber	Amber
GSO 036 - GSO GCS Refresh - Forecaster	Amber	Red	Amber	Amber
GSO 011 - GSO Operational Safety & Compliance - Continual Improvements	Green	Amber	Amber	Amber
GSO 100 - GSO Cyber Compliance	Green	Green	Amber	Amber
GT 022 - Network Analysis and Design Tech Health	Green	Amber	Red	Amber
GSO 031 - GSO Data & Insights Platform	Green	Amber	Amber	Amber
GSO 101 - GSO Analytics Services	Green	Amber	Red	Amber
GSO 024 - GSO Modelling Services	Green	Green	Green	Amber

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
GSO 037 - GSO Simone Offline Refresh	Green	Red	Red	Amber
GT 017 - Insights Tech Health	Green	Red	Red	Amber
GT 019 - Data Science Tools Tech Health	Green	Red	Red	Amber
GT 020 - Establish Master Data Management	Green	Red	Red	Amber
GT 016 - Establish Innovation Platform & Capability	Green	Red	Amber	Amber
GT 030 - Cognitive Technologies to support Business Processes, Work, Asset and Corrosion Management	Green	Amber	Amber	Amber
GT 006 - Enterprise Asset Management Tech Health	Green	Amber	Amber	Amber
GT 007 - Work Management Systems Tech Health	Green	Red	Red	Amber
GT 059 - GT Specific Field Force Device Tech Health	Green	Red	Red	Amber
GT 005 - OT/Cyber Asset Database	Green	Red	Red	Amber
GT 040 - Asset Performance Management Tech Health	Green	Red	Amber	Amber
GT 039 - Data Sources (IT/OT) to Support Insights and Asset Performance Management	Amber	Amber	Red	Amber
GT 034 - Asset Investment Planning Tech Health	Amber	Red	Amber	Amber
GT 036 - Integrated process / solution for risk & reliability centred asset management (EAM, AIP, APM) [Capex]	Green	Amber	Red	Amber
GT 009 - Enterprise Content Management Tech Health	Amber	Red	Amber	Amber

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
GT 010 - Business Critical Data and Document Tech Health	Amber	Red	Red	Amber
GT 053 - Enhance Asset Design to improve management process for operation & control	Green	Red	Red	Red
GT 046 - Implement a Digital Experience Platform	Green	Red	Amber	Amber
GSO 003 - GSO CNI Gateway refresh	Green	Amber	Red	Amber
GSO 012 - GSO Data Transfer Rationalisation and Refresh	Green	Green	Red	Amber
GSO 019 - GSO Control Room Display Refresh	Green	Green	Red	Amber
GSO 021 - GSO Control Telephony Refresh	Green	Amber	Red	Amber
GSO 022 - GSO Voice Recorder Refresh	Green	Red	Red	Amber
GSO 023 - GSO Telemetry Network Refresh	Green	Amber	Red	Amber
GT 042 - CIS Tech Health	Amber	Red	Red	Amber
GSO 102 - GSO GNCC Simulation Training	Green	Amber	Amber	Red
GSO 001 - GSO New Information Provision	Green	Red	Red	Amber
GSO 025 - GSO MIPI Refresh	Green	Amber	Red	Amber
GSO 028 - GSO Energy Trading, Reporting and Notifications refresh	Green	Amber	Red	Amber
Gemini Replatforming	Amber	Amber	Red	Amber
Regulatory Driven Gemini System Enhancements (GB&EU)	Green	Amber	Red	Red

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
GSO 027 - GSO Regulatory and Market Driven Changes - Non-Gemini	Green	Amber	Red	Amber
GSO 013 - GSO CRM Developments	Green	Red	Red	Amber
GSO 030 - GSO Customer Connections	Green	Red	Amber	Amber
GT 002 - Customer & Stakeholder Tools Tech Health	Green	Red	Amber	Amber
Project One	Red	Red	Red	Red
Infrastructure for CNI systems	Red	Red	Red	Red
Hosting	Red	Red	Red	Red
LAN infrastructure	Red	Red	Red	Red
WAN infrastructure	Red	Red	Red	Red
Modern Workplace - End User Compute	Red	Red	Red	Red
NOC	Red	Red	Red	Red
Data Management / Archiving - Tool/Licensing/Implementation	Red	Red	Red	Red
Digital IT Operations	Red	Red	Red	Red
Service Now upgrade and Capability improvements	Red	Red	Red	Red
SuccessFactors (MyHub) Upgrade and Enhancements	Red	Red	Red	Red

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Infrastructure	Red	Red	Red	Red
Business Services	Red	Red	Red	Red
Policy Projects / Other	Red	Red	Red	Red
Other IT Expenditure - excluding assessed Projects <£1m - total £6.55m	Red	Red	Red	Red

Table 4-1 - NGGT Project RAG Assessments

Note that a set of NGGT projects has not been assessed due to an absence of supporting documentation and inconsistencies in the quantitative data. In Table 4-1 these projects start with and are below the entry for 'Project One'.

Generally, the NGGT project descriptions demonstrate good justification for project investment and the CBAs establish traceability in the cost build-up. However, in many cases the descriptions provide insufficient detail to clearly define the project scope, timescales and dependencies. Resourcing requirements and risks were also poorly defined. This difference in quality of provided information is reflected in the RAG scores with 'Project definition including timing, scale & dependencies' and 'Definition of required resources' predominantly Red or Amber whereas the 'Cost Assurity' and 'Project Justification' categories are mostly Green. SQ's were raised to address any gaps in the data, however the information received was still inadequate. This was attempted to be addressed further at the deep dive session on the 29th February 2020.

Several NGGT projects were particularly poorly supported in the documentation. An example of this is 'GT 053 - Enhance Asset Design to improve management process for operation & control' which puts forward a good project investment justification case but does not provide any traceable cost build up to the £1.6m cost estimate, no benchmarking of the estimate, no detail about the required resources, no potential timeline or mention of risks and mitigations. If possible, more information should be requested about the project plans and the resources required to deliver the project.

Project 'GT 010 - Business Critical Data and Document Tech Health' also has a poor set of RAG scores. The management of structured and unstructured content is not critical to business function and so the project is not considered well justified. In addition to this the £1.1m cost estimate falls well outside of the Gartner benchmark range creating cost uncertainty. Little information was provided about the definition and scope of the project or its required resources.

The 'Regulatory Driven Gemini System Enhancements (GB&EU)' project is another with a poor set of RAG scores. The project is driven by regulation, focusing on "market compliance with EU legislation" making the project clearly justifiable. Significant changes are expected in the legislation and therefore a large cost estimate has been assigned to the project but there are currently no details on what these changes will be. As a result, the poor project RAG scores reflect the lack of clarity on project definition and cost assurity. Although this project has one of the poorest set of scores it is as well defined as can be expected given the lack of information available to NGGT on the legislation.

The requested IT investment budget for CAI per annum sits at £12.7m, an increase in £2.5m from the RIIO-1 requested BaU annual spend. The BSC requested budget per annum has also increased by £2.2m from £12.2m in RIIO-1 to £14.4m.

The results of the RAG assessment are summarised in Table 4-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
CAI	97.6	11.4	19.5	95.6	2.1%	
BSC	107.9	18.8	21.6	107.2	0.7%	
Non-Operations CAPEX	251.6			34.9	19.8%	208.2
Sub Total	457.1			237.6	4.5%	208.2

Table 4-2 – NGGT CAPEX and OPEX figures

4.4. Conclusion

In summary, the NGGT RIIO-2 business plan has objectives that are in line with industry best practice and Ofgem's own objectives. However, their ability to deliver against these objectives in full is impeded by their historical reliance and entanglement with other areas of the NG group for provision of COTS or bespoke tools. This leads to a mixed portfolio of projects to re-platform to viable, future-proofed subscription-based services of COTS technologies, to extend and refresh bespoke and/or shared capabilities and extend aging capabilities, a trend that is likely to continue into RIIO-3 and potentially beyond. This raises key questions about the most efficient and most cost-effective means to address these inefficiencies, i.e. to address now or in RIIO-3. Beyond the questions around strategic direction, the evidence provided around their delivery approaches is good and in particular the changes they have made to address issues encountered in RIIO-1. These changes to delivery approaches should be in place and mature or maturing by the start of RIIO-2 so there is a good level of confidence that they can deliver their requested portfolio. However, there is a concern on the lack of information to support the Project definition including timing, scale & dependencies' and the definition of required resources to support the projects, which will impact the recommended funding allowance.

4.5. Recommendations

The recommended investment spend for the is shown in Table 4-2.

Additionally, it would be prudent to consider the following strategic recommendations to support the proposed cost reduction recommendations in 4.2.

- Request a summary of the deep dives that are determining the mitigation for the cited risk around Cost saving targets not being achieved. This should be scrutinised to assess the confidence that any forecast saving will be managed to realisation and identify the impact of failure.
- Monitor for signs of delivery issues during RIIO-2 (due to change fatigue, lack of capable change management or misaligned portfolio delivery) and restrict funding to initiatives that experience difficulties until they have been mitigated to guard against high levels of sunk costs in failed programmes removing the option of changing the scope or direction of an initiative.
- Request findings of any enterprise architecture review, identifying any solutions that are highly bespoke or built internally and/or any capabilities that will be end of life in RIIO-3. This should be analysed to identify if any of these are being simply maintained or refreshed during RIIO-2. This analysis should determine whether any additional funding should be provided to move off these capabilities in RIIO-2 and realise the benefits of a fully supported commercial equivalents from RIIO-2 onwards. The disruption to the business that would be caused by changing these capabilities along with others already planned for RIIO-2 should be assessed as part of this analysis.

5. SPT

5.1. Overview

SPT demonstrates a good understanding of the need for change, what change is required, the benefits this will generate and how its proposed changes will deliver its strategic objectives. In most parts it has provided a reasonable strategic justification and is well on its way to delivering its stated intentions and strategy. SPT states: 'We will take the lead to build a healthier, more accessible energy model – one which leaves the carbon economy behind' and 'We will meet carbon targets, customers' low-carbon ambitions, and make a large, proactive contribution towards Net-Zero... *With smarter solutions, we can do more with less* – deploying new technology, processes and ways to share data."

Refer to Appendix A for SQ's raised and received during the valuation process.

5.2. Key Findings

Overall Business plan

SPT is notable in its detailed submission, in its mature approach to risk identification and assessment and crucially, in its recognition of the need to do things differently in order to deliver the legislation in the required timescales. It aims to deliver its programme of change at an average cost to customers of £4.43 per annum, which technology is a key enabler to driving these efficiencies.

It allows £40.8m for Resilience and a separate £21.1m net zero fund over and above the funds allocated to other areas of change. SPT has a mature approach to identifying and managing uncertainty and has provided high level project plans that clearly indicate the interdependencies and timescales of its proposed projects to deliver.

All its IT managed security plan projects have undergone a risk assessment which are reviewed and updated on a monthly basis across a wide range of identifiers/parameters, enabling a rapid/timely response to change.

The company recognises the need for a changed workforce to deliver to the 2035 & 2050 legislative changes. It has significantly invested in its workforce, in particular the IT security team, and aims to triple in size its wider IT transformation team. The company now has a permanent team that has a range of skillsets from trainee to fully trained staff and is less reliant on contractor staff.

From its business plan and detailed responses to SQ, this company provides confidence in its ability to deliver and to adapt if necessary, to uncertainty.

IT strategy

The company has an annual budget of c.£1.7M which includes hardware and software refresh. The total cost of the annual IT Security Plan budget apportioned to Scottish Power Transmission PLC is therefore £340k per annum.

- The key drivers for change will be the transition to net Zero, increasing digitalisation of processes and data analytics.
- The company's approach to data interoperability is mature though is reliant on proprietary software for its stated reasons.
- Digitisation will enable energy demand to become increasingly responsive to changes in the prices of these services and to participate actively in their provision. Digitalisation will enable the networks to become more actively managed, potentially ending the passive network management paradigm, in which networks are sized to meet the aggregate peak demand of passive consumers. The IT plan focuses on enabling efficient management and operation of the transmission network. Costs include for ongoing costs and for future growth.
- Forecast costs have been independently assessed by Gartner. Some areas of spend are slightly higher than industry expected but given the uncertain nature surrounding this spend, these are not unreasonably high.
- It has a clear understanding of how access to improved accurate and timely data can impact the business – changing practice, becoming more responsive to change, more effective and efficient and delivering better value to its consumers.

- SPT has an understanding that technology such as: mobile devices, big data, the internet of things, cloud computing, edge computing, robotics, and virtual reality, affects all areas of daily life, in the home, in companies, across the economy and society.
- Integral to its future are further digitisation technologies such as machine learning, artificial intelligence and digital analytics to create an intelligent network management and operation organisation. It aims to do more with less.

The direct connection of this increased use of technologies to achieving net zero carbon remains unclear. Though it is aware of the need to detail this connection and has provided evidence it is taking steps to record these connections for example, through the deployment of a waste solution to capture information about waste generated and its eventual disposal and the deployment of IT solutions to capture information about emissions including carbon emissions.

A detailed review of each individual project is captured in the Cost Analysis workbook. In general, the following trends have been identified:

- The quality of the submissions is excellent with enough detail to understand the strategic rationale for the projects and the options analysis. They demonstrate an excellent understanding of the need for change, what change is required, the benefits this will generate and how its proposed changes will deliver its strategic objectives.
- SPT adopts impact and benefit assessment across all projects funded by innovation stimulus allowing benchmarking data to be presented to stakeholders in a unified manner and enables Ofgem to assess and publish the benefits generated through the innovation stimuli in RIIO-T2. This unified benefits forecasting, tracking and reporting methodology will create transparency of the use of innovation funding by network licensees in RIIO-T2.
- Roadmaps have not been provided at this stage to show the timing, but outline timelines are given for the majority to show where in the RIIO-2 period they will be delivered along with a summary portfolio view.
- The majority of projects are focussed on consolidation of IT solutions around key asset management platforms, moving to cloud base solutions to enhance data capture and new digital technology such as robotics processes to drive automation.

Delivery approach

SPT has given considerable consideration to its delivery plan which includes extensive stakeholder consultation, including with trade unions and suppliers, to ensure it considers all critical aspects and has embedded key stakeholder feedback and priorities in its delivery. It has developed an overall delivery framework that can ensure its digital strategy remains fit for a changing future. It has established protocols to ensure continuous review and refresh of its strategy throughout the RIIO-2 period, which includes the need to adapt its plans following stakeholder feedback. Additionally, the company proposes to establish a Net Zero fund, which aims to facilitate low carbon initiatives, with a specific focus on communities in vulnerable circumstances.

The company has clear objectives, identified benefits a timescale to deliver. It has provided detailed rationale for its proposed projects and high-level project plans that identify key dependencies and decision points. It has provided a detailed response including narrative to explain the largely stand-alone nature of these intended projects and has ranked their projects in order of priority and need.

Workforce Resilience

The overall costs to transform the workforce through training and change management appears to be insufficient. The workforce needs to be resilient and equipped for the envisaged increased digitised future and should be considered further as part of the cost analysis. SPT recognise that a workforce with the right skills is essential. They state that they undertake continuous reviews of their resourcing plans. There is acknowledgement of the skills shortage facing the industry against a challenging background of maintaining existing skills and the requirement for new technology. Their review process has highlighted that many of their staff are due to retire during the next control period making it clear that they need to recruit and train new staff. Additionally, they recognise that partnerships will create benefits such as sharing best practices and also upskilling their staff and this is part of their workforce strategy. However, it is not evident from the proposal how the workforce is embedded into projects and furthermore where new skills are required to support the IT projects.

However, SPT business plan does provide confidence that they understand change management and delivery and therefore we have not reduced our strategy scoring based on this.

Risks

SPT has identified and provided clear risk mitigations for each of their projects. Their business plan evidence that they understand the need to change and how they will change, which is supported by their approach to identifying and managing risks. Furthermore, SPT has considered the wider external strategic drivers, which may impact their strategy in the future, in particular around Brexit.

- SPT has assessed the risks associated with Brexit and has put in place appropriate measures to mitigate these risks. There have been no specific risks identified in relation to IT Security. All existing controls in place in the global Iberdrola group continue to meet the needs of SPT.
- This provides a degree of confidence that the company has considered the risk posed by Brexit and will continue to monitor and review the situation.

SPT recognise that there are some areas within their plan that are less certain. This maybe a result of legislative changes or new contractual requirements from network customers or due to project needs and costs being unclear. In RIIO 1 – a number of uncertainty mechanisms were used to adjust their allowed revenues. In the same vain, SPT are proposing similar measures for RIIO-2, which shows a level of maturity in their thinking and approach to uncertainty. These measures consist of;

- Volume drivers – calibrated at the start of the price control, these automatically adjust their recovered revenue.
- Reopeners – these are forward looking revenue adjustments. Triggered by a threshold being reached.
- Unit cost allowance – a schedule of efficient unit costs is agreed with Ofgem at the start of the price review for predefined activities to address uncertainty.
- Pass through items – SOT occur costs that would be assessed by Ofgem after the event once data on actual expenditure is available.
- Indexation – where costs are tracked utilising recognises indices. Allowances are adjusted accordingly.

