Major Justification Paper: MJP01

Capacity Upgrades

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Summary Table

Name of Project	Capacity Upgrades
Programme reference	MJP01
Primary Investment Driver	Licence obligation
Project Initiation Year	MJP Inception date: 2027
Project Close Out Year	Ultimate project completion date: 2031
Total Installed cost estimate (£)	[cost data]
Cost Estimate accuracy (%)	+/- 10%
Project Spend to date (£)	[cost data]
Current Project Stage Gate	Rolling program of investment
Reporting Table Ref	5.01 LTS Storage & Entry
Outputs included in RIIO-3 Business Plan	Yes
Spend apportionment (for RIIO-3 plan)	[cost data]
Proposed regulatory treatment for RIIO-3 workplan	**PCD** (price control deliverable). We deem it is reasonable to recommend this regulatory treatment as this investment is needed for legislative compliance and must be delivered.

Table 1: Summary table

Note: Unless otherwise stated, all prices are pre-efficiency and are in a 23/24 price base throughout this document.

This investment case does not satisfy the criteria for late competition or early competition and pursuing these activities would not be in the interests of the customer. We recognise the benefits that competition can bring to customers through efficiency and innovation. We continue to challenge ourselves as a business to ensure that we are harnessing competitive forces where they can provide these benefits. For specific detail on how we have assessed competition, please see Chapter 6 of the Workforce and Supply Chain Strategy (Appendix 17).

1 Executive Summary

This paper outlines the scope, costs, and benefits of our proposals for capacity upgrades that are necessary on our above 7 bar Offtake and Pressure Reduction System (PRS) sites. We have over 600 above 7 bar sites, each of which play a role in the safe and reliable transportation of gas across our four networks.

We have an obligation under our transporter licence to satisfy a number of conditions. Specific to load and capacity of our network is the condition to supply gas up to and including a 1 in 20 peak year demand. As part of the annual demand forecasting process, we have identified several sites where there is insufficient capacity to meet the 1 in 20 peak year demand without a capacity increase. This increase in demand is attributed to localised connections coming onto the networks such as power generation sites to produce electricity, or new housing or industrial developments.

We forecast the next five years of 1 in 20 peak year demand based on figures provided by NESO (National Energy System Operator) and continuously assess the capacity needs of our networks against this forecast. Currently, we are forecasting that gas demand will trend down at a network level, in both usage and year demand. The sites identified in this paper will be under capacity even with the downtrend in demand, due to localised increases in gas demand. We have assessed the holistic transition pathway Future Energy Scenario (FES) produced by NESO and do not consider it appropriate for this case as it under-estimates peak demand. We have however, undertaken sensitivity testing against the holistic pathway. Please see section 7.2 of this MJP to see how this impacts the investment case.

Our network analysis team have modelled these sites and have identified where the restrictions are. Our assessment methodology for sites included in the cases are discussed in Section 4 with the scope covering design and construction for 8 sites, where the restriction is known. Additionally, feasibility at 5 sites, where it is our intent to progress design and construction for the RIIO-4 base plan.

The below table compares RIIO-2 and RIIO-3 expenditure:

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Table 2: Spend comparison across regulatory periods

2 Project Status and Request Summary

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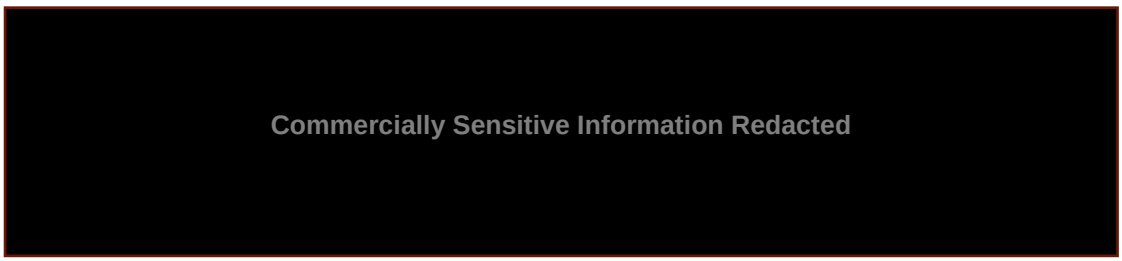

