

nationalgrid

R110-T3



Kingsnorth 400 kV Extension

LRR Eligibility Letter Submission – Track 2

May 2026

National Grid Electricity
Transmission's Business Plan

Confidential

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Reference and Summary Table

Field	Description
Name of Project	Kingsnorth 400 kV Extension
TO's preferred re-opener track	Track 2 Eligibility Letter (EL)
RRP References	No OSR created to date. Will be included in RRP26 submission
BPDT / Project Reference Number	Not Applicable
Load Board Reference	Not Applicable
Investment Driver	Connection of [REDACTED] demand Data Centre customer.
PASE Compliance	The preferred option is a PASE Variant – we are extending an Indoor Double Bus AIS substation. The extension costs are atypical.
Outputs	<p>The preferred option is Option D-2 delivering:</p> <ul style="list-style-type: none"> 2 x 400 kV bays (one AIS and one SF6 Free GIS) via an extension of the existing 400 kV substation.
Short list of strategic options considered	<p>Two main options were shortlisted for detailed analysis:</p> <ul style="list-style-type: none"> Option D-2: Extend Kingsnorth 400 kV through x1 existing AIS bay and x1 SF6 free GIS bay (populated in existing GIS Hall extension), to a new SGT compound [REDACTED] Option D-3: Extend Kingsnorth 400 kV through x1 existing AIS bay and x1 SF6 free GIS bay (populated in existing GIS Hall extension), to a new SGT compound [REDACTED]
Preferred solution and explanatory narrative on the rationale	<p>The preferred option is Option D-2. The option provides an earlier connection to the transmission network, has better alignment with the customers' requirements, provides further operational resilience due to the additional [REDACTED] SGTs and avoids asset stranding [REDACTED]. The option has a higher initial cost and has a lower NPV compared to Option D-3, however our current estimates show infrastructure costs (costs borne by consumers) of Option D-2 [REDACTED] and Option D-3 [REDACTED] to be near comparable.</p>
Costs	[REDACTED]
Delivery Year	[REDACTED]
Extension cost (applicable only to substations)	Not applicable – Load Guidance asks us to provide the '£m costs for single switch mesh to DBB'. The investment is not undertaking work that could be characterised as single switch mesh to DBB.
Applicable Reporting Tables	No OSR created to date. Will be included in RRP26 submission
Historic Funding interactions	N/A - This project has received no historic funding. There are no early asset write-offs (EAWOs) associated with this project.
Interactive Projects	N/A - This project is not interactive with any other projects.
Spend Apportionment (23/24 prices)	[REDACTED]

1. Executive Summary

1.1 Project Summary

The Kingsnorth 400 kV Extension is a load driven investment which enables the timely connection of a demand customer at an established transmission node, making efficient use of existing assets and brownfield land.

1.2 Submission purpose

We are seeking Ofgem's approval, under the Load Related Re-Opener (Special Condition 3.18 of the RII0-ET3 licence), to progress the Kingsnorth 400 kV Extension as a Track 2 EL investment and to secure Pre-Construction Funding (PCF).

Specifically, this submission requests approval of the needs case, optioneering, preferred solution and PCF of [REDACTED] representing 8.2% of the estimated cost of the preferred option.

1.3 Need

The Kingsnorth 400 kV Extension is a load driven investment, with the proposed investment required to support the following.

- **Customer connections:**

[REDACTED] connection at Kingsnorth of a [REDACTED] demand data centre customer, [REDACTED]

Without this investment, we would be unable to meet our statutory duties to provide efficient connection offers.

1.4 Optioneering and strategic direction

We have undertaken a proportionate, multi factor optioneering process to identify the most efficient solution to meet the identified need. We conducted a high-level assessment of strategic options (do nothing (Option A), market-based (Option B), whole-system (Option C), reuse or extension of existing assets (Option D), and new-build (Option E)) to develop a longlist of seven potential options.