A similar approach to manage the uncertainty of the costs and risks within the IT investment projects should be considered.

5.3. Cost Analysis - Key Findings

There are 15 IT related projects proposed by SPT for investment. The RIIO-2 Business Plan and supplementary question response provide a comprehensive description of these projects which have been aligned with the four strategic themes for consistency purposes. Each project was evaluated and the RAG scores are listed in Table 5-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

The project evaluation results indicate a clear pattern in the information provided by SPT, reasonable justification cases for project investment but very little project planning, resourcing or cost assurity details. The poor RAG scores result in SPT having a relatively low aggregated composite RAG score.

Among these projects the Asset Condition Based Decision Support stands out as being poorly supported. Although the project description demonstrates reasonable justification and cost estimate transparency, there is no roadmap or resourcing information provided.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Digitisation of land & planning data	Green	Amber	Red	Amber
Black Start	Green	Amber	Red	Amber
Asset Information Management	Green	Amber	Red	Amber
Power Systems Analysis Software	Green	Green	Amber	Amber
Big Data, 3D Modelling/visualisation, Analytics	Amber	Amber	Red	Amber
Digital Sub-station	Amber	Amber	Red	Amber
Environmental & Sustainability	Amber	Amber	Red	Amber
System Monitoring & Dynamic Rating	Green	Amber	Red	Amber
Stakeholder Solutions	Green	Amber	Red	Amber
IT communications network upgrades	Green	Amber	Red	Amber
BIM Integrated Solutions	Green	Amber	Red	Amber
Asset Condition Based Decision Support	Amber	Red	Red	Amber
Other IT Projects not identified	Green	Green	Green	Green
Network Asset Design Tool	Red	Amber	Amber	Amber
Application product upgrade	Amber	Amber	Amber	Amber
Infrastructure upgrades	Amber	Amber	Amber	Amber

Table 5-1 - SPT Project RAG Assessments

The BSC budget per annum is in general alignment with the previous spend with only a £0.1m difference between the RIIO-1 and RIIO-2 budget.

The results of the RAG assessment are summarised in Table 5-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
BSC	24.8	4.9	5.0	24.7	0.6%	
Non-Operations CAPEX	12.0			1.6	18.2%	10.0
Sub Total	36.9			26.3	1.9%	10.0

Table 5-2 – SPT CAPEX and OPEX figures

5.4. Conclusion

Overall, SPT has provided a detailed quality submission that clearly shows alignment between IT Strategy, business strategy and the benefits they intend to realise. They have a mature approach to risk identification, mitigation and management and this is evident throughout their proposal. However, whilst the strategic rationale is clearly understood, the project details including resources required for delivering projects, project timescales and cost build-up are not described as well and this is reflected in the proposed recommended reductions in funding provision. The poor aggregated composite RAG score has a substantial impact with the CAPEX requested budget falling from £12.0m to a recommended allowed ex-ante allowance of £1.6m, representing a recommended funding reduction of 86.4%. The overall recommended funding reduction is 28.6% as noted in Table 5-2.

5.5. Recommendations

It would be prudent for Ofgem to consider the following strategic recommendations to support the proposed reductions in Table 5-2.

- Request additional information on workforce resilience to ensure there is no risk to delivery and therefore impacting overall costs and project timing
- Request roadmaps for each project showing timescales and any interdependencies between projects.

6. SHETL

6.1. Overview

SHETL states: we will “*deliver value for electricity customers, society and shareholders by developing, owning and operating the transmission network in a safe reliable and sustainable way*”. The company provides electricity to 3.7 million homes and businesses in Scotland and Central Southern England. As part of their investment evaluation SHETL state that their “business plan and overall Digital Strategy has been and will continue to be, informed by outputs from the Ofgem and BEIS jointly commissioned Energy Data Task Force, which published its report, A Strategy for a Modern Digitalised Energy System, in July 2019.

Refer to Appendix A for SQ’s raised and received during the valuation process.

6.2. Key Findings

Overall Business plan

SHETL has provided a high-quality business plan with a clear explanation of the strategic need for, and benefits of, each project. The plan follows current industry trends and addresses perceived shortfalls when reviewed in the current climate of technological change.

SHETL has four strategic drivers that are clearly defined and easily understood:

- Safe and Secure Network Operation – Use data efficiently to understand, predict and get the best network performance.
- Sector-leading Efficiency – Integrated approach to whole life development and operation, using risk-based engineering to deliver value.
- Stakeholder-led strategy – Taking a whole system approach to network operation development to meet current and future customer needs.
- Leadership in Sustainability – Trusted partner of customers and communities, realising long term benefit for society, the economy and the environment.

IT strategy

“*SHE Transmission has committed in their Digital Strategy to become a more fully digitalised business, reflected in integrated data, systems, processes and ways of working, which will support and enable delivery of their strategic objectives*”. The above quote, which is taken from their business plan demonstrates SHETL’s overall attitude to their IT projects in RIIO-T2. As well as their IT strategy aligning to the requirements of the EDTF, through the documentation SHETL provide, it is clear that their IT projects supports their own overarching IT strategy.

The company made moves towards digitisation in RIIO-T1 and the strategy for T2 is to continue this digitisation in order to improve asset management performance and diversify the means by which they operate. However, SHETL’s strategic focus for digitisation in RIIO-T2 will revolve around a ‘whole system design approach’ with ‘data driven network development’ as this was a key requirement put forward by stakeholders.

SHETL has classified their IT projects for RIIO-T2 as either enablers or providers. Providers are the platforms that SHETL state will deliver tangible benefits, whereas enablers are the necessary tools and functions to support those providers. However, despite this discrepancy between projects, SHETL make clear that the planned improvements in RIIO-T2 are an evolution on their RIIO-T1 investments and they point towards 4 streams of projects:

- Stakeholders including Customer Connections
- Assets, which will both enable efficiencies and provide core information requested by stakeholders
- Work Management
- Operational Technology Control Systems

Below are listed some key themes of SHETL’s strategy that illustrate the strength of their proposal:

Project alignment with EDTF's requirement to maximise the value of data to digitise energy system

This is shown most evidently in the Data Enrichment and analytics project as well as the MDM and Data Lake projects. In line with their Digital Strategy and the Energy Data Task Force recommendations, these projects address gaps related to EDTF Recommendation 2: Maximising the Value of Data. Specifically, their planned use of AI will enhance their Data and Analytics capabilities, in order to validate and enrich data, and maximise opportunities from data sets.

Stakeholder-focused projects

The connections case management project directly benefits the IT strategy as it is technologically designed to generate tailored customer services and products for SHETL's existing and future customers. Following implementation of CMC in RIIO-T2 the connections processes will provide customers with full transparency over the process, as well as more ability to manage the process themselves through heightened engagement with SHETL.

Increasing efficiency and resilience whilst reducing costs for customers

The BIM project aligns with the overall IT strategy as it will deliver reliability, resilience and sustainability for the network. Currently, SHETL incur a significant cost within the pre-construction phases of projects. With the adoption of BIM working practices and using 3D and virtual technologies will enable SHETL to reduce costs in the pre-construction phase as well as drive efficiency through the entire capital delivery process.

Interdependency of projects all working to the overall strategy

SHETL's projects are co-dependent and work in tandem to deliver overall strategic benefit. One example of this can be seen through in interdependency of the Data Enrichment and Analytics project building on the benefits provided by the MDM and Data Lake project to give a greater understanding of how groups of assets are performing, both in near real time and over periods. Each of these three projects provide some value in themselves, however SHETL make clear that the real value is when new platforms interact with each other to deliver on their cloud based, whole system network development strategy.

Full detail of each project assessment can be found in the cost assessment in appendix B

Delivery approach

SHETL's delivery plan is set out to include constant review of data reliability to ensure success. The MDM and data lake project affect the success of many other projects that involve data collection. As part this flagship project, data from the various sources currently used by the company will be reviewed using geo-analytic and similar tools. Review of data in this way will enable SHETL to provide an initial ranking of the data that is being collected for various projects. An accuracy and completeness, ranking will be assigned to the data using a risk matrix as well as impact and probability metrics. Critical data with a poor ranking will be checked, in many cases via survey, and corrected where necessary. Less critical data will be checked as part of the regular surveys of assets. All improvements will be fed into the improved asset data systems and integration used to ensure any data shared is consistent. As well as this, SHETL's delivery plan is based on using the most appropriate technology, both making use of tools successfully deployed by similar organisations and using the latest technology where that is beneficial. SHETL also points out that their delivery strategy acknowledges the rapid development of technology, and in order to manage this uncertain landscape they will review their delivery plans throughout the RIIO-T2 period and update them as and when new technology provides better solutions.

6.3. Cost Analysis - Key Findings

Each project was reviewed using a "bottom up" approach, assessing the quality of the project description across the RAG categories. The results are shown in Table 6-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Connections Case Management	Green	Green	Amber	Amber
Transmission Universal Information	Green	Green	Amber	Amber
Master Data Management and Data Lake	Green	Green	Amber	Amber
Data Enrichment and Analytics	Green	Green	Amber	Amber
Smart Monitoring Integration	Green	Green	Amber	Amber
Linear Assets - Underground and Subsea Cables	Green	Green	Amber	Amber
BIM	Green	Green	Amber	Amber
Enabling Technologies	Amber	Green	Amber	Amber
Investment Optimisation	Green	Green	Amber	Amber
Total Work Management	Green	Green	Amber	Amber
Inventory Management System	Green	Green	Amber	Amber
Environmental Management Solution	Green	Green	Amber	Amber
Deployment of new DR Site (Inverness)	Green	Green	Amber	Amber
Other IT Expenditure	Green	Green	Green	Green

Table 6-1 - SHETL Project RAG Assessments

Good information was provided around the project context and desired outcomes. The IT Investment Plan gave good indication of the different projects and the high-level lifecycle (i.e. Design, Development, Testing) activities to be undertaken. Resourcing and cost estimates for all the named projects were provided in the "T2BP-EST-0061 IT Investment Plan (Non-Op Capex) Cost Estimate" workbook. It was not possible to align the costs in this file with those in the BPDT, but this is assumed to be due to data maturing as submission dates approached.

The potential risks were also discussed and potential mitigations along with post mitigation impact and likelihood, however no attempt to provide associated risks costs were provided. The investment cases were generally well justified.

The CAI requested budget for RIIO-2 is £10.8m which calculates to £2.2m per annum, a £0.6m increase on the previous spend. Similarly, the requested BSC per annum is £2.5m greater than the previous spend at £6.7m. The requested CAPEX budget is £41.7m.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
CAI	10.8	1.6	2.2	10.7	1.4%	
BSC	33.7	4.2	6.7	33.1	1.9%	
Non- Operations CAPEX	41.7			34.2	17.9%	0.0
Sub Total	86.2			78.0	9.6%	0.0

Table 6-2 - SHETL CAPEX and OPEX figures

6.4. Conclusion

SHETL provide a high-quality business plan with a reasonable funding request based on strategic alignment to the EDTF as well as their own IT strategy. SHETL's proposed projects for RIIO-T2 are clearly stated to be building on projects from the previous investment cycle or filling gaps in their current digital capability. None of them are deemed to be 'nice-to-haves'. SHETL's proposal for RIIO-T2 focuses on developing benefits for stakeholders, creating more robust assets, improving work management and making better use of operational technology control systems. SHETL's entire strategy is underpinned by the need to use data more effectively and conforms with the EDTF's fundamental recommendations. The weaknesses of SHETL's business plan is in its failure to provide enough information regarding project delivery, risk mitigation or change management. SHETL's projects are supported by a sound, verifiable bottom-up cost estimation facility, which means that cost estimates could be validated. When applying the aggregated composite RAG factor to the requested budget there is a recommended funding reduction across the OPEX and CAPEX categories that equates to an overall funding reduction of 6.8%.

6.5. Recommendations

It would be prudent for Ofgem to consider the following strategic recommendations to support the proposed reductions in Table 6-2.

- Continue to monitor project alignment to EDTF throughout the investment period.
- Request further understanding on risk mitigation to ensure successful project delivery throughout the investment period.
- Ensure priority of investment for MDM & Data Lake as well as Data Enrichment and Analytics as these are the most important IT projects to SHETL's digital strategy in RIIO-T2.

7. SGN

7.1. Overview

Scotia Gas Network (SGN) provides energy to 14 million homes across the whole of Scotland, South London and the South East of England. The company is asking for £62.8 million in funding for the IT enabling outputs it puts forward in its business plan, all of which align with the recommendations of the Energy Data Task Force.

Refer to Appendix A for SQ's raised and received during the valuation process.

7.2. Key Findings

Overall Business plan

SGN's IT strategy is a cloud first, build not buy approach that revolves around a commitment to becoming carbon net zero as well as delivering a high-level service at a low cost for customers.

The key objectives of the IT strategy are:

- Assist delivery of the Energy Data Task Force (EDTF) recommendations.
- Improve, open and standardise energy data.
- Greater collaboration between networks, systems and stakeholders.
- Develop a whole system approach.

The stated benefits of the IT strategy are:

- Reduction of costs for customers by 10% in Scotland and 6% in Southern.
- Increased visibility of the network for customers.
- A safer network for stakeholders.
- Maintaining an effective network.
- Better defence against cyber-attack.
- Helping the UK economy.

IT strategy

SGN refer to 4 projects that deliver an IT enabling output across their three themes. They are:

1. Membership of the Data Communications Community (DCC) – Through this project, SGN aim to attain membership of an energy community that works towards monitoring energy usage through smart meters. SGN point out that this requirement has been highlighted as an expectation on them as part of their feedback process on their business plans. It is the view of this review that the implementation of this project in RIIO-T2 is justified and coherent with their strategy as it seeks to enable wider collaboration with the industry for the benefit of customers, particularly the reduction of bills.
2. Technology Readiness – Through this project, SGN aim to ensure the readiness of new digital technologies, namely Industrial Internet of Things (IIoT) and Analytics including Artificial Intelligence (AI) and Machine Learning (ML) – SGN will install the most up to date technologies enabling them to monitor the network in the most efficient way, thereby ensuring a safe network and one that moves towards its commitment of cost effective decarbonisation. It is the view of this review that the implementation of this project in RIIO-T2 is justified and coherent with their strategy.
3. Open Data – This project is designed to enable SGN to share and receive data with other entities for the benefit of stakeholders, such as sharing roadworks information with TFL. This project is supported by the DCC project and is in line with the requirements of the EDTF. The implementation of this project in RIIO-T2 is justified and coherent with their strategy because it will enable wider collaboration not only with the energy industry but cross sector to improve customer experience and have a positive impact on the wider economy.
4. Cyber Resilience – This project is born out of necessity to ensure the company and the network are protected from harmful cyber-attacks and therefore, the implementation of this project in RIIO-2 is justified and coherent with their strategy. Cyber resilience is one of the most pressing issues of the 21st Century and in order to keep the network and their customers safe SGN need to ensure cyber resilience. It is now

a strict requirement of Government that companies (especially ones delivering an essential public service) conform with cyber regulations – this project enables SGN to do that.

Delivery approach

SGN satisfy the review's confidence in their ability to deliver all proposed IT projects in the stated timeframes. Below are listed some key takeaways from their stated delivery approach with examples from project EJP's.

Successful delivery in GD1 with confidence provided to the review that this will continue throughout GD2.

In GD1 SGN delivered successful IIoT projects that saw the inclusion of Advanced Gas Detection, Remote Pressure Control and Management, Remote Site Monitoring, Automated Pressure Tester and Osprey Pressure Validator. The success of these projects which have informed many of the projects leading into the next investment period give the review confidence that successful delivery will continue. As an example, SGN are using Smart Monitoring Key Infrastructure (SMKI) to enable the seamless transition in the Data Communications Community (DCC) – SMKI being something that SGN has significant success in deploying throughout GD1.

A well thought out investment deployment plan is considered for each project across the timeframe (even pacing deployment).

SGN suggest even pacing deployment in each project whereby they keep the investments steadily low across the first three years to allow for pivoting where necessary. In the final 2 years of the timeframe investment levels will be increased significantly to maximise impact of delivery.

Investment in new skills to maximise the success of investment in new technologies.

In order to deliver new technological projects, investment in Analytics and AI will include procurement of project managers and technology skill hiring consisting of internal staff, contractors and specialists to deliver the business outcomes.

As well as this, SGN consider various investment options for each project, highlighting the recommended option with enough clarity and justification. As a result of this, we do not foresee a need to make alternative recommendations. SGN plan to adopt a structured approach to technology implementation, focusing on key elements incrementally rather than embarking on a rapid, full implementation.

Workforce Resilience

Having adequately addressed issues around staff retention and replacement during the next investment cycle, SGN satisfy the review's confidence in their ability to maintain workforce resilience for the delivery of projects in GD2. Strong workforce maintained throughout GD1 which enabled them to achieve all their strategic IT enabling outputs.

In GD1 SGN had a workforce of around 3,900 employees with over 2,500 of these directly engaged in operational IT activities.