Table 3: RIIO-2 project sites

3 Problem Statement

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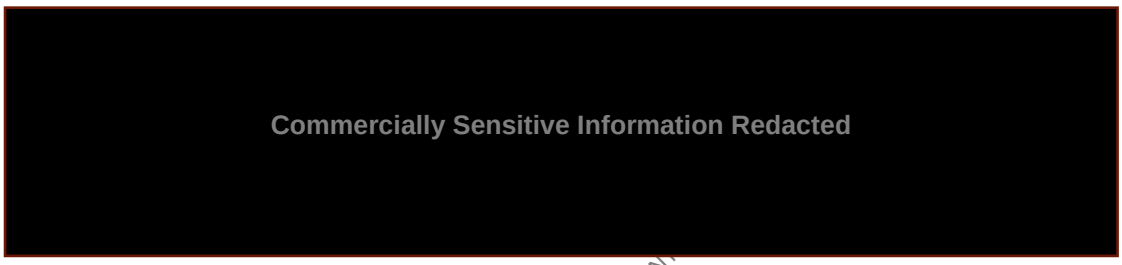

Table 4: Capacity/Demand figures for sites requesting funding for design and build

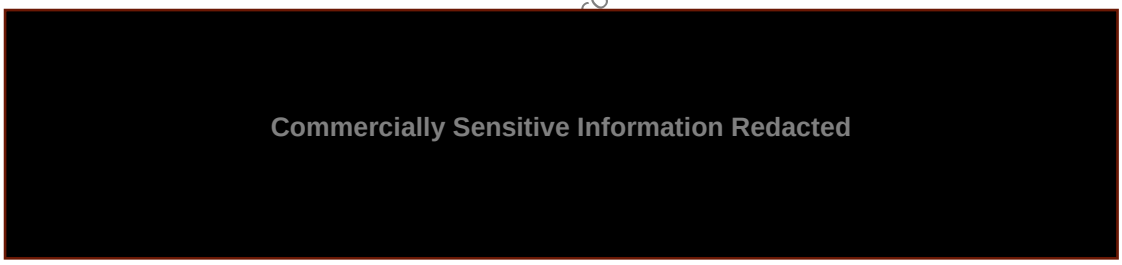

Table 5: Capacity/ demand figures for sites requesting funding for feasibility

3.1.1 Investment alignment to OFGEM outcomes

3.1.2 Key challenges

3.1.3 Key Milestone Dates

3.1.4 Understanding project success

3.2 Related Projects

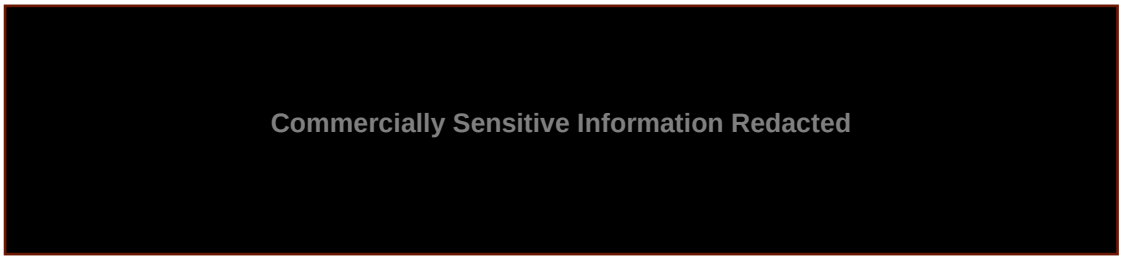

Table 6: Lessons learned from RIIO

3.3 Project Boundaries

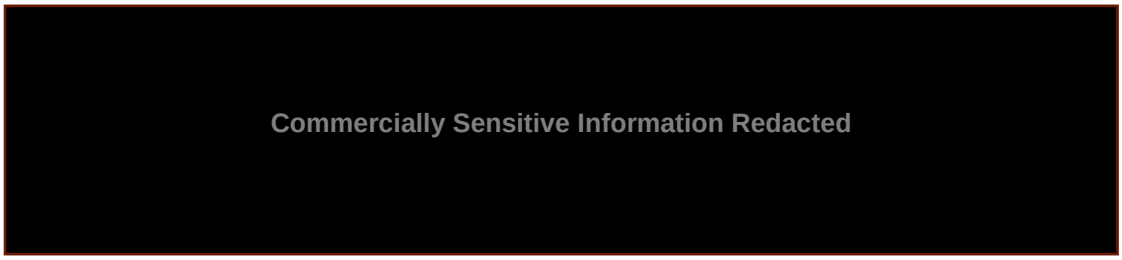

Figure 1: PSD showing assets within scope

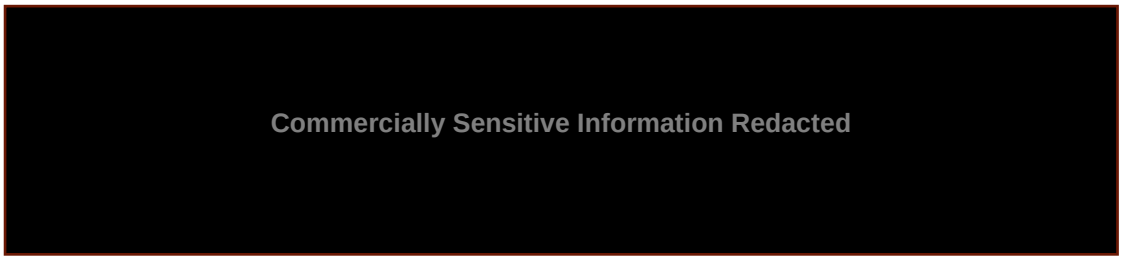

Figure 2: GA showing assets out of scope

4 Project Definition

4.1 Supply and Demand Scenario Discussion and Selection

Our licence states that we must have a network that can meet 1 in 20 year peak winter daily demand. We have reviewed the appropriateness of the FES Holistic Transition pathway as our core Supply-Demand (S-D) scenario. Due to the lack of local, specific data and reviewing our historic actual demands, holistic transition is significantly under-estimating peak demand (1 in 20-year licence obligation) and is therefore not a robust S-D scenario for use in RIIO-3.

As such, our base-case supply demand scenario selected for this paper is the 5-year centralised Supply-Demand forecast which is developed with NESO taking actual demand and historic requirements from us into account. For 2030 to 2032 this forecast has assumed a regressional reduction in demand in relation to each network's forecasted volumes. For further information on our review of the FES future energy scenarios refer to the NAMS, section 3.1.

Due to the lack of local-specific data both within the FES holistic transition pathway and the counterfactual pathway, we have taken a top-down approach to testing the impact of future changes in demand on the "consequence of failure" and the overall cost-benefit of the investment case. This has been achieved by [sensitive data]. For this reason, we have only provided consequence of failure data for our base case supply demand scenario in this section.

The future demand for gas has been considered across all four gas distribution networks to inform this investment case. A summary of our historical and future forecast gas demand for each region is shown in the figure below, (figure 3), based on the actual 5-year forecast provided by NESO. The graphs generally show that the forecast peak gas demand increased in the early part of RIIO-2 but has shown a general decline through the rest of RIIO-2, which is expected to continue into RIIO-3.