In identifying a shortlist of options for this site, we have balanced:

- Timings to enable delivery by the connection date.
- Ability to provide the customer with their required demand capacity as well as diversity of supply.
- Extension versus new substation.

Options A-C were primarily discounted because they did not provide the required physical transmission connection and therefore would not deliver a compliant connection for the customer.

Option E (new substation) was discounted because it involves a materially [REDACTED] require additional land, and is not deliverable to the customer's contracted dates [REDACTED]

Option D-1 was discounted because [REDACTED] extension is challenging [REDACTED]

Options D-2 and D-3 (both 400 kV extension solutions) were progressed to shortlist as they are technically feasible at Kingsnorth and can deliver the required two-bay connection. Of these, Option D-2 is our preferred solution because it provides the timely [REDACTED] compliant connection, avoids the provision of excess capacity beyond the customer's needs and delivers greater operational resilience.

[REDACTED] Supportive evidence and detailed analysis of our preferred option is set out in Section 4.

Table 1 – Summary of optioneering longlist

Option	Details	Drivers met?	New site?	AIS/ GIS?	Short List?
Option A	Do nothing counterfactual option	No	No	NA	X
Option B	Market-based solution	No	No	NA	X
Option C	Non-transmission, whole systems solutions (DNO)	No	No	NA	X
Option D-1	AIS extension of existing 132 kV substation [REDACTED]	All	No	AIS	X
Option D-2	Extend Kingsnorth 400 kV through x1 existing AIS bay and x1 SF6 free GIS bay (populated in existing GIS Hall extension), to a new SGT compound [REDACTED]	All	No	AIS/Sf6 free	✓
Option D-3	Extend Kingsnorth 400 kV through x1 existing AIS bay and x1 SF6 free GIS bay (populated in existing GIS Hall extension), to a new SGT compound [REDACTED]	All	No	AIS/Sf6 free	✓
Option E-1	New AIS/GIS Substation.	All	Yes	[REDACTED]	X

1.5 Cost Estimates

Based on the latest Cost Book (2023/24 prices) and early project estimates, the preferred option, Option D-2, has total cost of [REDACTED] including risk and contingency. Pre-Construction Funding of [REDACTED] is requested to progress surveys, planning and land activities, FEED and detailed design, enabling works, security works and mobilisation activities required to mature the project ahead.

[REDACTED]

1.6 Indicative delivery programme

The project is planned for delivery in two stages:

[REDACTED]

2. Introduction

2.1 Kingsnorth 400 kV Extension

This submission, coupled with its Annexes and Cost Benefit Analysis (CBA), is made under the Load Re-opener and Price Control Deliverable (Special Condition 3.18 of the RIIO-ET3 Licence) for the Kingsnorth 400 kV Extension project.

This submission sets out a preferred solution and is therefore combined with a Needs Case assessment.

The submission seeks the following determinations from Ofgem:

- approval of project eligibility under the Load Re-opener and Price Control Deliverable (Special Condition 3.18);
- agreement of the needs case, optioneering undertaken and the preferred solution (Option D-2);
- confirmation that the project should proceed via Track 2 EL of the re-opener process; and
- approval of Pre Construction Funding (PCF) under Special Condition 3.15 (Pre Construction Funding Reopener, Price Control Deliverable).

The investment will enable the connection of a [REDACTED] Data Centre.

2.1.1 Eligibility, Project Track Statement and PASE

The project qualifies under Special Condition 3.18 as a load driven investment scheduled for delivery within the RIIO-ET3 period and where its forecast costs exceed the thresholds within volume driver mechanisms.

This submission proposes the Track 2 EL Load Reopener process for assessment. We are proposing a PASE Variant solution.

2.1.2 Pre-Construction Funding Request

Under Special Condition 3.15 of the Electricity Transmission licence, this investment qualifies for allowances equal to [REDACTED] of its total forecasted cost [REDACTED] at the time of this Load Re-opener Eligibility Letter submission).