SGN has provided precise calculations on the number of employees forecast to leave in GD2. They suggest 400 more employees will leave the company in GD2 compared with the first 5 years of GD1; and they put this increased figure down to churn.

SGN also provide precise recruitment figures, claiming 1,861 new employees will be needed during GD2. This additional recruitment will address some of the skill gaps envisaged as SGN state recruitment will be focused on new skills for the RIIO-T2 period. A coherent plan to replace lost employees and maintain workforce numbers will be required.

Recruitment cycles throughout GD2 will support new technological capabilities needed to deliver the IT outputs in the timeframe. Of the estimated 1,900 external roles SGN will be recruiting for, over 1000 of them will be from outside the gas sector, for roles that do not require skill sets specific to the gas industry including digital and cyber security. The company point out that recruitment throughout GD2 will include 'engineers of the future' with expertise in AI and Deep Learning automation. This will support on their projects such a Technology Readiness and Cyber Resilience.

Technical skills development and internal capability building with SGN is included in all IT outputs put forward. They will use Analytics and AI for wider training, learning and development purposes across their workforce and supply chain through the development of areas such as virtual and augmented reality and predictive information and advisory services.

Approach to change management

SGN include a budget allocation of £304,000 to change management and training throughout the 5 years of RIIO-T2 to support the technology readiness project. However, there is no detail in the projects that demonstrate their approach to change management and that this is clearly understood and therefore would not have an impact on the project delivery and therefore timescale and costs. An example of this lack of understanding on the importance of change management is where SGN rule out the use of Blockchain and Cryptocurrency in Technology Readiness due to the significant costs associated with operating model changes and associated change management.

Risks

SGN has not demonstrated that they understand all the risks associated with their IT strategy and project delivery or that they have an adequate risk mitigation plan in place. Follow on SQ's were raised in response to this area of concern, however the responses to these were not comprehensive,

1. SGN do not provide an adequate discussion of risks and associated mitigations to suggest they have considered all possibilities.
 - SGN provide an Investment Risk Discussion for each of the IT projects with a Risk Matrix included. However, none of the risk assessment is adequately extensive with sufficient detail to suggest they have been understood. Although SGN may be confident in their ability to deliver each of the projects, the lack of considerations for project risks, particularly in delivery suggests a lack of understanding of what it takes to deliver IT enabling outputs, which may have an impact on the project costs and timescales.
2. SGN do not provide enough technical analysis of the specific risks of each IT project.
 - Of the risks that are considered, they are generic and consider high level challenges such as 'Change in Scope' and do not focus on the specific or technical risks that each project might bring. This is of concern as this could impact the projects costs and timescales.

7.3. Cost Analysis - Key Findings

SGN initially outlined 5 investment cases for IT related projects. The IT Cost & Capital Investment Assessment report and the project specific EJP documents describe the projects in detail and were reviewed to assess the projects. SGN then provided several additional EJP and high Cost Benefit Analyses in response to SQ2.

The SGN documents provide good detail around the project scope and timescales. Dependencies are clearly outlined and good justification is provided for the investment cases. There was a lack of detail around the resources required and insufficient cost estimate build up.

There are, however, several identified projects for which EJP have not been received and for which RAG assessments have been relatively critical;

- Telemetry Refresh
- Integration Including Replacement / Refresh
- Regulatory & Mandatory Change
- Front Office Replacement or Redesign
- Device Refresh
- Future Technology Readiness - Analytics, Ai And Machine Learning
- Future Technology Readiness - Internet Of Things, Ot/It, Remote Comms
- Futures - Analytics, AI and Machine Learning

Each project was reviewed using a "bottom up" approach, assessing the quality of the project description across the RAG categories. The results are shown in Table 7-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
IT & Related Telecom: Projects <£0.5m Aggregated	Green	Green	Green	Green
Telemetry Refresh	Amber	Red	Red	Red
Control Room Replacement or Redesign	Amber	Amber	Red	Red
Integration Including Replacement / Refresh	Red	Red	Red	Red
Application Refresh	Amber	Amber	Red	Red
Regulatory & Mandatory Change	Red	Red	Red	Red
Back Office Replacement or Redesign	Amber	Amber	Red	Red
Front Office Replacement or Redesign	Red	Red	Red	Red
Comms Refresh	Green	Green	Amber	Green
Device Refresh	Red	Red	Red	Red
Business as Usual Consumables & Break-Fix Devices	Amber	Amber	Red	Red
Future Technology Readiness - Analytics, Ai And Machine Learning	Green	Green	Green	Green
Future Technology Readiness - Internet Of Things, Ot/It, Remote Comms	Green	Green	Green	Green
Customer Experience & Stakeholder	Amber	Amber	Red	Red
DCC Membership	Green	Green	Green	Green
Open Data	Green	Green	Amber	Amber
Futures - Analytics, AI and Machine Learning	Green	Green	Green	Green
Futures - Internet Of Things, Ot/It, Remote Comms	Green	Green	Green	Green

Table 7-1 - SGN Project RAG Assessments

The BSC requested budget per annum for RIIO-2 is £35.6m, £7.8m greater than the previous annual budget of £27.8m. The requested Non-Op CAPEX budget is £62.8m. The results of the RAG assessment are summarised in Table 7-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
BSC	177.9	27.8	35.6	146.6	17.6%	
Non- Operations CAPEX	62.8			25.4	3.8%	36.4
Sub Total	240.6			172.0	15.8%	36.4

Table 7-2 - SGN CAPEX and OPEX figures

7.4. Conclusion

SGN provides a high-quality business plan with clarity on the project justification and alignment to the Strategy. The IT projects are deemed necessary to support the strategy and are in a considered and well-structured way. They justify how the delivery approach for each project will succeed and include plans for recruitment and training to ensure workforce resilience throughout GD2. The business plan is tightly aligned with the recommendations of the EDTF and the company provides clear evidence that they have will continue to collaborate with the wider industry to move closer to carbon net-zero. Areas that were not as extensively explored by SGN were their risk and change management. The analysis shows their risk assessment was somewhat high level and didn't focus on specific technical aspects of each project and an omission on how they would manage change, which could result in additional costs and delays in projects. When the aggregated composite RAG factor is applied to the requested budget, there is a recommended funding reduction of 17.6% in the BSC budget and a significant recommended reduction in the CAPEX budget of 59.6%. The overall proposed recommendation for reduction in the funding is 28.5% as shown in Table 7-2.

7.5. Recommendations

It would be prudent for Ofgem to consider the following strategic recommendations to support the proposed reductions in Table 7-2.

- Request a deeper analysis of risks and risk mitigation against each project.
- Continue to monitor project alignment to EDTF throughout the investment period.
- Request further assessment of change management approach.

8. NGN

8.1. Overview

NGN has invested significantly during GD1 on transformational change, so much so that they are considered leaders in this sector with other sectors including Government looking to them for lessons.

Effectively NGN did in GD1 what the other companies are hoping to achieve in GD2. This means that for NGN, GD2 will be doing more of the same with an additional focus on the internet of things. Investment will be in workforce training and learning with some technology. It will build on the successes gained from its previous investment. As this is more of an ongoing process, the company has fewer detailed plans than some others. However, this is not to its detriment as it has demonstrated it has the capability, capacity and understanding to undertake and reap the benefits of its previous changes.

Refer to Appendix A for SQ's raised and received during the evaluation process.

8.2. Key Findings

Overall Business plan

NGN adopts the approach provided by one of its stakeholders: "Digitisation is about doing better things, not doing things better..."

The company has revised all aspects of its business including revised contractual Terms & Conditions that provide a more flexible workforce better placed to deliver change. The business plan and accompanying documents provide a degree of confidence that the company understands the challenges it faces and has sufficient flexibility to deliver the changes. However, NGN is still at the start of its change journey and its approach to risk management and uncertainty requires further maturation.

With the planned improvements and compared to RIIO-1, the average domestic customers bills are expected to be 8.6% lower over the five-year period to 2026.

The company is investing in new energy resources and leads a large scale 15-acre NGN site just outside Newcastle, working alongside Northern Powergrid and Newcastle University and is helping to reduce costs in partnership with the EPSRC National Centre for Energy Systems Integration (CESI).

IT & Comms strategy

Historically, NGN outsourced the majority of its IT contracts and operated 7 different IT data centres. This resulted in unnecessary complexity, delays and lack of in-house experience. During GD1 it established its 3iG (Information, Improvement and Innovation Group) to transform IT operational practice and delivery to deliver innovation and improvement projects with information at their core. In this way it has reduced its IT operating costs by £2m c. per year and its 3iG is now a certified SAP Centre of Excellence.

NGN state they are aware of the need to do the right thing rather than the 'shiny thing' - P12 of its digitisation strategy. It states that '*Digitisation is about doing better things, not doing things better...*' This approach is evident throughout their proposal and therefore focuses on improving the work from RIIO-1.

During GD1, NGN has established its 3iG to transform how it operates IT and delivers innovation and improvement projects. The change from IT to 3iG has delivered significant change and transformation initiatives that are better aligned to its needs and at a lower cost. NGN has already realised a wide range of benefits from embracing digital technology and ways of working, all of which support and align to their IT strategy and the wider business strategy.

NGN's future digitisation strategy aims to support its customers by reducing IT cost base and ensuring Integrated Information Management; the understanding that data flows through everything that it does.

NGN used RIIO-1 to transform its business practices which has resulted in a company that is forward looking and flexible in its approach.

A detailed review across the 4 schematic categories is captured in the Cost Workbook. In general, the following trends have been identified:

- The quality of the submissions is good with adequate detail to understand the rationale and the options analysis;

- As NGN will be building on the transformational and systems change developed during RIIO-1, it demonstrates an excellent understanding of the need to do things differently and how technology and better use of more accurate and timely data can transform its workforce as well as improving customer experience. It demonstrates a clear understanding of benefits its digitisation strategy will bring.
- However, due to the adaptive flexible and responsive nature of the new ways of working, some of the prescriptive detail requested is not available as the approach taken is more agile. This does not imply that NGN does not have the level of detail expected, simply that it has adopted a different way of work practice, which means it's not readily available.
- The proposal appears weak in terms of risk identification and mitigations, however with an agile delivery approach, it would not be prudent for them to suggest that these will be developed at the appropriate time
- The build-up of costs for their IT projects are also weak, however an agile delivery approach would in theory support greater control over the costs as these are progressed.
- Roadmaps have not been provided at this stage to show the timing, but outline timelines are given for the majority to show where in the RIIO-2 period they will be delivered along with a summary portfolio view.
- Benefits are clearly identified but no modelling has been carried out to forecast what will be realised and when. The proposed benefits are in line with their strategy for RIIO-2;
- Most projects are focussed on moving off bespoke, customised capabilities to leverage external commodity products to enable data collection and information flow.

8.3. Cost Analysis - Key Findings

NGN has request £40.10M for 22 proposed IT & Telecommunications related projects that have been categorised in 4 schemes, devices and hardware, network, software, and innovation. Information for each project within the schemes was detailed within an SQ response.

The project descriptions found in the SQ response have been reviewed and scored as shown in Table 8-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Devices & Hardware	Green	Amber	Amber	Amber
Network	Green	Amber	Amber	Amber
Software	Green	Amber	Amber	Amber
Innovation	Amber	Amber	Amber	Amber

Table 8-1 - NGN Project RAG Assessments

The project descriptions provided as part of the SQ response gave good detail on the context of the investment and their desired outcomes, they provided an approximate 1-page response to queries raised through the SQ.

Project definition including timing, scale and dependencies

No work breakdown structures had been developed to support the underlying resource FTE requirements. Each project had a start date and expected duration. There was some basic identification of dependencies (i.e. Cloud Infrastructure Development).

Specific points of notes - Devices to Hardware were well defined and gave a good indication of the volume expected.

Definition of required Resources

Generally, resource requirements were identified at a high level (i.e. 1 FTE Project Manager, 4 Business Process Leads), however there was no time-based profiling to show the ramping up and down of the underlying projects.

Supplier costs were separately identified, however apart from “Devices & Hardware/Windows Upgrade” and “Innovation/RPA” there was no separation of labour and licence costs.

Cost Assurity

NGN has significant spend with suppliers, sometimes with a small oversight team from NGN (I.e. PM and Technical Lead). Although some projects had based their costs estimates on RIIO-1, the majority of the costs had been estimated and basis for this estimate was unclear.

There was no indication that the projects had benchmarked their project costs.

Risks were discussed, with typically 1-2 high level risks for each project. These were scored on a High, Medium, Low level and a brief mitigation given, but they were not costed and the costs of risk mitigations or the cost value of the residual risks that remain are unknown. Greater visibility of risk would allow Ofgem to understand the level of uncertainty within each project and the potential for the use of reopeners to share the level of risk.

The BSC requested budget per annum for RIIO-2 is £10.9m, £0.8m less than the previous budget. The requested Non-Op CAPEX budget is £40.1m. The results of the RAG assessment are summarised in Table 8-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
BSC	54.4	11.7	10.9	54.4	0.0%	
Non-Operations CAPEX	40.1			30.1	25.0%	0.0
Sub Total	94.5			84.5	10.6%	0.0

Table 8-2 - NGN CAPEX and OPEX figures

8.4. Conclusion

NGN has a clearly defined strategy and states that it has already realised many benefits through RIIO-1 period, both in cost terms and in improvements to services to consumers. It has been proactive in establishing links with key stakeholder organisations and sharing knowledge, experiences and lessons learned with organisations from a wide range of sectors. However, their approach to risk identification and risk mitigations is limited and therefore without a deeper understanding of this, there is a risk that the project costs could increase or that they experience delays to projects. However, this is offset to some extent by their more agile delivery method, which allows them to in theory have greater control on cost and delivery as they implement the projects.

NGN attempted to provide further costs analysis for their projects which are related as part of the SQ process and this gave expanded levels of information for each of the projects across the 4 schemes. Although this gave an indication that some underlying process had been followed to build IT&T costs, it remained at a high level which was not possible to evaluate and validate.

There is no proposed funding reduction in the BSC budget. There is a recommended 25.0% funding reduction in the Non-Op Capex budget and an overall funding recommendation reduction of 10.6% as shown in Table 8-2.

8.5. Recommendations

It would be prudent for Ofgem to consider the following strategic recommendations to support the proposed reductions as shown in Table 8-2.

- Greater clarity on when benefits will be realised through the RIIO-2 period.
- The Agile delivery approach whilst applaudable, does present a concern that projects costs could increase and delivery timescales can overrun, therefore it is recommended that greater clarity on costs and risks should be understood before funding is released for each project.

9. Cadent

9.1. Overview

Cadent provides 4 gas distribution networks; East of England, London, North West and West Midlands, delivering affordable, safe and reliable heating to over 80% (11 million) of domestic homes and fuelling major industry, businesses, schools and hospitals in England.

Refer to Appendix A for SQ's raised and received during the evaluation process.

9.2. Key Findings

Overall Business plan

Cadent has provided a high quality, clear and understandable business plan, however it should be noted that whilst the business plan is suitable for senior management interpretation, there are several significant gaps in the data which reflects the recommendations being proposed. The focus of RIIO-1 was to extract Cadent's IT+T from National Grid, modernise their IT solutions, reduce operating costs and establish a separate business which is less complex and is not impacted by the overhead of a shared IT estate. Establishing a viable, separate organisation during RIIO-1 allows Cadent to focus on the following themes in RIIO-2:

- investing in modern, standardised, consolidated, commoditised technologies for their standard technologies (Compute; Networks; Security; CNI; ERP; Business Applications; Supplier Management; GIS; Data; EUC;)
- invest in innovative and differentiating technologies (Field Technology; Customer Experience; Analytics; Future Tech;)
- establish an efficient IS sourcing strategy and operating model that favours internal capabilities (enterprise architecture; development; support) and external capabilities via a small number of key strategic delivery partners (networks; hosting; infrastructure; applications; service management; CSOC;)

These themes are underpinned by an extensive set of investment drivers that relate to the failure modes that would affect the health of a given asset, the exacerbations that would influence the level and frequency of investment and impact of failure to maintain asset health. This is a sensible approach, in line with best practice and the direction of travel for the industry so, if achieved, should be successful for Cadent.

By contrast to this high-quality capture of their strategy, the details of their proposed investments are mixed. In general, Cadent has outlined the rationale for the requested projects and how they contribute to their strategy. However, there is minimal information provided on the technologies to be implemented using the requested funding, as this has been profiled using a top down approach based on RIIO-1 deliveries of similar scope and scale. The plans for delivery and work breakdown structures are not defined at this stage either. Benefits are generally not specifically identified, assigned metrics or forecast but there are some good examples with ambitious, banked targets. The overall project definition, scale, dependencies and resources required to support implementation are not well defined and understood and therefore poses potential risks to costs and delivery in the future.