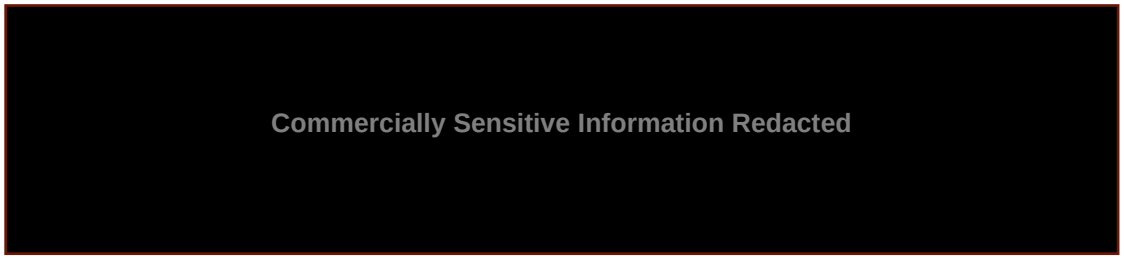

Figure 3: Annual 1 in 20 peak year demand per network trend

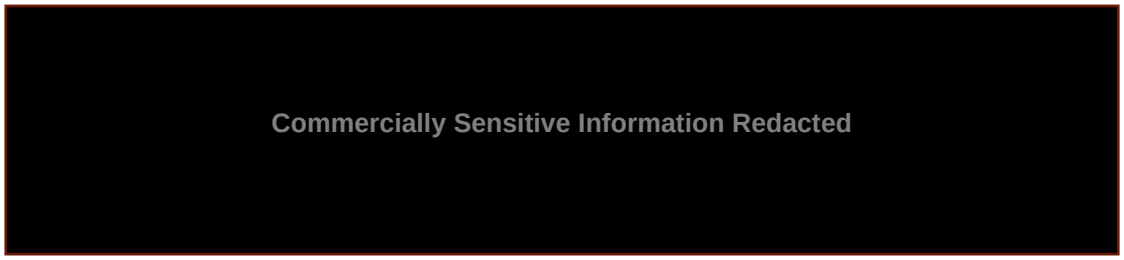

Figure 4: Annual 1 in 20 peak year demand per network

While the long-term trend for gas annual consumption is, on average, continuing to decline, we are not seeing any appreciable indication of a decline in 1 in 20 peak year demand, on average a decrease of [sensitive data]. Our Licence requires us to design our network to meet this 1 in 20 peak year demand condition – that is we must be able to supply gas to our customers when they need it most. We are also observing increases in demand in parts of our network, driven by new housing and industry increasing demand beyond the reductions seen from increased efficiency. This local increase in peak demand in certain areas of the network is driving the specific site capacity upgrades discussed in this paper, as evidenced in the above graph.

The latest 2024 National Grid Future Energy Scenarios (FES) shows an increase in national demand in the 'counterfactual' and 'Hydrogen Evolution' scenarios in the short term.

The counterfactual pathway shows a UK peak gas demand of 5,600 GH in 2027. This pathway is the only one of the FES pathways that does not meet the UK's net zero targets by 2050. The hydrogen evolution pathway shows a peak gas demand of 5,216 GWH in 2025 and would meet the UK's net zero targets by 2050.

At this point, these pathways are guidance and show potential routes the UK and gas industry could go down. Due to uncertainty around what way the UK will go, and a decision not expected to be made by government until we are within the RIIO-3 period, these pathways have not been used to inform our investment decision. The only supply demand scenario we have taken into consideration and planned our investment around is the 5-year centralised supply demand FES scenario as aligns with our 1 in 20 peak year demand licence obligation.

To validate the long-term viability of our investments we have undertaken Cost Benefit Analysis (CBA) on the proposed options and ensured that the NPV and payback periods do not exceed 2042, in line with business plan guidance. Furthermore, we have undertaken sensitivity tests on the FES scenarios, to assess the impact on:

1. [sensitive data].
2. The size of the upgrade required

The results of 1 are discussed in Section 4 and have shown sites need to be upsized in the early years of RIIO-3, and this list of sites is not materially impacted by variation in demand forecast. Further details on the CBA and sensitivity tests can be found in section 6.3.

4.2 Project Scope Summary

The following table sets out a high-level scope of each project:

- Full site rebuild: Where there are multiple assets identified as being a restriction on site, we have recommended a full site rebuild. This will include all assets between the site inlet valve and the site outlet valve
- Full system replacement: All assets within a system to be replaced from system inlet/ isolation valve to system outlet valve

Where a site has no outage window, this means the site cannot be turned off for construction and requires more complex engineering to remove restrictions.

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Table 7: Restrictions and proposed scope per site

The primary objective of the investment is to upgrade and replace component restrictions on the identified sites ensure we continue to provide a secure and resilient network capable of meeting the 1 in 20 peak year demand.

5 Options Considered

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5.1 Modes of Intervention

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Table 8: Modes of intervention