Based on our current forecast we have provided below breakdown of costs amounting [REDACTED] as part of this submission. This equates to [REDACTED] of the latest total forecast costs project costs.

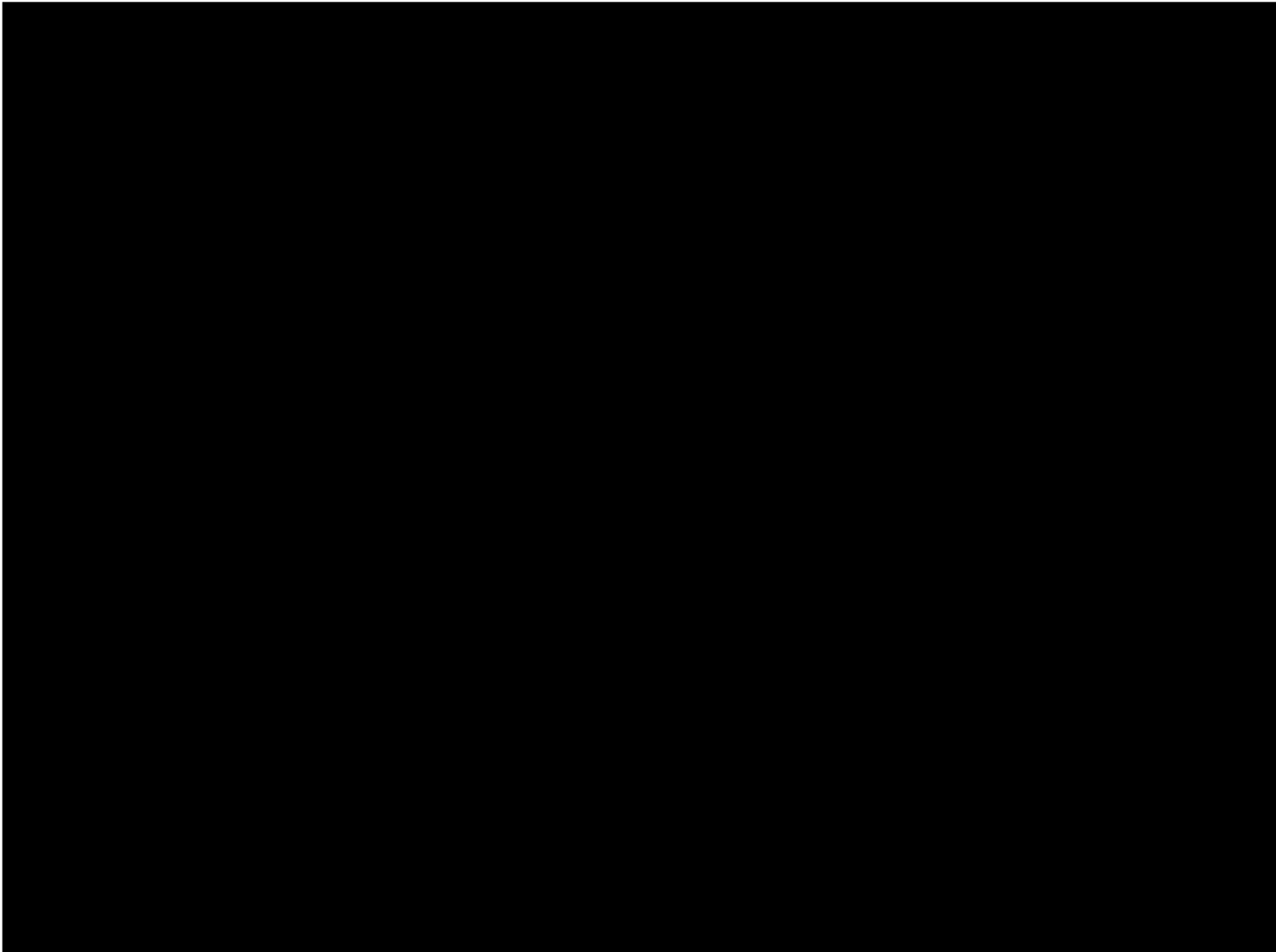
Table 2 below summarises the activities covered by the application of these PCF allowances based on our current progress of PCF and EEW spend. This position will be updated as we continue to mature this investment and ultimately reconciled at Project Assessment stage of the re-opener.