IT strategy

The requested £99.3m for IT Investment is distributed across:

Initiative	TOTEX (£m)	Efficiencies (£m)
1. Smart Networks/Assets/Sensors	13.2	
2. Customer Experience	9.1	
3. Analytics/Artificial Intelligence/Machine Learning/Management Information	2.1	
4. Cloud/Automation/Robotics	56.8	
5. Workforce of the Future (Field Technology)	12.8	
6. IT Operating Model (i.e. tenders for strategic supplier)	5.3	-4.5
IT Investment Total	99.3	

These investments align with the themes of their RIIO-2 strategy:

- 1-5 represent the differentiating technologies in which Cadent is seeking to invest and innovate;
- 6 represents the efforts to establish an efficient IS sourcing strategy and operating model that will focus on procuring services from strategic suppliers for the cited standard technologies.

Options analysis was carried out for each area of investment with the following parameters:

- Baseline – As-is: maintain the basic elements of the as-is;
- Option 1 – Proposed: balance of maintenance of asset health and investing selectively in differentiating technologies;
- Option 2 – Minimise Investment: remove and reduce reliance on technology;
- Option 3 – Full Transformation: maximise investment to transform services.

Cadent has applied a general view to these initiatives that they will not achieve their RIIO-2 obligations via the Baseline Option or Option 2 and Gartner advised against the high risk of not realisation the benefits of the innovative and untested technologies of Option 3, leaving a general bias towards the proposed balanced Option 1. They have provided more detail on the options for all proposed initiatives with >£5m TOTEX and for some with <£5m TOTEX to allow for more detailed assessment, captured via the Project RAG spreadsheet.

The requested £18.8m for IT Innovation is divided across the following initiatives where each has been provided with seed funding, part funding or full funding for RIIO-2 based on the options analysis carried out.

Initiative	£m	Option Chosen
INVP 5101IN Sensor Telemetry & Smart Devices	5.67	2. Part fund
INVP 5104 The Internet of Things	2.84	1. Fully fund
INVP 5205IN Customer Insight & Segmentation	1.32	1. Fully fund
INVP 5301IN Analytics, Artificial Intelligence & ML	5.48	1. Fully fund
INVP 5304 Digital Twin	2.99	1. Fully fund
INVP 5405 Automation	0.24	3. Seed fund
INVP 5504 Wearables / Virtual Reality, etc.	0.24	3. Seed fund
IT Innovation Total	18.8	

The levels of funding are characterised as follows:

- Full Funding – could be fully implemented or at significant scale in RIIO-2. Benefits are clear.
- Partially Funding – innovation has been tested in other organisations with identified benefits, but a trial or series of trials is required to adapt the innovation to Cadent's needs
- Seed Funding – innovations will deliver net present value outcomes, but an up-front investment is required to prove the innovation, such that this will not be beneficial during RIIO-2

These initiatives align with Cadent's RIIO-2 strategy themes around investing in their differentiating technologies.

While benefits are identified for all innovation projects, they have not been quantified at this stage. Although the rationale for this is not stated, this is the correct approach to take with innovation projects so as not to constrain them to focus on that goal and to allow for failure in the pursuit of actual innovation.

These innovation initiatives represent opportunities for further benefits realisation/efficiency savings if proven to be viable and those not fully funded could be considered for additional funding during the RIIO-2 period (up to the estimated total of £29.77m).

The requested £5.7m for Data + Digitalisation is divided across:

Initiative	£m
Data Projects	2.8
Data Cleansing	1.4
Data Transformation	1.5
Data + Digitalisation Total	5.7

These initiatives will be delivered via the existing Data Transformation Programme.

Separately to the Data Transformation Programme, the IT Innovation projects *INVP 5301IN Analytics, Artificial Intelligence & ML and INVP 5304 Digital Twin* contribute to Cadent's Data and Digitalisation Strategy as they are aiming to improve how Cadent make use of their own data to run the business.

While Cadent's Data and Digitalisation strategy talks about aligning with and adopting the EDTF recommendations, the projects they have identified for RIIO-2 do not convert this intent into action to achieve these aims:

All three projects are deemed necessary enablers to bring Cadent's maturity around data management up to a sufficient level to begin to act on the EDTF recommendations and the emergent best practice being defined by the Modernising Energy Data (MED) initiative. Beyond this, Ofgem should leverage Cadent's openness for engagement to significantly bolster their plans in this space and should make additional funding available to deliver this once clear on what Cadent need to do to meet the EDTF recommendations and MED best practice.

Delivery approach

Cadent has stated that they have not yet broken down their investments to projects and have not identified project milestones at this stage. They also state that in most cases they have not yet appointed a supplier or started work. Equally, they do not yet know the end state architecture or the hardware or software components that will be implemented via these investments. A degree of uncertainty around scope of initiatives is not unsurprising at this stage but this level of ambiguity around the intended use of the requested investments seems too high to justify requests for full funding at this stage.

Cadent's initiatives will be delivered using their solution delivery framework (SDF) IT delivery process, which was provided on 28th February as a response to SQ1. This is an adapted PRINCE2 framework consisting of portfolio planning and demand management leading to prioritised projects which use a phased approach to delivery, broken up by stage gates with defined criteria. This is a common approach to delivery of waterfall projects and can be adapted for delivery of agile projects (such as their cited Innovation projects) but it requires adept design to ensure the two will work well in tandem. In response to SQ9, Cadent has confirmed that they predominantly use a Waterfall methodology for project delivery for IS, largely due to the legacy nature of the majority of the IS systems. This is sensible as Waterfall is suited to the delivery of large, highly complex, business critical systems to ensure effective de-risking of solutions before progression to the next stage of delivery and to ensure supportability once installed. In this response, Cadent describe that they do additional use a hybrid or blended approach, combining Waterfall and Agile approaches, predominantly for Software Delivery Lifecycle projects. This is reassuring as using Waterfall techniques to deliver the Innovation projects would be an error as the nature

of innovation is such that clarity on an end state is not known at the outset,, there is a lot of uncertainty about routes that can be taken and iterative scaling and testing is needed, all of which is best delivered using Agile techniques. To note, it has not been confirmed how these projects will be delivered at this stage. Cadent confirm that the Hybrid approach is used within the SDF and no changes have been required to the SDF to facilitate delivery using this approach. They state their intention to move to a more agile delivery model over time. However, there is no indication of how that change would be achieved but there is an ongoing review into how Cadent develops and improves its delivery approaches. Finally, Cadent explain that the SDF will be used internally for management of projects and programmes, but suppliers can adopt alternative approaches to drive their delivery as they see fit. This seems like an odd stance to take and may negate the value of having a consistent approach for delivery.

Cadent's approach to allocation of delivery responsibilities as part of portfolio management was further broken down in their response to SQ6 to better understand how projects and programmes are set-up. The contracting strategy referenced in this answer looks to be a robust process, ensuring outline objectives, benefits, costs and constraints are defined for initiatives to inform prioritisation by the central Cadent team during work selection. From a technical governance perspective, the Cadent IS Architecture Team are responsible for setting outline design principles at the outset during initial technical design to ensure that any solutions delivered are in line with Cadent's enterprise architecture framework. The final point to note on this is that, while programme delivery is generally planned to be outsourced in RIIO-2, Cadent will retain project/programme management oversight and accountability as the lead for all IT projects. Overall, this looks to be a sensible and mature approach to delivery and the artefacts provided for an example project, Fatigue, show that it is being applied in practice to produce quality artefacts to support deliver.

This delivery framework is of increased importance as Cadent's corporate-level operating model shifts in RIIO-2 to be depot/customer-centric. This move allows for regional accountability for network outcomes, regardless of who is delivering the work (Cadent or 3rd party). The SDF will need to be of high-proficiency for Cadent to deliver their RIIO-2 portfolio in this environment as it requires IT to balance the provision of capabilities to Cadent staff on a regional basis against the themes expressed above about maintaining consistent, commoditised and standardised technical architecture landscape and ensuring these services are efficient and reliable. While possible, this also requires adept technical architecture governance and capable handling of contracts with suppliers.

Workforce Resilience

Cadent has not yet broken down their investments into projects with a work breakdown structure, so it is unlikely that they have a view on the number of resources, internal or external, that they will require to deliver their portfolio. They have equally not yet engaged with their supply chain to determine the external resources they will draw on and ensure that these can be provided.

During RIIO-2, Cadent plan to primarily outsource programme management and delivery to their Tier 2 suppliers, mitigating any risk around internal constraints on resources. They have themselves cited the risk of lack of resource as low in terms of likelihood due to the existing contracts with partners such as HCL, BT, Vodafone and Verizon and their Tier 2 suppliers. This shows that they have confidence that they will have the resources required to deliver their portfolio and it is hard for this to be tested in anyway at this stage. However, the fact that these suppliers have not be contracted yet means this risk is not mitigated.

Training is referred to as a key element of the Data Foundation Programme but is not referenced elsewhere in the outline of IT+T initiatives provided. It is unclear if this is because training is not needed, it is captured within other initiatives or whether it has not been considered within their RIIO-2 plans. However, training needs are assessed as part of Cadent's Change Management Framework (under the header "Training Impact") which is used for all projects (discussed in more detail below) so this should ensure that training is captured in all initiatives planned for RIIO-2.

Approach to change management

Cadent use a standardised Change Management Framework (CMF) to drive definition and delivery of business change and benefits management activities associated with the delivery of projects. This works in tandem with the portfolio prioritisation approach and the SDF. A detailed run-through of the framework was provided in response to SQ6. The CMF sets out a phased approach with gates that define the required documentation needed to proceed to the next phase, equivalent to the SDF approach. At a high level, these phases are: Change Impact Assessment; Engage; Diagnose; Design; Test and Refine; Implement; and Sustain. The change impact assessment for an example project, Fatigue, has been provided which shows it is a mature approach, it is tailored to delivering in Cadent and the analysis captured provides recommendations on the business change approach

necessary for the scale of the initiative. Documentation is not provided for subsequent sections of the framework but, assuming they are of similar quality, it is fair to say that this is a high-quality framework.

The CMF also defines Cadent's approach to benefits management which will be used for all IT+T projects, including realisation of the forecast £9m efficiencies during RIIO-2 and £3.6m p.a. post RIIO-2 of efficiencies to be delivered by their IS investments. This approach is not shown explicit in the documentation provided but the benefit tracking tool for the example project, Fatigue, is again provided to show how this is put into use. This alludes to a reasonably mature approach to benefits management with clear benefits categorisation and tiering, assigned owners and links to the RIIO objectives with set measures for these contributions. Benefits tracking is a little more mixed: forecast dates, actual status, baselines and targets are set, but the majority of the baseline, target and actual entries do not have clear, measurable metrics given. While mixed in maturity, this looks to be a good approach to benefits management that should support efforts to realise forecast benefits.

Given the lack of definition of projects at this stage, there is no indication that these activities outlined in the CMF have been included in their proposals. However, given that Cadent has stated that they will use these frameworks for delivery and that the top-down cost estimates are based on previous delivery (where it is assumed the CMF was used), it is assumed that these activities have been factored into their requested funding for delivery of their portfolio.

Risks

Cadent has cited 6 key risks to delivery of their IT+T initiatives in RIIO-2:

ID	Description	Mitigation	Analysis
1	Lack of resources to deliver	Use of Tier 1 and Tier 2 suppliers	Adequate mitigation, no way to further analyse low likelihood assessment at this stage
2	Cannot achieve targets	Use of existing contracts for contract rates, forecasting of costs and negotiation with suppliers	Not specific to RIIO-2 but higher risk as Cadent are a new business. Agree with medium likelihood assessment and mitigation is logical.
3	Unforeseen outages leading to delays	Use of existing ITIL change management processes	Not specific to Cadent or RIIO-2 so confident this can be mitigated based on staff experience from NG/Cadent
4	Unseasonal weather	Avoid change freeze in Winter and plan contingency option	Not specific to Cadent or RIIO-2 so confident this can be mitigated based on staff experience from NG/Cadent
5	Unidentified obsolescence in RIIO-2	Maintain IT asset plan to forecast obsolescence. Contract to avoid obsolescence.	Not specific to Cadent or RIIO-2 so confident this can be mitigated based on staff experience from NG/Cadent
6	Legislative Change	Communicate with Ofgem to forward plan and make aware of impact	Sufficient mitigation to manage as out of their hands.

The above cited risks are reasonable and logically mitigated. Key risks not cited however are:

Description	Mitigation	Analysis
Technology change during RIIO-2	The likely mitigation for this is to outsource supply to providers who can adapt to this change	This will need to be built into the contracts that are agreed with these suppliers for RIIO-2;
Business' ability to accept the changes proposed in RIIO-2 plan	The likely mitigation for this is to have a sufficiently robust approach to business change	Application of Cadent's CMF should be adequate to mitigate this risk
Lack of competition inherent in their chosen outsourcing model of key strategic partners rather than opting for using interlinked strategic partners	Cadent provided more detail on this in response to SQ7: the option of interlinked strategic partners was not taken because "there were a limited number of successful case studies [they] could find and Cadent's IT capabilities were not mature enough post separation from National Grid to implement such a model.". In this response, Cadent additionally outlined that they mitigate this risk by going to market on fixed cost areas, using frameworks to receive bids for demand-driven work (e.g. projects) and following the Utilities Contract Regulations 2016 which are rigorous and ensure compliant "got to market" RFP processes are used.	This is sufficient explanation to have confidence that Cadent will manage this

9.3. Cost Analysis - Key Findings

The RAG review of Cadent addressed 21 activities with a total funding requirement of £ 102.87m. Cadent identified projects which individually had funding requirement in excess of £5m and, within the 6 general categories, aggregated costs for projects with costs of < £5m.

Information regarding Cadent IT&T costs was contained within the document Appendix 09.30 – Technology, and further supported by supplemental questions, the most significant of which was SQ-1 which provided summary expenditure for projects >£5m. The scale and precise extent of these lower value projects is unknown and therefore more scrutiny is required of these funding request.

The project descriptions found in the SQ response have been reviewed and scored as shown in the RAG assessment as Table 9-1. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
INVP 5103 Gas Supply and Engineering Framework	Amber	Amber	Red	Amber
Smart - Total of Investments <£5m	Amber	Red	Red	Red
Customer - Total of Investments <£5m	Amber	Red	Red	Red
Insight - Total of Investments <£5m	Amber	Red	Red	Red
INVP 5402 Core Asset and Plant Management Strategy	Green	Amber	Amber	Amber
INVP 5403 Non Core Business Support Applications Strategy	Amber	Amber	Red	Amber
INVP 5404 GIS Replacement / Re-Tender	Green	Amber	Red	Amber
INVP 5409 HR, Payroll and Workforce Transformation	Green	Amber	Red	Amber
Cloud - Total of Investments <£5m	Amber	Red	Red	Red
INVP 5503 Device Replacement	Amber	Amber	Red	Amber
Workforce - Total of Investments <£5m	Amber	Red	Red	Red
INVP 5704 Networks, including moving to Software Defined Networks	Green	Amber	Red	Amber
Operating - Total of Investments <£5m	Amber	Red	Red	Red
Data - Total of Investments <£5m	Green	Red	Red	Red
INVP 5101IN Sensor Telemetry & Smart Devices	Amber	Red	Red	Amber
Smart Innovation - Total of Investments <£5m	Green	Red	Red	Red
Customer Experience - Total of Investments <£5m	Green	Red	Red	Red
Insight Innovation - Total of Investments <£5m	Amber	Red	Red	Amber
INVP 5301IN Advanced Analytics, Artificial Intelligence & Machine Learning	Amber	Red	Red	Amber

Table 9-1 - Cadent Project RAG Assessments

Project definition including timing, scale and dependencies

Generally, project definition was poor. For the large projects there was some broad detail of the timing of activities. However, scale and dependencies for each project were generally poorly defined.

Specific points of note - INVP 5402 Core Asset and Plant Management Strategy produced a comprehensive list of applications, however it was unclear which applications were being replaced and when.

INVP 5704 Networks, including moving to Software Defined Networks provided some rudimentary timescales and acknowledge dependencies, but discussion of the correct approach was weak.

Innovation related projects had aggregated spend profiles, which made it hard to infer the plan for individual projects.

Definition of required Resources

Generally, the resources required to deliver the project were not defined. Therefore, it was not clear if the resource were fully understood and costed appropriately.

Specific points of note - INVP 5503 Device Replacement the profile and scale of the type of devices to be replaced were unclear. It was also unclear if 1 or 2 replacement cycles would be undertaken

Cost Assurity

Underlying cost build ups of projects were not provided, therefore cost assurity was weak.

On some projects, costs had been provided by third parties (i.e. Vodafone for INVP 5101IN Sensor Telemetry & Smart Devices), however it was unclear as to the level of rigour and competition in which such costs were determined.

Several other projects advised that they had validated costs against a review of market rates, however specific details of what elements had been verified were not provided and whether this applied to underlying labour rates or the total project value. However, Gartner have undertaken an analysis of IT&T spend and this has been reported at a very summary level against the preferred options for each IT&T strategy area. Cadent proposed costs are generally below the lower end of Gartner's expected ranges, 3 strategic areas sit within Gartner's expected range – but are within the lower half of those ranges.

Risks were identified at a high level across the IT&T portfolio or at a perfunctory level within each of the major projects – however it was not possible to understand either within each individual project or across the portfolio what the costs of risk mitigations were or the cost value of the residual risks that remained. Greater visibility of risk would allow Ofgem to understand the level of uncertainty within each project and the potential for the use of reopeners to share the level of risk.