5.1.1 Do nothing – No proactive investment (Baseline)

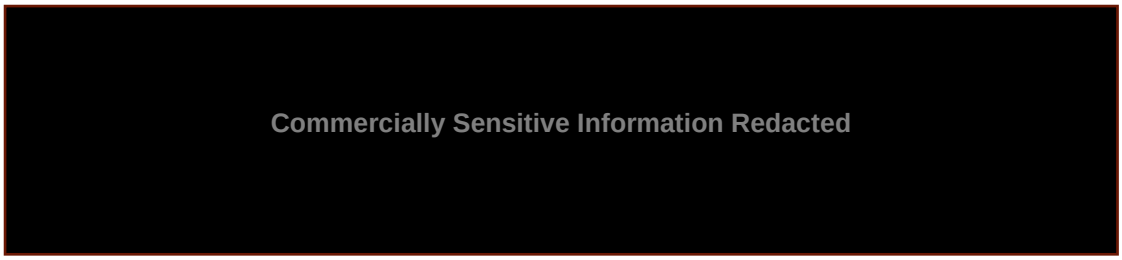

Table 9: Do nothing intervention mode details

5.1.2 Reconfigure network

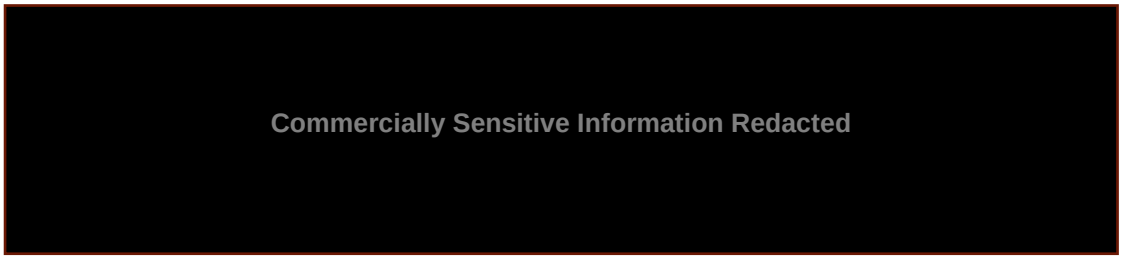

Table 10: Reconfigure network intervention mode details

5.1.3 Component replacement only

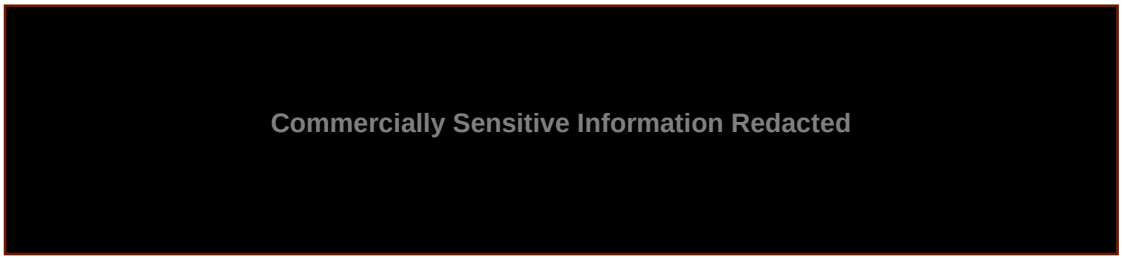

Table 11: Remove restriction intervention mode details

5.1.4 Rebuild entire site

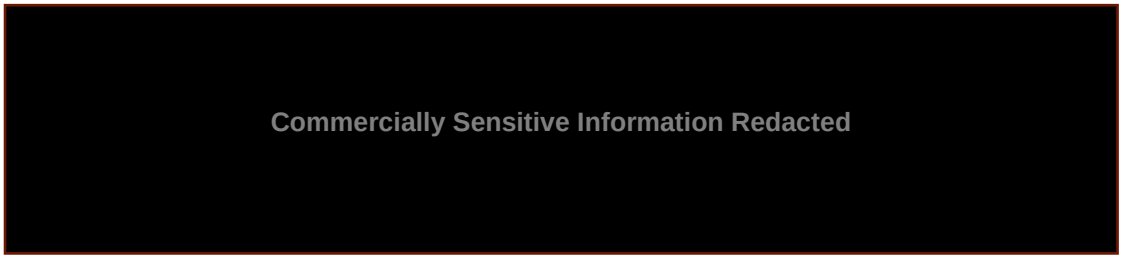

Table 12: rebuild site intervention mode details

5.2 Cost estimate details

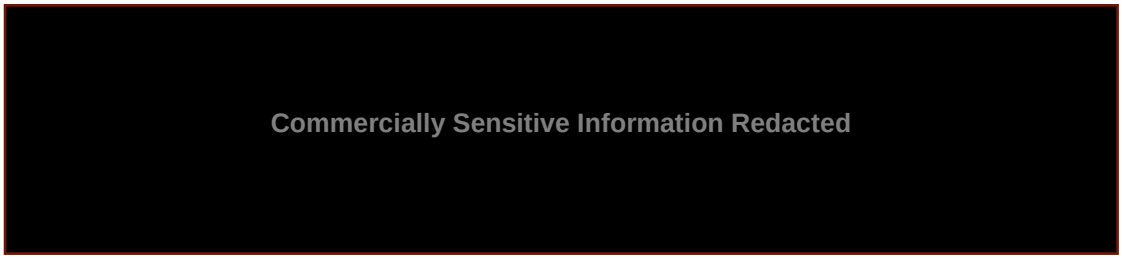

Table 13: Project cost estimates

5.3 Timing Choices

5.4 Options

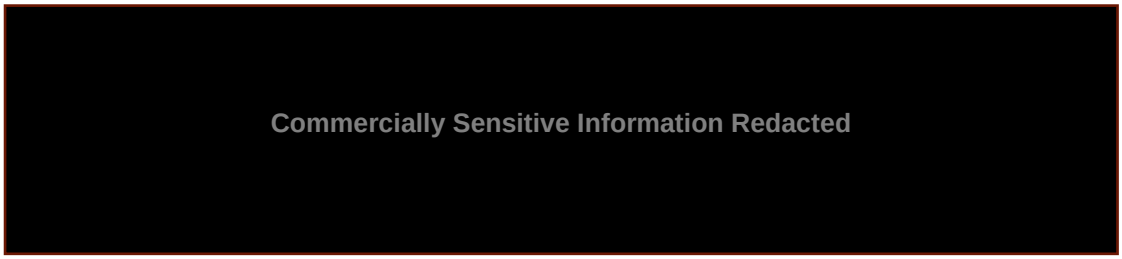