We confirm that no PCF activity included in this submission has been funded through baseline allowances, other re-openers, or alternative licence mechanisms.

2.2 Background

2.2.1 Chronology of investment

The chronology of the investment, drivers and connection dates is covered in Figure 1.



2.2.2 Regional & Network Context

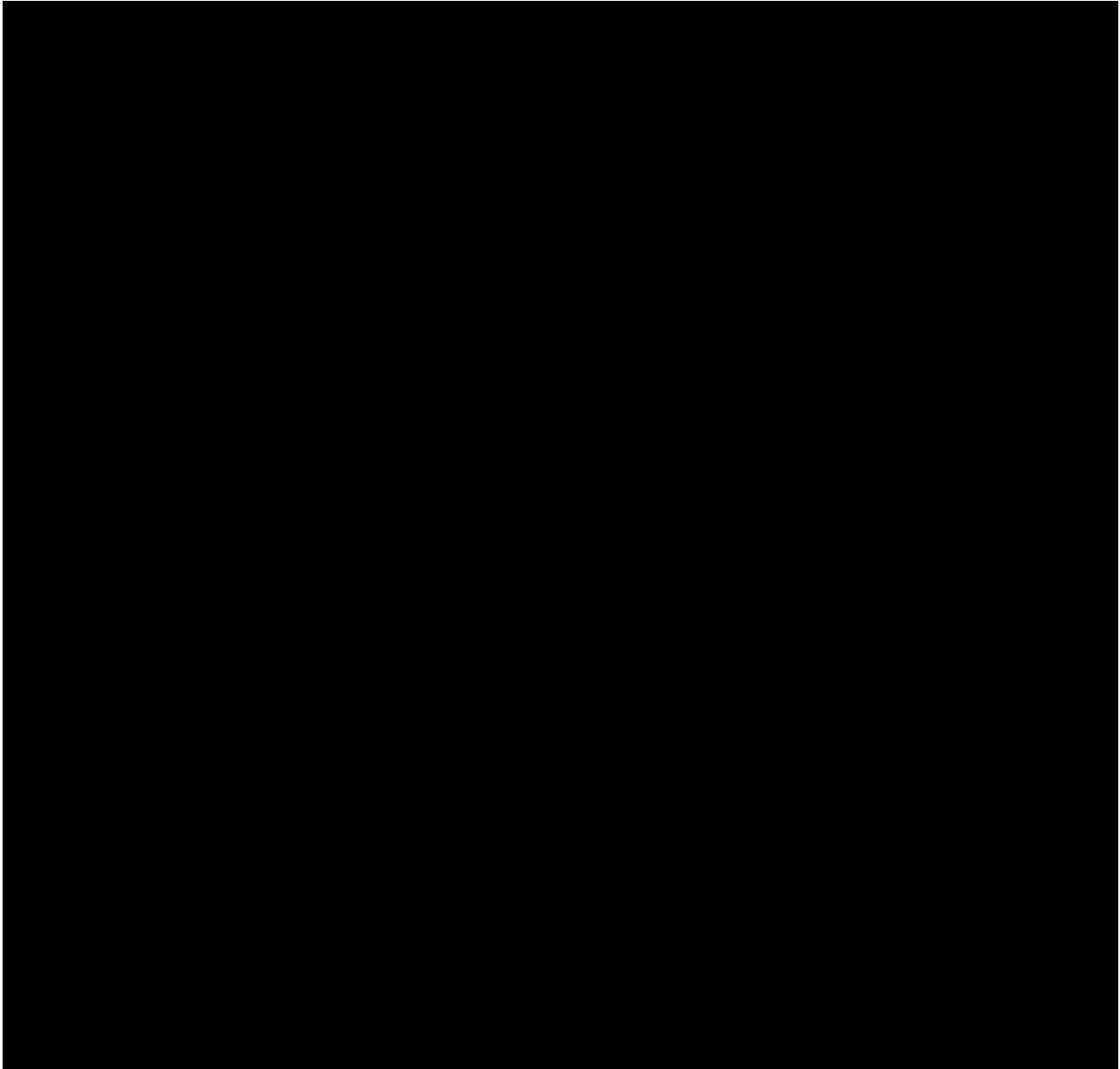
Kingsnorth forms part of the Estuary region, alongside the Tilbury, Grain, Braintree, Rayleigh, Northfleet East, Singlewell, Barking, West Thurrock and Coryton South substations. The region sits on the 400 kV coastal backbone extending from the Thames Estuary through the Southeast to the Solent, linking into the wider arterial transmission routes across southern England.