None of the large (>£5m) had undertaken an evidenced based approach to costing. For 7 of the large (>£5m each) projects Cadent has not completed a detailed design or tender event, so they did not have a granular breakdown of costs between direct costs, supplier costs, equipment costs, software, licences or contingency allowances. The £55.47m cost of the following projects have been based on individual estimates by Cadent of a reasonable allowance for all those granular elements. These allowances have not been shared and are therefore unvalidated.

- INVP 5409 HR, Payroll and Workforce Transformation
- INVP 5404 GIS Replacement
- INVP 5301IN Advanced Analytics, Artificial Intelligence & Machine Learning
- INVP 5402 Core Asset and Plant Management Strategy
- INVP 5503 Device Replacement
- INVP 5103 Gas Supply and Engineering Framework
- INVP 5704 Networks, including moving to Software Defined Networks

From the level of significant figures in the project costs provided it appears that allowances are defined as £10k and as a result may have some semblance to fact or historic information.

Opex and Capex costs related to Data Cleansing, Projects and Transformation collectively amount to £5.7m and could be regarded as a major investment. There is a rudimentary description of some of the sub-projects undertaken and a timeframe can be deduced from the associated spend profile. Data cleansing is evenly distributed across the period, though greater upfront activity would be expected in order to get the data fit for purpose and enable both projects and transformation to be a success.

The £2.99m proposed investment for developing digital twins is based on an estimate from the experience of an external company. Given that the exact platform and systems that Cadent would want to use are unknown at present and would need to be explored as part of the approach, further clarification on the basis of the estimate production would be warranted.

Cadent has not specified the CAI costs. The BSC budget per annum is in alignment with the previous spend with only a £0.1m difference between the RIIO-1 and RIIO-2 budget. The requested CAPEX budget is £102.9m.

The results of the RAG assessment are summarised in Table 9-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
BSC	238.1	51.1	47.6	238.1	0.0%	
Non- Operations CAPEX	102.9			7.4	25.0%	93.0
Sub Total	341.0			245.5	1.0%	93.0

Table 9-2 – Cadent CAPEX and OPEX figures

9.4. Conclusion

Cadent has provided a high-quality plan with a clear strategic direction and well aligned objectives and their proposed initiatives align well to this plan. This has been supported by high-quality detailed responses to SQs raised during the review.

Assessing their strategic approach, their objectives around consolidating and converging on their standard technologies and around investing and innovating in their differentiating technologies is in line with best practice to ensure they realise the benefits of their independent organisation. They cite that they will realise £9m in efficiency savings in RIIO-2 and £3.6m p.a. beyond then as a result of their investments, which is encouraging.

Their approach to innovation is sensible, providing levels of funding to initiatives in relation to their level of uncertainty and not expecting success from all initiatives. This will likely lead to further strong efficiency savings/benefits realisation in RIIO-3 and beyond.

The lack of substance regarding the build-up of Cadent projects meant that they were poorly justified from a cost perspective. In addition, the miscategorising of small projects, for which no underlying project details were provided, lead to a significant funding request with inadequate supporting detail.

In terms of their approach to delivery, their processes around portfolio planning, change management and benefits management look to be of high quality. Further detail on their solution delivery framework is needed to have confidence that this is of equally high quality and inform the overall level of confidence that Cadent can deliver the projects they have outlined. The principle concern at this stage is the general lack of definition around these proposed initiatives as they do not yet know what they will be delivering and by whom it will be delivered.

The poor aggregated composite RAG score has a substantial impact with the requested CAPEX budget falling from £102.9m to a recommended allowed spend of £7.4m, representing a recommended funding reduction of 92.8%. The overall proposed recommended funding reduction is 28.0% as shown in Table 9-2.

9.5. Recommendations

It would be prudent for Ofgem to consider the following strategic recommendations to support the proposed reductions in Table 9-2.

- Additional funding could be ringfenced to provide to Cadent for the IT Innovation projects that Cadent did not request to fully fund at this stage (*INVP 5405 Automation; INVP 5504 Wearables / Virtual Reality etc.; INVP 5101IN Sensor Telemetry & Smart Devices*). Cadent should be allowed to request this funding if the initial seed or part funding leads to the successful identification of a viable solution that can be scaled up for implementation. Cadent has estimated the additional funding that would be needed for scaling up identified solutions for projects that haven't been fully funded would be £29.77m.

- The outputs of the review into Cadent's delivery approaches should be requested to build confidence that they can deliver their RIIO-2 portfolio.

10. WWU

10.1. Overview

The WWU Business Plan provides a confident narrative that provides an optimistic outlook. However, there is a significant lack of detail, so much so that it was difficult to find mention of specific projects, timescales or interdependencies contained in the business plan or supporting appendices. Despite SQs and the further details supplied, the information remains insufficient to reach an informed judgement on the feasibility, competence or value for money considerations. This does not mean that WWU cannot deliver its stated objectives, nor deliver its proposed projects, merely that it has not provided sufficiently detailed information on which to form a judgement. For example, a road map from current to future state does not contain timescales nor does it highlight critical variables/influences or key decision points. The high-level project plans provided are also lacking in the detail required to reach an informed opinion.

Refer to Appendix A for SQ's raised and received during the valuation process

10.2. Key Findings

Overall Business plan

Superficially the WWU Business Plan contains excellent intentions. There is nothing to suggest it will not deliver on its stated aims. However due to the paucity of the information it has provided, it has been difficult to arrive at an informed opinion on its competence to deliver. It is for those reasons that the recommendations have been derived at 10.5.

Much of the expected detail and information is missing, replaced by 'redacted for commercial in confidence reasons. WWU were late replying to the SQs. Though there is no fault in what the report states, there is a lack of detail that makes the statements superficial at best. For example: *'Artificial intelligence and process automation will both lead to more accurate forecast and control systems.'* This is presented as a statement of fact and yet no evidence to support this statement is included. Even if this is true, there is no mention of what is required – in terms of technology and skills – of how this can be achieved or in what timescales.

The company also states that 'the opportunity to gain visibility of forecast demand and capacity across the energy sector, through shared data services could provide better insight into selecting the most efficient generation option, at any given point in time' 'but again provides no detail on how it proposes to gain visibility of forecast demand or how it would subsequently steer its infrastructure to deliver the most efficient generation option at any given point in time.

The plan states that its net zero Consumer Value Proposition (CVP) delivers £4.3bn of value; our vision delivers over £30 of net value for every £1 invested yet provides insufficient detail on how this will be achieved.

IT & Comms strategy

WWU states that its transformation programme 'will harness their capability to bring together; people, information and processes in the best possible experience for our workforce and customers'. Yet no details are provided on what resources and timescales will be needed to achieve this.

WWU states it will become a cloud first business. In previous investment periods, it invested in virtualisation of on-premise infrastructure but notes that the move to cloud offers a 'considerable improvement whilst also adding agility.' WWU intends to complete the process in 2021.

WWU appears to rely on the hope that moving to cloud based applications will be a solution for its future operations. For example, it states that 'Cloud services let us build scalable and reliable solutions on demand without large capital investments' but makes no mention of the costs involved in moving to cloud based services, any workforce training that might be required nor any costs of evaluating various cloud applications as recommended in its own independent review, which recommended WWU should evaluate cloud-based solutions and bring together a coherent roadmap of activities and interdependencies

On Cyber Security strategy, WWU states it will build inherent security into the design stage, on a zero-trust basis Whilst there is nothing inherently untoward about these intentions, WWU simply provides no further information on what parameters will be considered in the design process. For example, will the design consider only software or software, hardware and staff resource?

WWU's mention of Digital Utility states its intended standardisation of technology platforms and data

Structures 'will assist in achieving this and if we can leverage the value, then opportunities may

Arise'. The expectation would be that WWU would have a considered appreciation of the possible and probable opportunities that would arise from this investment. Instead it appears that it intends to make the investment with little clear understanding of what benefits will result.

WWU's Independent report contained in Appendix 9L states that as WWU moves forward with its digital plans it is likely to find it needs additional resources, and possibly additional skills, over and above those it currently possesses. Yet little mention is made of how it will address this in its business plan.

The independent report also notes that on SCC Infrastructure Services 'there are a number of areas where the service quality still falls below the levels enjoyed by the peer organisations. The "cheap and cheerful" approach to delivering IT services will become increasingly risky'

The independent report recommends development of a long-term skills strategy particularly in the Retained Team Application Services to ensure the Retained Team effectively manages successful outcomes.

The independent report does find that more of WWU's systems applications are much older than their peers and that WWU must adopt better asset management and maintenance systems and processes. On that basis alone, it is clear that WWU must source investment funding to improve its service.

SQ2_WWU_SQ_CA_13 states that the 'Full programme plan and interdependency mapping has not been completed at this stage but would be completed as part of project inception as per the IT project delivery methodology'. And that there is no risk mitigation plan in place to date. WWU also confirms that there is no mention of a cultural change programme in its business plan despite its stated intention to change to cloud based solutions and Appendix 9L states it will need additional resources, and possibly additional skills, over and above those it currently possesses.

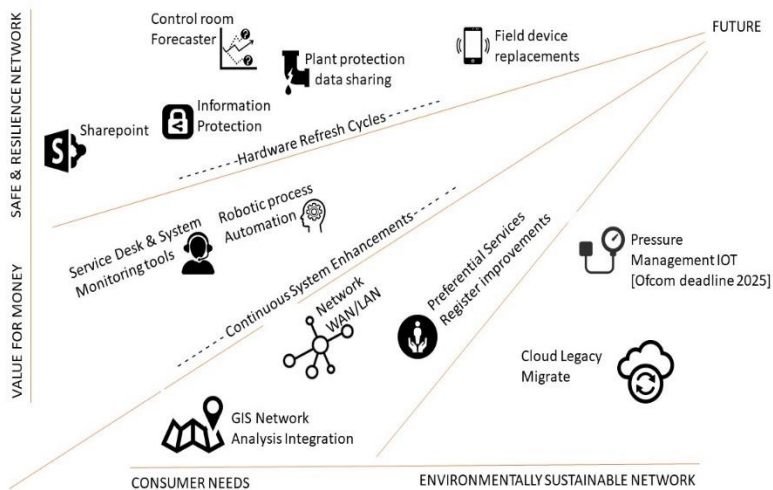
There appears a lack of coherence across its report, appendices and responses to SQs that is somewhat disconcerting.

SQ1_WWU_SQ_CA_11 (2) clearly states the strategic outcomes and provides a high-level roadmap and project plan. Unfortunately, neither of these provides confidence of WWU's level of understanding of what is required to realise these outcomes or by when. It states that WAN & LAN, and TELECOMS services are all critical dependencies for the communication of the organisation and require continued investment, yet it makes no mention of how the investment will be used, for example does WWU intend to replace hardware and/or software on a set time interval?

Key	Strategic outcomes
A	Meet the needs of our consumers and network users
B	Delivering an environmentally sustainable network
C	Maintaining a safe and resilient network
D	Delivering value for money

The roadmap does not contain timescales, key dependencies, variables or critical decision points. The project and programme specific risks and dependencies are not identified, instead they will be identified using WWU's standard project delivery methodology at inception stage. Though it is reasonable to expect the specific details to be identified at inception stage, it is also reasonable to expect some high-level planning to be in place at this stage.

For example, this information would inform the funding decisions, but the information simply has not been provided.



A detailed review of each individual project is captured in the Cost Analysis Workbook. However, it should be noted that the projects have not been clearly identified in the business plans and has required projects to be identified making assumptions on projects. This concern has been raised through the SQ process, but insufficient response has been provided. In general, the following trends have been identified:

- The quality of the submissions is poor with insufficient detail to understand the rationale and the options analysis;
- WWU has justified its approach in the context of its IT strategy, but this justification is without detail or substance. There is insufficient detail to make an informed and confident judgement on the IT strategy viability and success.
- WWU's own independent benchmark report notes some areas of concern: its network support price is 11.2% higher than its peers; it has 21.2% older systems than its peers, service quality has decreased since 2015 and incident reports have increased since 2018 leading to recommendations for better asset management and maintenance as well as an adapted infrastructure, though it also recognises some areas of good practice and where WWU equal or better their peers. However, the detail to support this analysis has not been provided.
- Where this is not the case and the risk of creating unwieldy capabilities that are costly to maintain needs to be monitored;
- Projects range from moving to cloud based solutions, to integration of data technology systems
- WWU's own independent report highlights a previous 'cheap and cheerful; approach is not sustainable. This would suggest a cultural change programme is required and yet the business plan makes no mention of this and SQ responses clarify that there is no such plan. There is a lack of consistency between information contained in the business plan and its appendices and SQ responses which together provide the impression of a lack of understanding of what is required to achieve its stated outcomes.

10.3. Cost Analysis - Key Findings

The RAG review of WWU identified 13 projects with a total funding requirement of £31.6M.

The bulk of cost information was contained within an embedded file GD2 Project Cost Mapping.xls contained within a response to WWU_SQ_CA_11, with additional explanatory text contained with the WWU_SQ_CA_11(2) file.

The RAG assessment of the WWU projects is presented in Table 10-1. Observations on the presented information and the basis of the RAG assessments are presented below. The assessment assumes that no REDs are permissible before a project is deemed inadequately defined to secure ex-ante allowance at this stage.

Project	Justification for project	Project definition including timing, scale and dependencies	Definition of required Resources	Cost Assurity
Automation	Red	Red	Red	Red
Software Licenses	Red	Amber	Red	Red
Software Upgrades	Red	Amber	Red	Red
Major Software Upgrades	Red	Amber	Red	Red
Compliance	Red	Red	Red	Red
Smart Devices	Red	Amber	Red	Red
Analytics	Red	Red	Red	Red
Major Infrastructure Upgrades	Red	Amber	Red	Red
Landscape Optimisation	Amber	Amber	Red	Red
Information Management	Red	Red	Red	Red
Minor Enhancements	Red	Red	Red	Red
Ongoing Hardware	Amber	Amber	Red	Red
Other Minor projects - not described	Green	Green	Green	Green

Table 10-1 - WWU Project RAG Assessments

Project definition including timing, scale and dependencies

Project definition is perfunctory, with a short paragraph provided. It is hard to gauge the scale for many projects and dependencies are weak. Some projects have been decomposed into sub-projects (by virtue of there being an individual cost profile for the separate tasks), with some of these having distinct time bound cost profiles. However, the categories for Automation, Analytics, Information Management and Minor Enhancements have no breakdown into specific projects.

Definition of required Resources

There has been no description of resources and therefore WWU capacity to deliver the projects is uncertain.

Detailed cost breakdown of tasks typically spreads expenditure evenly through the year indicating a lack of a profiled resource plan reflecting typical project lifecycles

The categories of Ongoing Hardware and Software Licences have specific separate projects however within these it is not possible to determine if there are elements of staff effort as opposed to licence fees or 3rd party hardware fees.

Software Licence fees breakdown seems low and it is expected that costs associated with major projects (such as SAP S/4) are listed elsewhere, costs are evenly spread across the year rather than at specific point when licences could be expected to renewed or ramped up over time as the volume of cloud based “pay as you use” services increases.

Cost Assurty

The basis for costs is unclear, many costs are whole annual figures which would imply a significant use of poorly validated assumption-based costs.

Where costs have been broken down into projects that majority have costs are evenly spread across the entire RIIO-2 period rather than profiled to meet specific events. The Smart Devices and SCADA upgrade projects have defined spend peaks; however, the underlying costs drivers are not apparent. It is also unclear why a major upgrade for SAP S/4 (£1,500k) is taking place immediately after a release upgrade (£500k) in 2024.

There has been no apparent treatment of risks within the cost figures or at a project level. A series of high-level risks were described in the response to the SQ process; however, these are neither categorised in cost nor probability terms. Described mitigations are high level and how these are managed within individual projects is unclear.

There has been no obvious benchmarking activity to show that costs lie within acceptable ranges.

WWU has not specified the CAI costs. The RIIO-2 BSC budget per annum is significantly lower than that for RIIO-1 and hence the requested funding is recommended. Of the requested Non-Op CAPEX budget of £31.8m only £5.1m is allowed which is the budget for the collected low value projects.

The results of the RAG assessment are summarised in Table 10-2.

Expenditure (all in £m)	Requested	RIIO-1 BaU annual spend	Forecast RIIO-2 BaU annual spend	Proposed for ex-ante allowance	Ex-ante Funding reduction (%)	Proposed for Uncertainty Mechanism
BSC	28.4	8.9	5.7	28.4	0.0%	
Non- Operations CAPEX	31.6			5.1	0.0%	26.5
Sub Total	60.0			33.5	0.0%	26.5

Table 10-2 – WWU CAPEX and OPEX figures

10.4. Conclusion

Though WWU may have the capability and understanding to undertake all the necessary project planning and costs benefit analysis, etc., the company has not provided sufficient information to facilitate an informed judgement regarding its capability and understanding. The company appears to be waiting until it has the funding before providing this detail.