Table 14: Intervention mode timing choices

5.5 Programme Options

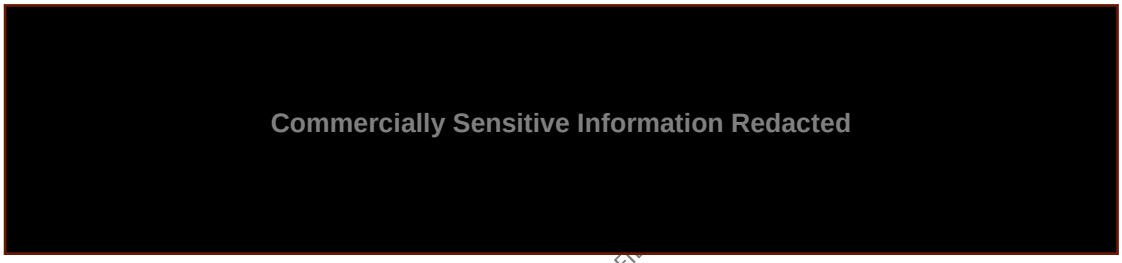

Table 15: Programme options

6 Business Case Outline and Discussion

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6.1 Key Business Case Drivers Description

6.2 Supply and Demand Scenario Sensitivities

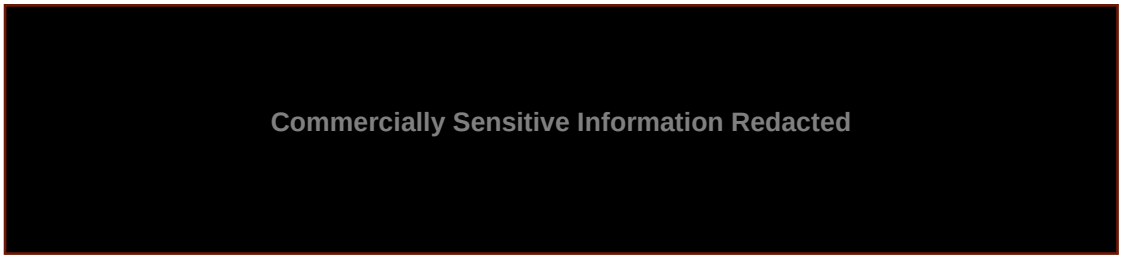

Table 16: Demand scenario sensitivity conclusion

6.3 Business case summary

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Table 17: Technical summary

6.3.1 Key business driver's summary

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Table 18: Business case (programme options comparison)