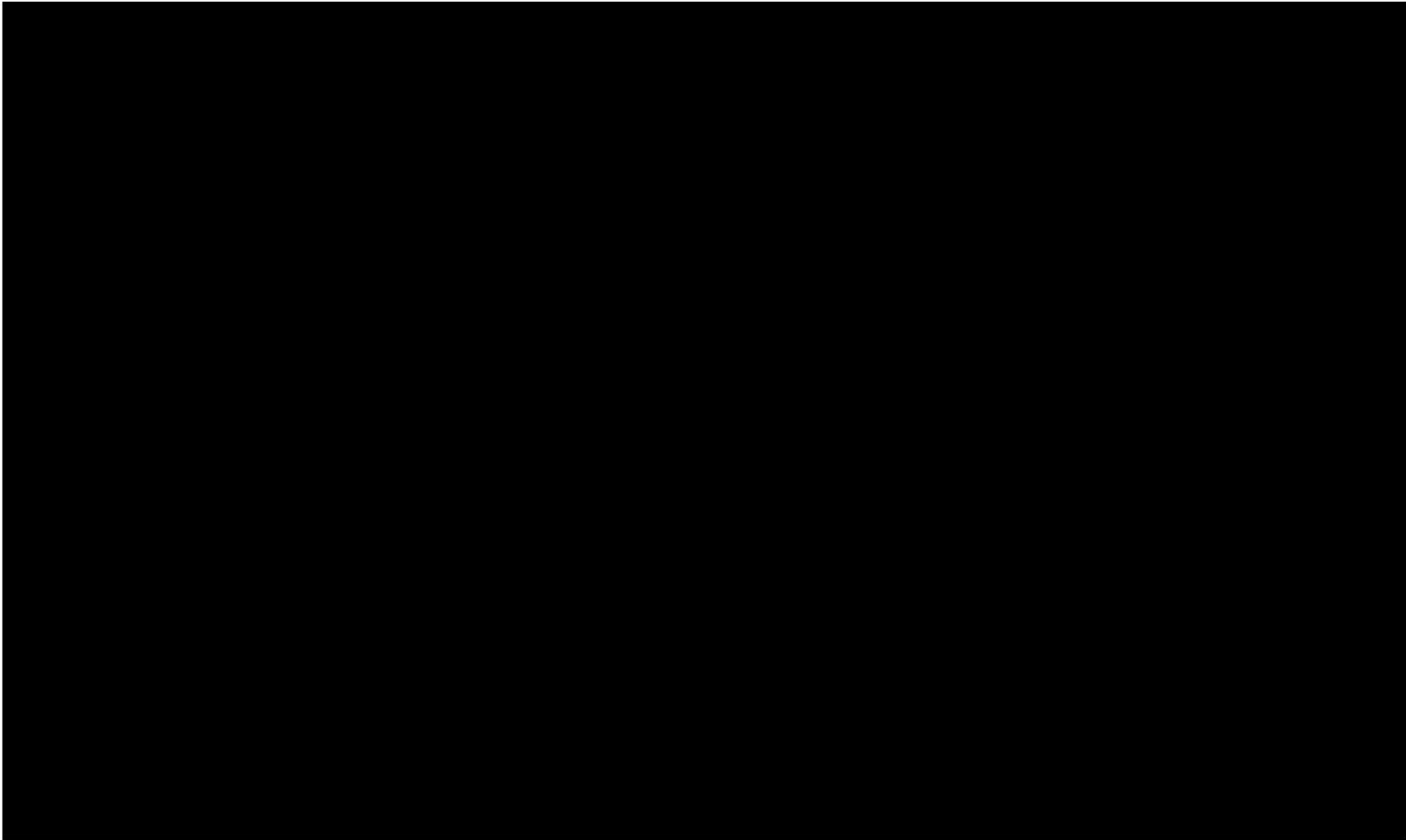
The Estuary region primarily operates as a net importer of power, with flows supporting major export points and interconnectors during periods of high renewable generation. Power transfers can give rise to constraints on key 400 kV corridors under certain outage conditions, with occasional operational impacts associated with interconnector swings, including those on the [REDACTED] HVDC link at Grain.