The level of detail provided for WWU projects was at such a high level that detailed review was not possible, therefore it was not possible to understand what the main levers of cost within the projects were and whether these represent value for Ofgem and the public.

Proposed funding can be found in Table 10-2.

10.5. Recommendations

It is recommended that WWU be invited to provide more detailed explanations of their proposed IT&T projects.

It would be prudent for Ofgem to consider the following strategic recommendations to support the proposed funding reductions in Table 10-2.

- Further requests for details on WWU's IT Strategy and alignment to business Strategy and how the proposed projects support this
- Further requests for details on proposed benefits and how they will be realised during the RIIO-2 period
- Details on the cultural and change management programme required to support a move from cheap and cheerful approach to their IT strategy as noted in the WWU independent report.

Discussion

There are two potentially opposing trends when considering the accuracy and likely future movement of project schedule and cost forecasts – Cost Uncertainty and Optimism Bias. These 2 empirically observed trends are discussed in this section. When considering a single point estimate of costs and schedule, as clarity in the proposed solution increases, the forecast is likely to drop as the uncertainty in the estimates reduces over time. Conversely, Optimism Bias suggests that project forecasts suffer from estimating optimism which fails to identify, monitor and mitigate the impact and probability of risks to which the project is subject. As an understanding of the project matures or risks actually occur and become issues, the project costs and duration is observed to increase. The absence of evidence that good project management and forecasting practice has been implemented makes it difficult to estimate which trend may dominate the delivery of ESO's investment projects – with luck they may cancel each out, resulting in the current estimates appearing correct.

In considering the merits of the plans and forecasts presented by the network companies Atkins suggest Ofgem consider the following topics, one of which relates to the presented cost forecasts and the other two to the general cost forecasting.

10.6. Company cost proportions

Atkins has collated the proportions of each funding type i.e. CAI, BCS and Non-Op Capex for each company. Figure 10-1 presents the proportions of the funds requested by each company.

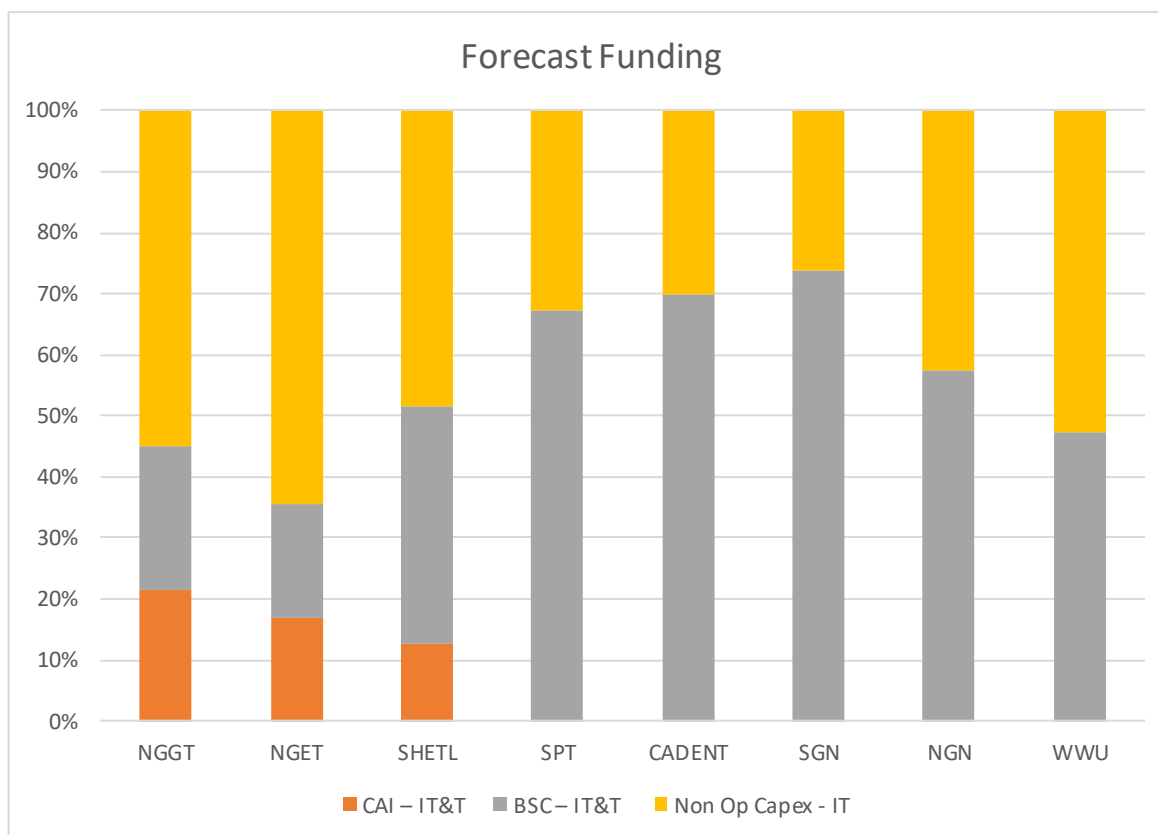


Figure 10-1 - Company CAI / BSC / Non-Op Capex Proportions requested funding

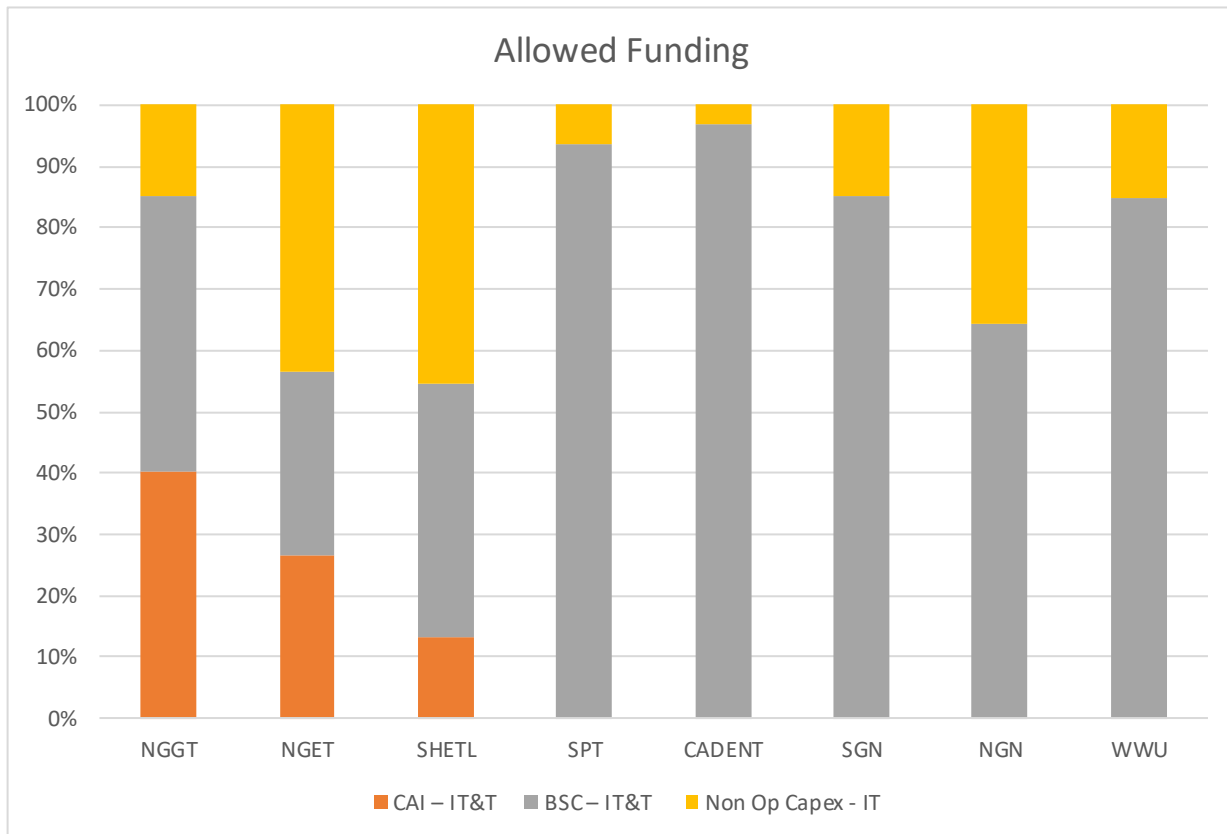


Figure 10-2 - Company CAI / BSC / Non-Op Capex Proportions of allowed funding

10.7. Forecast Cost Uncertainty

An issue encountered during the assessment of the network company's project cost forecasts is that many of the projects are at an early stage of their life cycle and, therefore, there is considerable uncertainty associated with the estimates. It is often the case that estimators build an element of contingency into their estimates, planning to 'err on the side of caution' and estimates of e.g. £x +50% / -10% are not uncommon. When 'pushed' to provide a single point estimate, the mid-point of the estimated range is often selected. As time progresses and the maturity of the design and procurement prices firm-up, the type of trend shown in Figure 10-3 may be observed whereby the reported 'single point estimate' of the forecast cost falls over time.

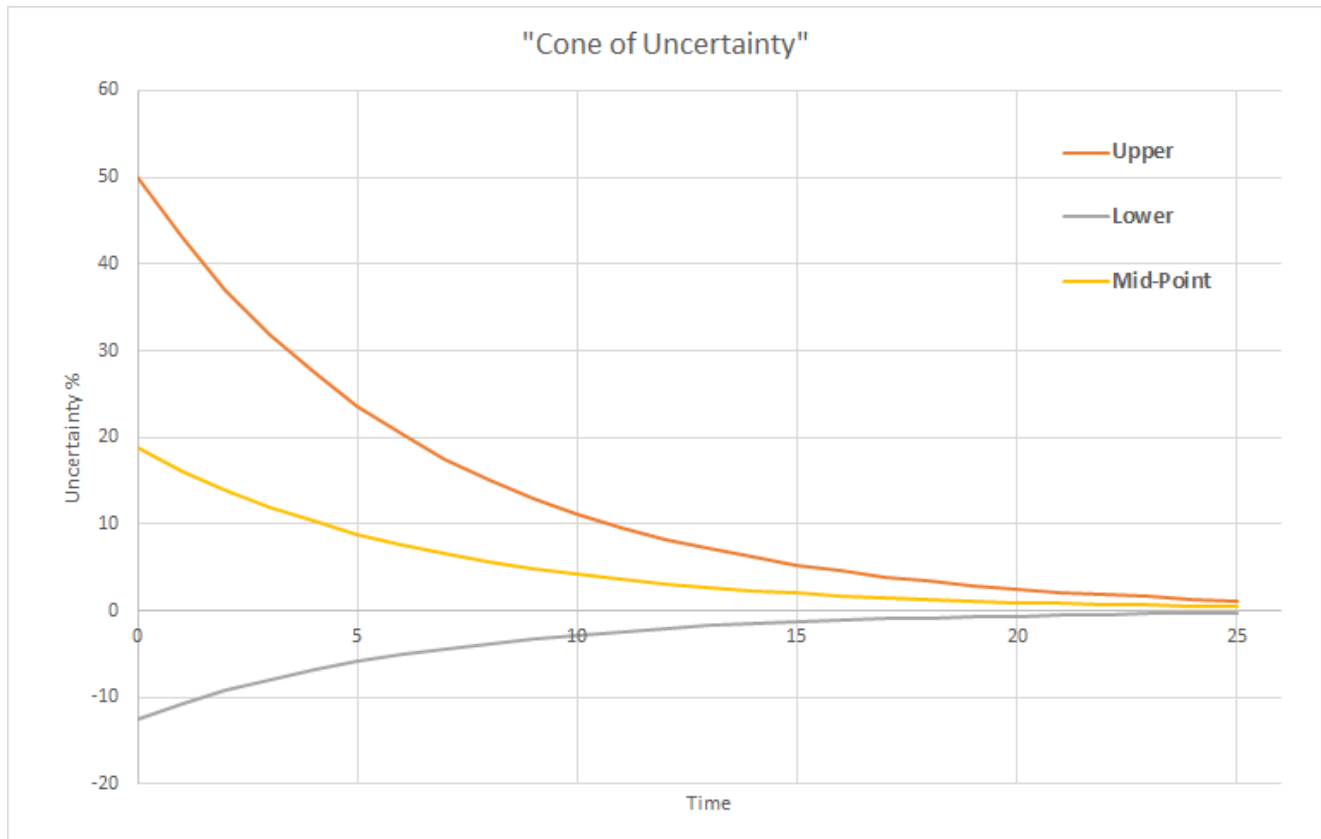


Figure 10-3 - Typical Estimate 'Cone of Uncertainty'

10.8. Optimism Bias

Her Majesty's Treasury (HMT) Green Book³ identifies and discusses what it terms 'Optimism Bias':

'Project appraisers have the tendency to be over optimistic. Explicit adjustments should therefore be made to the estimates of a project's costs, benefits and duration, which should be based on data from past or similar projects and adjusted for the unique characteristics of the project in hand.'

This guidance provides cost and time uplift percentages for generic project categories which should be used in the absence of more robust primary data.'

The treatment of Optimism Bias is occasionally included in the preparation of project and investment estimates as a factor that increases the forecast budget and project duration to reflect the inadequacies that may exist in the estimation process, often associated with the project definition and management, and Risk identification, capture and management processes. The Green Book Optimism Bias supplementary guidance provides a questionnaire that enables a factor appropriate to a project to be evaluated.

³ <https://www.gov.uk/government/publications/green-book-supplementary-guidance-optimism-bias>

Appendices

Appendix A. SQ Summary Log

A summary of the submitted SQ's are presented below.

For individual Q&A's, please refer to individual questions and answer sheets

Network	SQ	Atkins Date Submitted	Date submitted to Company	Days since submission / Days since return	Response Received	Date Response Received	Admin Status	Relevant ref / files on huddle
CAD	SQ1	31/01/20	07/02/2020	21	Yes	28/02/2020	Closed	CA11
CAD	SQ2	18/02/20	Not Submitted	n/a	n/a		n/a	
CAD	SQ3	18/02/20	21/02/2020	12	Yes	04/03/2020	Closed	CA13
CAD	SQ4	18/02/20	21/02/2020	12	Yes	04/03/2020	Closed	CA14
CAD	SQ5	18/02/20	21/02/2020	12	Yes	04/03/2020	Closed	CA15
CAD	SQ6	27/02/20	28/02/2020	11	Yes	10/03/2020	Closed	CA17
CAD	SQ7	27/02/20	28/02/2020	11	Yes	10/03/2020	Closed	CA18
CAD	SQ8	04/03/20	06/03/2020	10	Yes	16/03/2020	Closed	CA19
CAD	SQ9	04/03/20	06/03/2020	10	Yes	16/03/2020	Closed	CA20
CAD	SQ10	04/03/20	Not Submitted					
NGET	SQ1	31/01/20	06/02/2020	11	Yes	17/02/2020	Closed	NGET_SQ_CA_64, NGET_SQ_CA_64a_10 ET Direct AND Response is part of the NGGT SQ 88 response as agreed with Ofgem.
NGET	SQ2	06/02/20	07/02/2020	10	Yes	17/02/2020	Closed	NGET_SQ_CA_77, NGET_SQ_CA_77a
NGGT	SQ1	31/01/20	06/02/2020	11	Yes	17/02/2020	Closed	CA87 and CA88
NGGT	SQ2	31/01/20	Not Submitted	n/a	n/a	n/a	n/a	
NGGT	SQ3	13/02/20	21/02/2020	11	Yes	03/03/2020	Closed	CA95
NGGT	SQ4	13/02/20	21/02/2020	11	Yes	03/03/2020	Closed	CA94
NGGT	SQ5	27/02/20	29/02/2020	26	Yes	26/03/2020	Closed	CA123
NGGT	SQ6	27/02/20	29/02/2020	26	Yes	26/03/2020	Closed	CA121
NGGT	SQ7	27/02/20	29/02/2020	26	Yes	26/03/2020	Closed	CA122
NGN	SQ1	31/01/20	07/02/2020	19	Yes	26/02/2020	Closed	CA10
NGN	SQ2	06/02/20	07/02/2020	19	Yes	26/02/2020	Closed	CA12
SGN	SQ1	31/01/20	Not Submitted	n/a	n/a	n/a	n/a	CA5
SGN	SQ2	31/01/20	07/02/2020	12	Yes	19/02/2020	Closed	SGN IT&T 1 to 8, SGN IT&T 9 14 16
SHET	SQ1	31/01/20	06/02/2020	11	Yes	17/02/2020	Closed	CA48 and CA49
SHET	SQ2	07/02/20	14/02/2020	12	Yes	26/02/2020	Closed	CA_55
SPT	SQ1	31/01/20	06/02/2020	11	Yes	17/02/2020	Closed	CA26 and CA27
SPT	SQ2	06/02/20	07/02/2020	10	Yes	17/02/2020	Closed	CA31
SPT	SQ3	21/02/20	21/02/2020	10	Yes	02/03/2020	Closed	CA35
WWU	SQ1	31/01/20	07/02/2020	21	Yes	28/02/2020	Closed	CA11 and CA11(2)
WWU	SQ2	06/02/20	07/02/2020	32	Yes	10/03/2020	Closed	CA13, 5 files