6.3.2 Discussion of results

6.3.3 Sensitivity analysis

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Table 19: Sensitivity testing

6.3.4 Conclusions

7 Preferred Option Scope and Project Plan

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7.1 Preferred Option for this Request

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Table 20: Preferred option phasing

7.2 Project Spend Profile

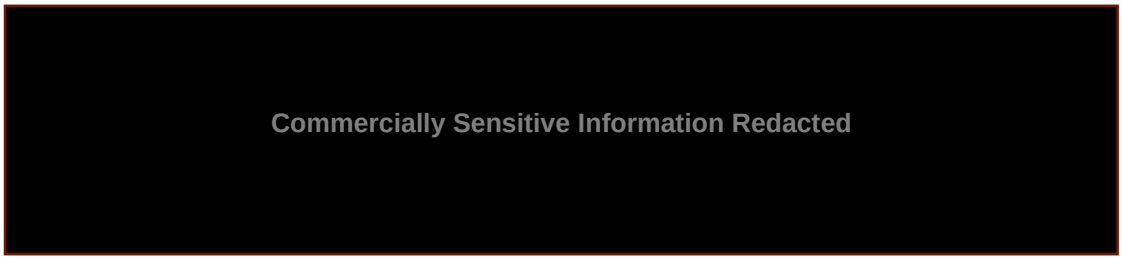

Table 21: Preferred option spend profile

7.3 Efficient Cost

7.4 Project Plan

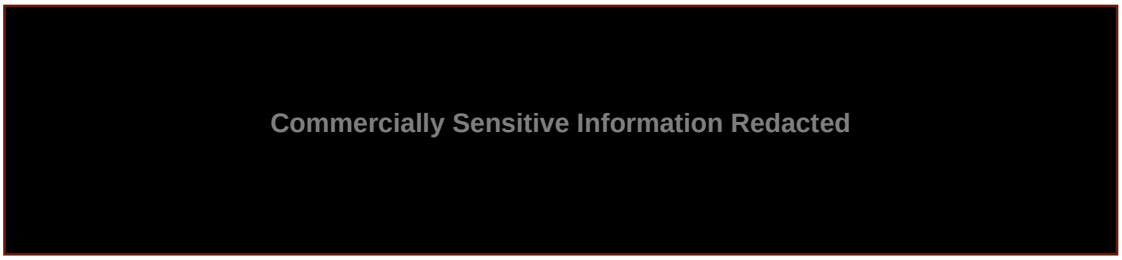

Table 22: Project plan

7.5 Key Business Risks and Opportunities

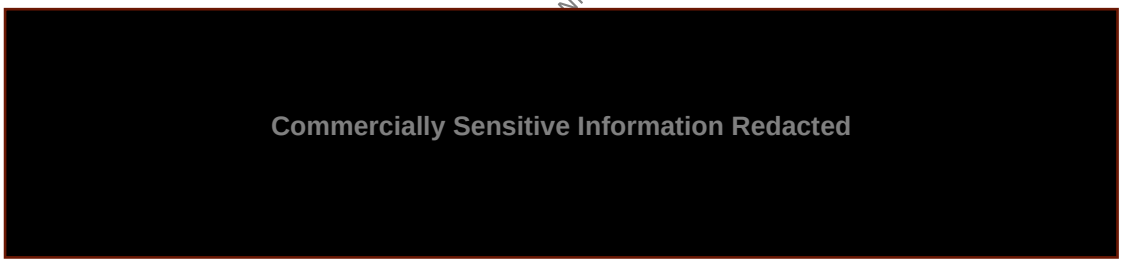

Table 23: Key risks to programme

7.6 Outputs included in RIIO-2 Plans

8 Regulatory Treatment

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9 Glossary

Term	Definition
MJP	Major justification paper
PCD	Price control deliverable
NESO	National Energy System Operator
FES	Future energy scenario
ECC	Energy control centre
NAMS	Network asset management strategy
EAP	Environmental action plan
SCADA	Supervisory control and data acquisition
PSD	Pressure systems drawing
GA	General arrangement
CBA	Cost benefit analysis
UCW	Unit cost workbook
SCO	Safe control of operations
NPV	Net present value
BPDT	Business plan data table

Table 24: Glossary Table

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