The region is also subject to ongoing and planned infrastructure activity, including upgrades to the Thames cable tunnel and the Tilbury–Grain corridor, which connects key energy and industrial hubs in Kent and Essex and is intended to relieve existing capacity constraints [REDACTED]

Existing generation connected in the region is predominantly Combined Cycle Gas Turbine (CCGT) based, including [REDACTED] connecting at Grain 400 kV.

[REDACTED] and Figure 3 provides a transmission network map and Kingsnorth's location within this.



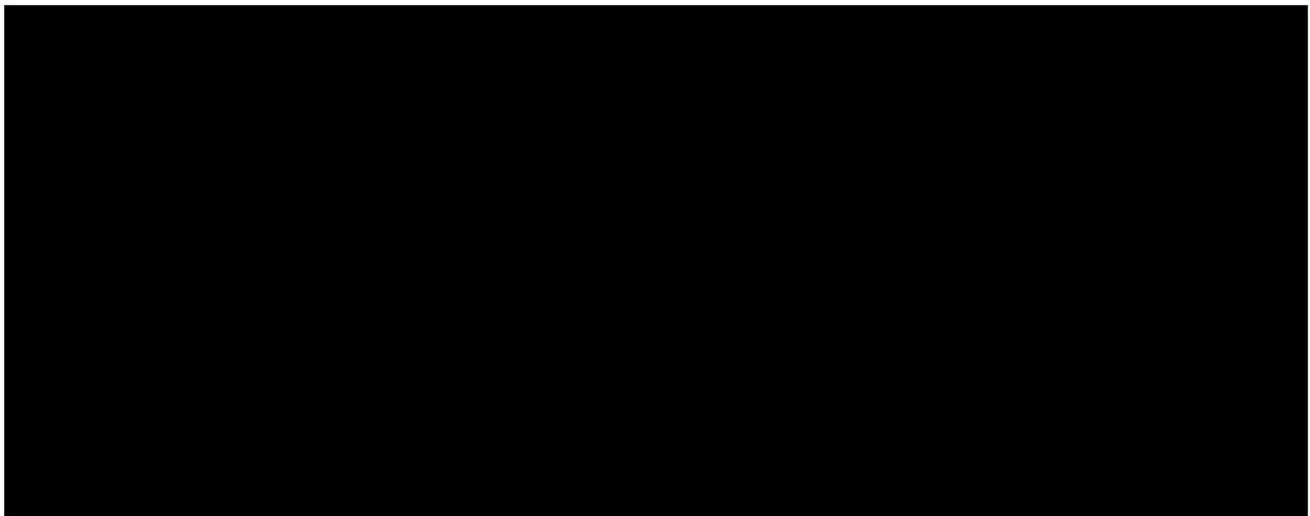


2.2.2.1 Interactive projects

[Redacted text]