Appendix B. Supplementary Questions

B.1. NGET

B.1.1. SQ1

Reference number	NGET_SQ_CA_64
Network Company	NGET
Topic/Activity:	BPDT D4.3a
Question:	<p>To validate the costs proposed for the IT projects and initiatives identified within the business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed IT project in the business plan:</p> <p>a. A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan; A description of the intended project outcomes i.e. what it functionally delivers; A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN; The identification of any activities dependent upon this project i.e. what else does this project enable; The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; A work breakdown structure for this project delivery; Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project ; The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs.</p> <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p>

B.1.2. SQ2

Reference number	NGET_SQ_CA_77
Network Company	NGET
Topic/Activity:	Cost Assessment / NGET IT & Cyber Security Strategy
Question:	<p>To assess the validity & costs of the proposed IT & Cyber Security projects within the NGET business plan, visibility is required of the scope and plan for the delivery and sustainment of the project. We therefore request the following:</p> <p>Please provide your high level overall programme plan that clearly evidences the interdependencies and timescales of each project within the programme</p> <p>Costs of training – including cultural and operational change practice; specific training for specific software systems</p> <p>Provide an insight to the internal stakeholder communications plan – to ensure understanding of the need for change and the individual roles required to implement the required change</p> <p>Provide detailed risks & risk mitigation strategy including RAID analysis across all IT & Cyber security projects and activities to deliver the strategic objectives</p> <p>The Table on P6 of the NGET 14.07 ET IT Investment Annex details a number of investment activities. Please rank these in order of priority - for example, activities essential to deliver the strategic objectives to activities that are nice to have, but which do not impact materially on delivering success of the strategic objectives.</p> <p>Provide risk analysis across all of those activities in Q5 above, highlighting project (activity) interdependencies and mitigation for individual activity failures on overall success</p> <p>Significant additional spend on cyber security is identified with a lack of clarity to justify this increase in terms of human resource, business process, hardware & software required. Please provide this detail.</p>

	<p>NGET A 10.03 mentions a need to uplift existing cyber expertise. Detail how this will be achieved, including mitigation strategies to compensate for the length of time required for necessary training</p> <p>EDI makes little or no mention of disability inclusion. Provide details.</p> <p>What support arrangements are in place for legacy platforms, hardware and software during BAU and transition to future business to maintain critical operations?</p> <p>Provide detail on the costs, time and resource required for testing and piloting new technologies and business practices</p> <p>P8 Gartner report mentions use of algorithms. Where will these be sourced?</p> <p>Provide details of your data interoperability strategy and costs</p> <p>NGET A 14.08 P.12 mentions increase use of IT to improve flexibility. Please detail the resultant costs savings in office space and equipment</p> <p>P20. What steps are taken to mitigate unnecessary upgrades demanded by providers?</p> <p>Whilst it is recognised that this is a significant list, it is assumed that the analyses have been conducted to enable the high-level business plan and that the information will be readily available for assessment.</p>
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B.2. NGGT

B.2.1. SQ1

Reference number	NGGT_SQ_CA_87
Network Company	NGGT
Topic/Activity:	2.09_IT_&_Telecom_Gp, 2.10_IT_&_Telecom_Alloc 2.07_Bus_Support_Gp, 2.08_Bus_Support_Alloc 2.02_Cash_Contr_Costs
Question:	<p>To validate the costs proposed for the IT projects and initiatives identified within the business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed IT project in the business plan:</p> <p>A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan;</p> <p>A description of the intended project outcomes i.e. what it functionally delivers;</p> <p>A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills;</p> <p>The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN;</p> <p>The identification of any activities dependent upon this project i.e. what else does this project enable;</p> <p>The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; g. A work breakdown structure for this project delivery;</p> <p>Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs;</p> <p>A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project ;</p> <p>The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs.</p>

	There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.
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Reference number	NGGT_SQ_CA_88
Network Company	NGGT
Topic/Activity:	2.09_IT_&_Telecom_Gp, 2.10_IT_&_Telecom_Alloc 2.07_Bus_Support_Gp, 2.08_Bus_Support_Alloc 2.02_Cash_Contr_Costs
Question:	Relating to NGGT_SQ_CA_87, there is also a need to validate any (non) operational IT cost data contained in the BPDt for the tables listed (i.e. 2.09_IT_&_Telecom_Gp, 2.10_IT_&_Telecom_Alloc, 2.07_Bus_Support_Gp, 2.08_Bus_Support_Alloc as well as TO & SO IT Operational IT & Telecoms in CAI and Business Support within 2.02_Cash_Contr_Costs). Please provide the background and underpinning data from which the numbers in these sheets have been derived. The information provided should be set out in such a fashion as to contextualise the running costs of the IT function & infrastructure to assist in our benchmarking process.

B.2.2. SQ3

Reference number	NGGT_SQ_CA_95
Network Company	NGGT
Topic/Activity:	Cost assessment
Question:	<p>This question relates to:</p> <p>Part 1 “Executive Summary” of National Grid Gas Transmission’s Business Plan 2021-26</p> <p>Part 9 “Track Record in RIIO-1” of National Grid Gas Transmission’s Business Plan 2021-26</p> <p>Section 11 “Efficient Delivery” of National Grid’s IT Strategy December 2019 supplied in Annex A20.22</p> <p>Section 1 “Executive Summary” and Section 4 “How We Deliver RIIO-2 Plan” of National Grid Gas Transmission Information Technology Investment Plan supplied in Annex A20.03 In Section 9 “Track Record in RIIO-1” (p23) you refer to the increases in cost of TO Non-operational capex of £55m which were caused by three IT initiatives:</p> <p>Project One – to replace your existing enterprise resource planning system</p> <p>Programme relating to Asset Data Enhancement</p> <p>An initiative to replace and enhance core asset management systems</p> <p>You identify that this overspend was caused by unforeseen needs for additional work to enhance these systems and meet your requirements.</p> <p>Have you identified the root causes of these issues?</p> <p>How have you addressed these root causes?</p> <p>In addition to these identified issues in RIIO-1, in Section 11 “Efficient Delivery” (p34-35), you identify a key risk to achieving your IT Strategy as:</p> <p>Risk: The business does not have the capacity to deliver</p> <p>Description: While called IT projects, many of the initiatives will require significant business involvement. This was well recognized in major T1 change initiatives where dedicated business teams were assigned to achieve these critical programs. Planned initiatives detailed in the strategy document will require similar dedication from the business functions for multiple years.</p> <p>Mitigation: monitor the impact of driving efficiency in the UK on the ability of allocated resources to meet the appetite for new business initiatives across the UK Business. To meet the UK plan we are looking at driving significant efficiency gains annually for the</p>

	<p>remainder of T1. To achieve [sic], we must make choices on business demand and level of service.</p> <p>Equally, in Section 11 (p34), you refer to your “end to end delivery governance process” and in Section 4 (p75) you refer to your approaches to Portfolio Planning (p75) , Bimodal Delivery (p76) and Change Delivery (p77) iii. Is your “end to end delivery governance process” the same as the frameworks referred to in Section 4. If not, what is this process and please supply details of how it works with these other frameworks?</p> <p>iv. Does this process reflect the lessons learned on issues and successes relating to delivery of IT initiatives in RIIO-1 (as identified above)?</p> <p>In Section 1 “Executive Summary” of National Grid Gas Transmission Information Technology Investment Plan (p3) you summarise that you plan to spend £180.1m into IT systems and capabilities representing a significant increase in RIIO-1 plans. In the context of this significant increase in delivery of IT related projects over RIIO-2, your delivery framework needs to be of sufficient quality to ensure there are not similar levels of overspend on IT projects in RIIO-2 as experienced in RIIO-1. In Section 9 “Track Record in RIIO-1” (p23) you refer to the increases in cost of TO Non-operational capex of £55m which were caused by three IT initiatives:</p> <p>Project One – to replace your existing enterprise resource planning system</p> <p>Programme relating to Asset Data Enhancement</p> <p>An initiative to replace and enhance core asset management systems</p> <p>You identify that this overspend was caused by unforeseen needs for additional work to enhance these systems and meet your requirements.</p> <p>i. Have you identified the root causes of these issues?</p> <p>ii. How have you addressed these root causes?</p>
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B.2.3. SQ4

Reference number	NGGT_SQ_CA_94
Network Company	NGGT
Topic/Activity:	Cost assessment
Question:	<p>This question relates to the details of National Grid's IT Operating Model supplied in Annex A20.22 IT Strategy December 2019, in Section 4.4 "Our IT Operating Model and Culture" and separately in Section 10 "IT Operating Model" and Section 11 "Efficient Delivery". From these sections you are planning to</p> <ul style="list-style-type: none"> "implement an Enterprise Strategic Planning with Business Architecture as a core deliverable of this office under the UK transformation office" (p13) "Expand ngDigital labs" (p13) <p>continue to enhance the revised governance model for Architecture Governance through implementing agile architecture methodologies and processes (p35).</p> <p>In relation to these plans:</p> <ul style="list-style-type: none"> i. When are you planning to deliver these organisational changes? If they fall within the RIIO-2 period: <ul style="list-style-type: none"> how will they be delivered and how are they accounted for in your submission? Have you reflected the period of disruption these organisational changes will cause to your IT teams and their internal and external customers? How will you mitigate this disruption? ii. Are there any other planned changes to your IT Operating Model that are not covered by the above initiatives? If so, please supply details of: <ul style="list-style-type: none"> their timing; and if they fall within the RIIO-2 period: their impacts and how they are accounted for in your submission iii. Is delivery of your RIIO-2 portfolio of works dependent on successful implementation of this IT Operating Model and the enhanced capabilities it will provided for NGGT?

B.2.4. SQ5

Reference number	NGGT_SQ_CA_123
Network Company	NGGT
Topic/Activity:	Cost assessment
Question:	<p>This question relates to Annex A20.03 IT Investment Plan: - In section 4.2.1 Portfolio Planning, you outline your approaches to portfolio prioritisation. Q1. Please supply some example outputs of the portfolio prioritisation process (e.g. Portfolio Strategy; Prioritised list of initiatives; etc.) Q2. You state that benefits of initiatives are assessed as part of this prioritisation – please provide any documentation relating to your benefits management approaches and a worked example for a project/programme</p> <p>Relates to submission from KT SQ 108-110</p>

B.2.5. SQ6

Reference number	NGGT_SQ_CA_121
Network Company	NGGT
Topic/Activity:	Cost assessment
Question:	<p>This question relates to Annex A20.22 IT Strategy.</p> <p>- In section 11.1 Sanctioning and Sequencing Investments, on p34 you cite a key risk to achieving your plan as IT not having capacity to delivery</p> <p>Q1. Have you assessed how much capacity is required to delivery your RIIO-2 plans?</p> <p>Q2. Have you estimated how much capacity will draw on internal and external resources?</p> <p>Q3. Do you have sufficient internal resources to deliver your RIIO-2 plans?</p> <p>Q4. Do you have sufficient routes to sourcing any external resources required?</p> <p>Relates to submission from KT SQ 108-110</p>

B.2.6. SQ7

Reference number	NGGT_SQ_CA_122
Network Company	NGGT
Topic/Activity:	Cost assessment
Question:	<p>This question relates to Annex A20.22 IT Strategy.</p> <p>- In section 4.2 Key Pillars of the T2 Strategy, you state a need to upskill staff which will achieved via your YouConnect Upgrade/Refresh</p> <p>Q1. Please provide further details of what YouConnect is</p> <p>Q2. Please provide further details of the proposed Upgrade/Refresh and associated costs</p> <p>Q3. Please provide details of the impact on upskilling staff is this Upgrade/Refresh were not delivered</p> <p>Q4. Will this proposed Upgrade/Refresh incorporate training to address additional training needs brought about by your RIIO-2 plans?</p> <p>Relates to submission from KT SQ 108-110</p>

B.3. SPT

B.3.1. SQ1

Reference number	5194614_ITTEL_SPT_SQ1
Network Company	SPT
Topic/Activity:	SPT Cost Validation
Question:	<p>The reference file contains BPDT template sheets D4.3a, D4.5 and D4.6.</p> <p>Q1. To validate the costs proposed for the projects and initiatives identified within the SPT business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed project in the SPT business plan:</p> <ol style="list-style-type: none"> A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan; A description of the intended project outcomes i.e. what it functionally delivers; A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN; The identification of any activities dependent upon this project i.e. what else does this project enable; The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; A work breakdown structure for this project delivery; Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project e.g. x meters of cabling @ £y / meter; The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs.

	<p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p> <p>Q2. Please supply the BPDT and CBA workbook(s).</p> <p>It is assumed that the analyses have been conducted to enable the high-level business plan and that the information will be readily available for assessment.</p> <p>Q3. There is also a need to validate any operational cost data contained in the BPDT. Please provide the background and underpinning data from which the numbers in these sheets have been derived.</p> <p>Q4. Please provide the passwords required to unprotect the worksheets within the provided BPDT and CBA workbooks.</p>
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B.3.2. SQ2

Reference number	SPTL_SQ_CA_31
Network Company	SPTL
Topic/Activity:	Cost Assessment – SP IT & Strategy
Question:	<p>To assess the validity & costs of the proposed IT & Cyber Security projects within the SPT business plan, visibility is required of the scope and plan for the delivery and sustainment of the project. We therefore request the following:</p> <ol style="list-style-type: none"> 1. Please provide your high-level overall programme plan that clearly evidences the interdependencies and timescales of each IT, Cyber and workforce projects to deliver your stated strategic objectives, mentioned in Appendix A24 Business IT security plan 2. Rank these projects in terms of delivering your strategic objectives. From Absolutely essential (where the strategic objectives will not be realised if a project does not proceed) to nice to have (where the strategic objectives will be realised, possibly not as fully as desired if a particular project does not proceed) 3. Appendix A24 Business IT security plan 1.0 Introduction states your business partnership with Iberdrola, a Spanish organisation. Though we appreciate that post Brexit arrangements are yet to be determined, please provide detail of your risk assessment and mitigation plans in the context of IT security. 4. No mention of data interoperability options to reduce reliance on proprietary/supplier diverse systems. What reason for not exploring this as an option? 5. What is your business as usual budget spend for hardware and software refresh/update/training? 6. Costs of training – including cultural and operational change practice and specific training for specific software systems. Provide evidence that these costs have been considered and included in your assumptions 7. Provide an insight to the internal stakeholder/staff communications plan with reference to the communications programme required to accommodate your proposed changed business practices 8. What steps are taken to mitigate unnecessary hardware/software upgrades demanded by suppliers? 9. Provide evidence of scenario planning – eg best case, worst case and unimaginable case including cost and workforce implications, risk management and mitigation for the proposed IT programme. <p>Whilst it is recognised that this is a significant list, it is assumed that the analyses have been conducted to enable the high-level</p>

	business plan and that the information will be readily available for assessment.
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B.3.3. SQ3

Reference number	SPTL_SQ_CA_35
Network Company	SPTL
Topic/Activity:	Cost Assessment
Question:	<p>The response to Supplementary Question SPTL_SQ_CA_26 provided a high level view of much of the information requested by that SQ.</p> <p>The underlying purpose of the SQ is to enable Atkins to gain confidence in the validity of the cost estimates for the proposed IT and Telecoms projects and initiatives provided by SPT. This confidence is underpinned by the technical plans that explain how the project outcomes will be realised.</p> <p>It is recognised that some projects may be in an early phase of their life cycle and that a detailed technical breakdown of the project may not be available. However, what is sought is visibility of the methodology, modelling framework and populating data employed to develop the presented cost estimates.</p> <hr/> <p>For each proposed project in the SPT business plan please provide the following information for each project:</p> <ul style="list-style-type: none"> a. A description of the proposed solution including system architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; b. A work breakdown structure delivery at a level commensurate with the project life cycle and maturity; c. Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; d. A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future vendors'/contractor prices and the scale of the project e.g. x meters of cabling @ £y / meter; e. The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs. <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p>

B.4. SHET

B.4.1. SQ1

Reference number	SHETL_SQ_CA_48
Network Company	SHET
Topic/Activity:	BPDT – Table D4.3a Non Op Capex Scheme Summary
Question:	<p>To validate the costs proposed for the IT projects and initiatives identified within the business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed IT project in the business plan:</p> <p>A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan;</p> <p>A description of the intended project outcomes i.e. what it functionally delivers;</p> <p>A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills;</p> <p>The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN;</p> <p>The identification of any activities dependent upon this project i.e. what else does this project enable;</p> <p>The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones;</p> <p>A work breakdown structure for this project delivery;</p> <p>Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs;</p> <p>A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project ;</p> <p>The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs.</p> <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p>

B.4.2. SQ2

Reference number	5194614_ITTEL_SHET_SQ2
Network Company	SHET
Topic/Activity:	SHET – Business plan review
Question:	<p>To validate the proposed IT projects, initiatives and costs identified within the SHET business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of the project. This includes:</p> <p>Connections Case Management</p> <ol style="list-style-type: none"> 1. You point out in Section 5.3 that the full connections case management project is an extension/upgrade of the tactical connections database that was implemented in RIIO-T1. Given that the connections case management is forecast to cost £2.00m; how much did the tactical connections database cost in RIIO-T1? What additional benefit will this increased investment produce and how do they facilitate the success of your strategy? What specific technologies will be used as part of the full connections case management solution? <p>MDM & Data Lake</p> <ol style="list-style-type: none"> 1. Can you please provide relevant examples from the ENA Data Group, Energy Taskforce and Digital Strategy that support the need to invest in section 6.3 of the investment plan? 2. In section 6.3 you claim that the aim of your Master Data management and Data Lake is to have an overall portal that supports your RIIO-T2 objects. Can you state how the project will meet your RIIO-T2 objectives? 3. How will you measure the improvement of data as a result of the project outlined in section 6.3? <p>Transmission Universal Info</p> <ol style="list-style-type: none"> 1. In section 5.6 you state “we will build a system that allows interaction with data from all core applications via a touch screen facility”. What specific technologies will you use to build this system and why are they “a cornerstone” to your digital strategy? How does the project cost of £5.84m justify the implementation of this system? How does this new system support the current IT strategy and what gaps does it address?

Data Enrichment Analytics

1. In section 6.4 you claim that “having a copy of data in a centralised store will enable us to deliver a number of the recommendations of the Energy Data Taskforce strategy”. What are the specific recommendations of this strategy that your Data Enrichment Analytics projects will help you meet and how does meeting these recommendations support your IT strategy?
2. In section 6.4 you “propose to use Advanced Analytics including Artificial Intelligence tools to provide the necessary insights”. What specific AI tools are you referring to here and how much will they cost? How does the implementation of AI address gaps in your IT strategy?

Smart Monitoring

1. In section 6.5 you state “Smart Monitoring will build on our RIIO-T1 Condition Based Risk Management (CBRM) tool, to further ensure assets are only replaced at end of life, but before they have an adverse effect on our Network Asset Risk Metric (NARM)”. Can you explicitly state what additional technologies will be input into Smart Monitoring and how they improve the original CBRM tool to justify the additional investment? How do these improvements fill gaps in your IT strategy?

Linear Assets – Underground Sub Sea Cables

1. In section 6.6 you point out that your “proposed system will include the necessary tools for recording, assessing and viewing this information, and linking the information to our existing core applications”. How does linking the information to your core systems support a gap in your current systems and how does this align with your IT strategy? What are the necessary tools you are referring to? Please breakdown the costs of the investment to explain how the linking of systems will evoke strategic benefit?

BIM

1. In section 6.7 you reference a paper by PWC stating the benefits of BIM level 2. You also point towards the fact that “national Grid have reported significant savings in their capital programme through the use of BIM’. Can you

	<p>explicitly state the benefits SHET specifically will accrue from this project and how they support your strategy? Please breakdown the investment into more detail outlining what components of BIM require what investment? Can you give detail on how you came to a benefits analysis of £18.17m?</p> <p>Investment Optimisation</p> <ol style="list-style-type: none"> 1. In section 6.10 you claim that “some of these tools will be within our Operational Technology Control Systems area, however additional information, such as the current health of individual assets, is needed to build a holistic view of the whole network”. What specific tools are you referring to and how much do they cost? What is the reason for this investment and how does it support your IT strategy? 2. Whilst it is recognised that this is a significant list, it is assumed that the analyses have been conducted to enable the high-level business plan and that the information will be readily available for assessment.
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B.5. SGN

B.5.1. SQ2

Reference number	5194614_ITTEL_SGN_SQ2
Network Company	SGN
Topic/Activity:	SGN Cost Validation
Question:	<p>Q1. To validate the costs proposed for the projects and initiatives identified within the SGN business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed project in the SGN business plan:</p> <ol style="list-style-type: none"> A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan; A description of the intended project outcomes i.e. what it functionally delivers; A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN; The identification of any activities dependent upon this project i.e. what else does this project enable; The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; A work breakdown structure for this project delivery; Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project e.g. x meters of cabling @ £y / meter; The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs. <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p>

	<p>Q2. Please supply the BPDT and CBA workbook(s).</p> <p>It is assumed that the analyses have been conducted to enable the high-level business plan and that the information will be readily available for assessment.</p> <p>Q3. There is also a need to validate any operational cost data contained in the BPDT. Please provide the background and underpinning data from which the numbers in these sheets have been derived.</p>
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B.6. NGN

B.6.1. SQ1

SQ Reference number	NGN_SQ_CA_10
Network	NGN
Topic/Activity:	Capex – Technology & Systems
Question:	<p>To validate the costs proposed for the IT projects and initiatives identified within the business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed IT project in the business plan:</p> <ol style="list-style-type: none"> A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan; A description of the intended project outcomes i.e. what it functionally delivers; A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN; The identification of any activities dependent upon this project i.e. what else does this project enable; The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; A work breakdown structure for this project delivery; Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project; The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs. <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p>

B.6.2. SQ2

SQ Reference number	NGN_SQ_CA_12
Network	NGN
Topic/Activity:	Capex – Technology & Systems
Question:	<p>To validate the proposed IT projects, initiatives and costs identified within the NGN business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of the project. This includes:</p> <ol style="list-style-type: none"> 1. P76 of your Business Plan quotes £13m totex to deliver your strategic objectives in terms of Cyber resilience and business IT. Significant changes to the business practice were made in RIIO1, particularly the move from outsourced IT contracts to 3iG mentioned in A12 NGN Digitalisation strategy. It is unclear what further changes justify the £13m. Please provide high level plans detailing further changes and include RAID and risk mitigation analysis. 2. What is your business as usual budget spend for hardware and software refresh/update/training. 3. There is no mention of data interoperability options to reduce reliance on proprietary/supplier diverse systems. What is your reason for not exploring this as an option? 4. What steps are taken to mitigate unnecessary hardware/software upgrades demanded by suppliers? 5. Please provide evidence of scenario planning – e.g. best case, worst case including cost and workforce implications, risk management and mitigation. <p>Whilst it is recognised that this is a significant list, it is assumed that the analyses have been conducted to enable the high-level business plan and that the information will be readily available for assessment.</p>

B.7. Cadent

B.7.1. SQ1

SQ Reference number	CADENT_SQ_CA_11
Network	All
Topic/Activity:	BPDT
Question:	<p>"To validate the costs proposed for the IT projects and initiatives identified within the business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed IT project in the business plan:</p> <ul style="list-style-type: none"> a. A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan; b. A description of the intended project outcomes i.e. what it functionally delivers; c. A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; d. The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN; e. The identification of any activities dependent upon this project i.e. what else does this project enable; f. The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; g. A work breakdown structure for this project delivery; h. Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; i. A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project; j. The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs. <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan."</p>

B.7.2. SQ3

SQ Reference number	CADENT_SQ_CA_13
Network	All
Topic/Activity:	
Question:	<p>"This question relates to Appendix 09.30 Technology:</p> <ul style="list-style-type: none"> - In section 1 (p2), you identify that your plans for RIIO-2 in relation to your IS Operating Model require £7.5m capex; - In section 6.5 (p14-15), you describe the current IS Operating Model; - In section 7.5 (p20), under the title "IS Framework and Efficiency" (which we have assumed should say "IS Operating Model" as per the table 5 above), you outline that your plans for RIIO-2 consist of retendering "contracts for applications development, applications maintenance, service management integration, cyber security operations and printing during RIIO-2." <p>Q1: Is this the full extent of your plans relating to your IS Operating Model in RIIO-2? If not, please supply details of other initiatives that make up the £7.5m capex</p> <p>Q2: there are mentions made in Appendix 09.30 Technology to other operating model changes (delivery partner operating model – p12; customer centric operating model – p13;) and there are numerous mentions in your full RIIO-2 business plan to moving from a process-centric operating model to a depot-centric/customer-centric operating model. These changes are unlikely to occur in isolation of your IT&T so will these plans require any changes to your IS Operating Model and if so, how will you accommodate these changes?"</p>

B.7.3. SQ4

SQ Reference number	CADENT_SQ_CA_14
Network	All
Topic/Activity:	
Question:	<p>"This question relates to Appendix 09.30 Technology:</p> <p>In section 10.2.2 (p32) you identify that your proposed option will realise efficiency savings of £3.6m per year over the longer-term and ramped up through RIIO-2</p> <p>Q1. How will these and other identified efficiencies be managed and sustained?</p> <p>Q2. Do you have an organisational benefits management approach that will be used for this activity?"</p>

B.7.4. SQ5

SQ Reference number	CADENT_SQ_CA_15
Network	All
Topic/Activity:	
Question:	<p>"This question relates to Appendix 09.30 Technology:</p> <ul style="list-style-type: none"> - In section 8.3 (p22), you identify a project related to a Digital Twin and outline the rationale for this project - In section 8.4 (p23), you outline your plan to fully fund this project, with £2.99m <p>Q1: What is the scope of this project and how will the £2.99m be used for this project?</p> <p>Q2: What level of maturity of digital twin are you intending to implement as the output of this project (e.g. using the Institute of Engineering and Technology (IET)'s Digital Twin Maturity Spectrum)?</p> <p>Q3: Are any initiatives (projects or programmes) or efficiencies identified in your RIIO-2 plan dependent on successful implementation of this Digital Twin?"</p>

B.7.5. SQ6

SQ Reference number	CADENT_SQ_CA_17
Network	All
Topic/Activity:	Business Plan Narrative
Question:	<p>"This question relates to RIIO-2 Business Plan:</p> <ul style="list-style-type: none"> - In Section 9: Costs and Efficiencies, you identify in figure 09.03: Our Updated Contracting Strategy that you will outsource the majority of your RIIO-2 Programme Management and Delivery but will keep Work Selection in-house - In Section 8: Driving Performance through innovation and competition, there are repeated references to your Change Management Framework and how it defines or works with project management, programme management, portfolio management, benefits management approaches <p>Q1. Please provide a copy of your Change Management Framework and an example of some collateral (plan; risk log; benefit register; etc.) for an initiative that is being or was delivered using this framework</p> <p>Q2. Please outline the Work Selection processes that will be used for IT + Technology projects and whether this is analogous to the cited portfolio management processes</p> <p>Q3. What processes do you have in place or planned to ensure your outsourced programme management and delivery suppliers will adhere to these approaches to meet your organisational standards?"</p>

B.7.6. SQ7

SQ Reference number	CADENT_SQ_CA_18
Network	All
Topic/Activity:	Business Plan Narrative
Question:	<p>"This question relates to Appendix 09.30 Technology:</p> <p>- In section 6.5 IS Operating Model (p15), you show the chosen IT Sourcing Model as using key strategic partners.</p> <p>Q1. What was the rationale for choosing this model against the others cited?</p> <p>Q2. How will you manage the lack of competition inherent in this model (for example by comparison to the cited option of using interlinked strategic partners)?"</p>

B.7.7. SQ8

SQ Reference number	CADENT_SQ_CA_19
Network	All
Topic/Activity:	Business Plan Narrative
Question:	<p>"This question relates to Appendix 09.30 Technology:</p> <ul style="list-style-type: none"> - In section 8.3 (p22), you identify a project related to The Internet of Things and outline very briefly the rationale for this project which is expanded further on p23 in terms of its benefits - In section 8.4 (p23), you outline your plan to fully fund this project, with £2.84m <p>Q1: Please provide more information on the scope of the project to inform our analysis.</p> <p>"</p>

B.7.8. SQ9

SQ Reference number	CADENT_SQ_CA_20
Network	All
Topic/Activity:	other
Question:	<p>"In response to SQ_CA_11, a copy of Cadent's Solution Delivery Framework (SDF) was provided to explain how the proposed projects will be delivered. The stage gate process laid out, based on PRINCE2 best practice, is usually well suited to Waterfall delivery but must be adapted to be used well for Agile delivery.</p> <p>Q1: Does Cadent use waterfall, agile and blended delivery methods?</p> <p>Q2: Is the SDF used for governance of projects using Agile or blended techniques?</p> <p>Q3: Has it been modified for use with agile/blended projects and/or is additional guidance provided for the adoption of the SDF in line with agile techniques?</p> <p>"</p>

B.8. WWU

B.8.1. SQ1

SQ Reference number	WWU_SQ_CA_11
Network	Wales & West Utilities
Topic/Activity:	Cost Assessment
Question:	<p>To validate the costs proposed for the IT projects and initiatives identified within the business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of each proposed project. We therefore request for each proposed IT project in the business plan:</p> <ul style="list-style-type: none"> a. A description of the context for the proposed project e.g. it's contribution to 1 or more strategic themes described in the business plan; b. A description of the intended project outcomes i.e. what it functionally delivers; c. A definition of the proposed solution including architecture, new hardware and software components and any additional resources needed e.g. facilities and skills; d. The identification of any activities upon which this project is dependent i.e. the provision and maintenance of a WAN; e. The identification of any activities dependent upon this project i.e. what else does this project enable; f. The plan for project execution i.e. a schedule showing when significant activities will occur for this project e.g. milestones; g. A work breakdown structure for this project delivery; h. Top ranked risks and opportunities with pre and post mitigation probabilities of occurrence, impact and costs, and including mitigation costs; i. A build-up of the costs based on transparent calculations underpinned by cost forecasts based on, for example, historical cost data or future supplier/contractor prices and the scale of the project ; j. The resources (manpower, facilities, spares, etc.) required to operate and sustain the project deliverables during the RIIO-2 period and beyond i.e. forecast asset reliability, obsolescence and technical refresh frequency and costs. <p>There must be transparency and consistency from the basic cost and scaling data through the CBA, if undertaken, to the overarching business plan.</p>

B.8.2. SQ2

SQ Reference number	WWU_SQ_CA_13
Network	Wales and West Utilities
Topic/Activity:	IT Projects
Question:	<p>To validate the proposed IT & Cyber Security projects, initiatives and costs identified within the WWU business plan, detailed visibility is required of the scope and plan for the delivery and sustainment of the project. We therefore request the following:</p> <ol style="list-style-type: none"> 1. Please provide your high-level overall programme plan that clearly evidences the interdependencies and timescales of each IT, Cyber and workforce projects mentioned in Chapters 19,20 & 21 of your business plan that deliver your stated strategic objectives. 2. Please rank projects in terms of delivering your strategic objectives. From absolutely essential (where the strategic objectives will not be realised if a particular project does not proceed) to nice to have (where the strategic objectives will be realised, possibly not as fully as desired if a particular project does not proceed). 3. Chapter 12 (j) notes £5-£10 m per annum to ensure workforce resilience. Please provide high level plans to justify this spend – in terms of training, business practice changes and upskilling investment. 4. What is your business as usual budget spend for hardware and software refresh/update/training? 5. Chapter 19 P182 notes the need for specific skills (e.g. data scientists). Chapter 21 .4 notes challenges in recruiting and retaining IT specialists with cyber skills. Please provide the risk mitigation strategy. 6. Chapter 21 mentions building a vigilant workforce, how will this be achieved? 7. Please provide risk mitigation plan on operator errors and accidental failures mentioned in Chapter 21. 8. Page 190 mentions your diverse supply chain. Please provide detail on your data interoperability strategy and RAID analysis. 9. With reference to Page 192 (Prevent), please provide details of your training plans and costs. 10. Your definition of cyber security lacks detail in terms of hardware, software, staff resource (skills & levels), training and communication costs. Acknowledging commercial in confidence considerations, please provide high level plans to evidence RAID and gap analysis reports. 11. Costs of training – including cultural and operational change practice and specific training for specific software systems. Provide evidence that these costs have been considered and included in your assumptions. 12. Provide a detailed internal stakeholder/staff communications plan with reference to the communications programme required to accommodate your proposed move to the cloud – (Chapter 21, P192) 13. What support arrangements are in place for legacy platforms, hardware and software during BAU and transition to future business to maintain critical operations? 14. Provide detail on the costs, time and resource required for testing and piloting new technologies and business practices. 15. Provide details of staff learning and training costs in this cultural change programme (current practice to future practice, noted in chapters 19, 20 & 21 of your business plan). 16. Provide details of your data interoperability strategy and costs. 17. What steps are taken to mitigate unnecessary hardware/software upgrades demanded by providers?

	<p>18. Provide risk analysis across all projects highlighting project interdependencies and mitigation for individual activity failures on overall success.</p> <p>19. Significant additional spend on cyber security is identified with a lack of clarity to justify this increase in terms of human resource, business process, hardware & software required. Please provide this detail.</p> <p>20. Provide costs detail to reflect changing NIS requirements.</p> <p>21. SAAS costs document has been fully redacted. Please provide high level detail of how you propose to move from BAU to transformation projects.</p> <p>22. Provide detail of your governance arrangements and risk assessment</p> <p>23. Provide evidence of scenario planning – e.g. best case, worst case including cost and workforce implications, risk management and mitigation.</p> <p>Whilst it is recognised that this is a significant list, it is assumed that the analyses have been conducted to enable the high-level business plan and that the information will be readily available for assessment.</p>
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