[Redacted text]

[Redacted text]

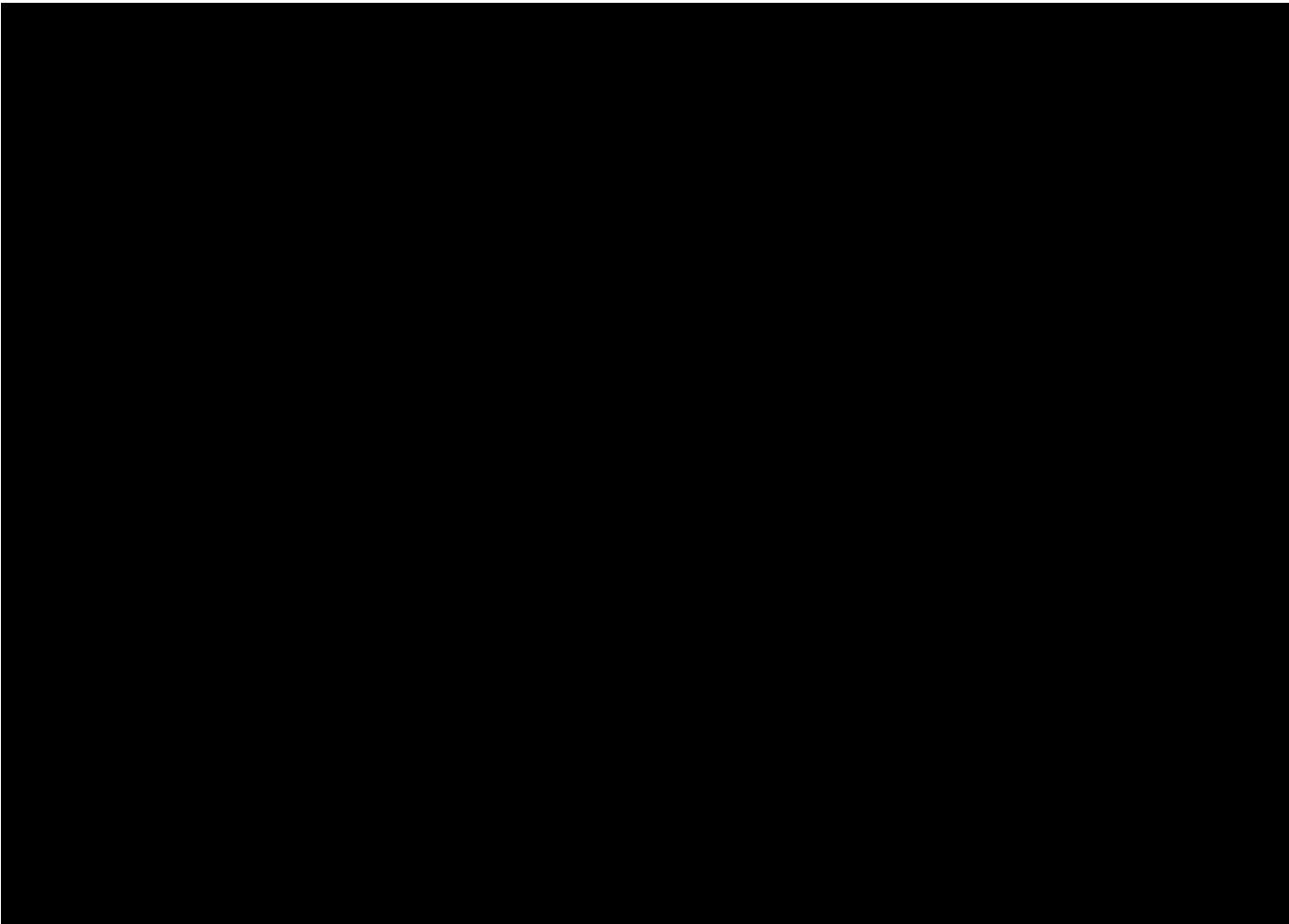


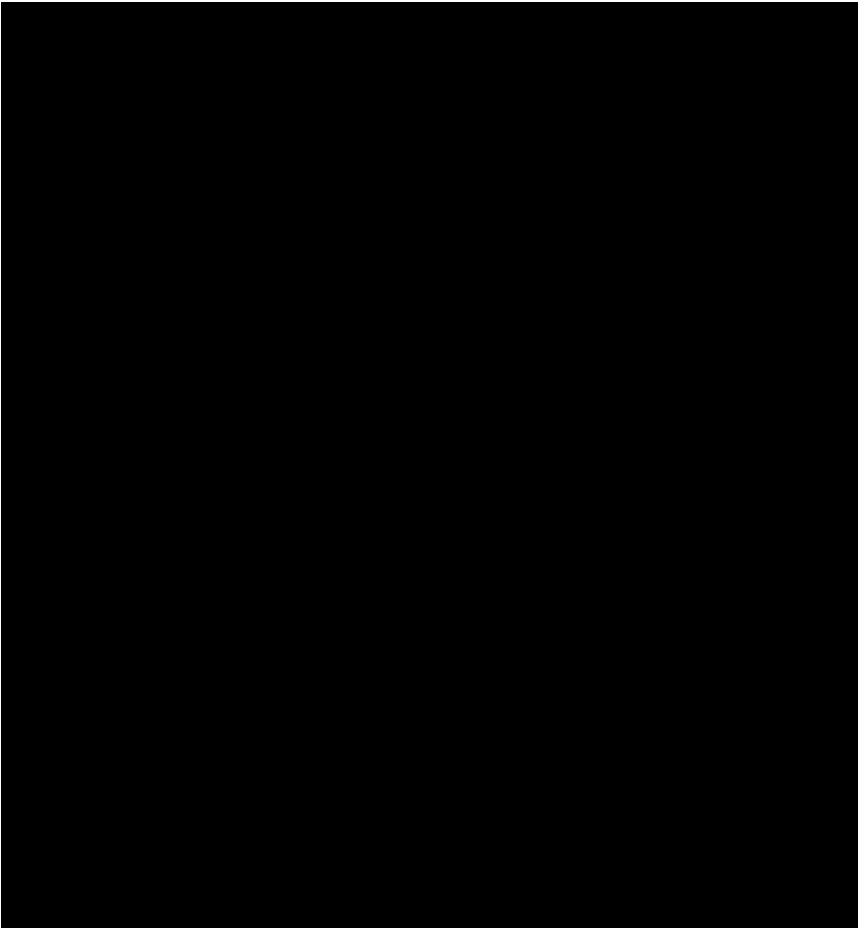
2.2.3 Site background

Kingsnorth is a site in Rochester, Kent made up of two indoor substations: Kingsnorth 400 kV and 132 kV. The substations were built as part of the now decommissioned and demolished Kingsnorth Power Station (PS), in the 1960s to 1970s.

[Redacted text block]

[Large redacted text block]





2.2.4 Historical funding

Not applicable, this project has received no historic funding.

2.2.4.1 Early Asset Write Off (EAWO)

Not applicable, this project has received no historic funding.

3. Drivers & Needs Case

The driver necessitating the Kingsnorth extension is the customer connection of [REDACTED] Data Centre, over two stages [REDACTED]

[REDACTED]

[REDACTED]

3.1 Customers

The list of customers is provided in Table 4 below. This project has one customer connection driver

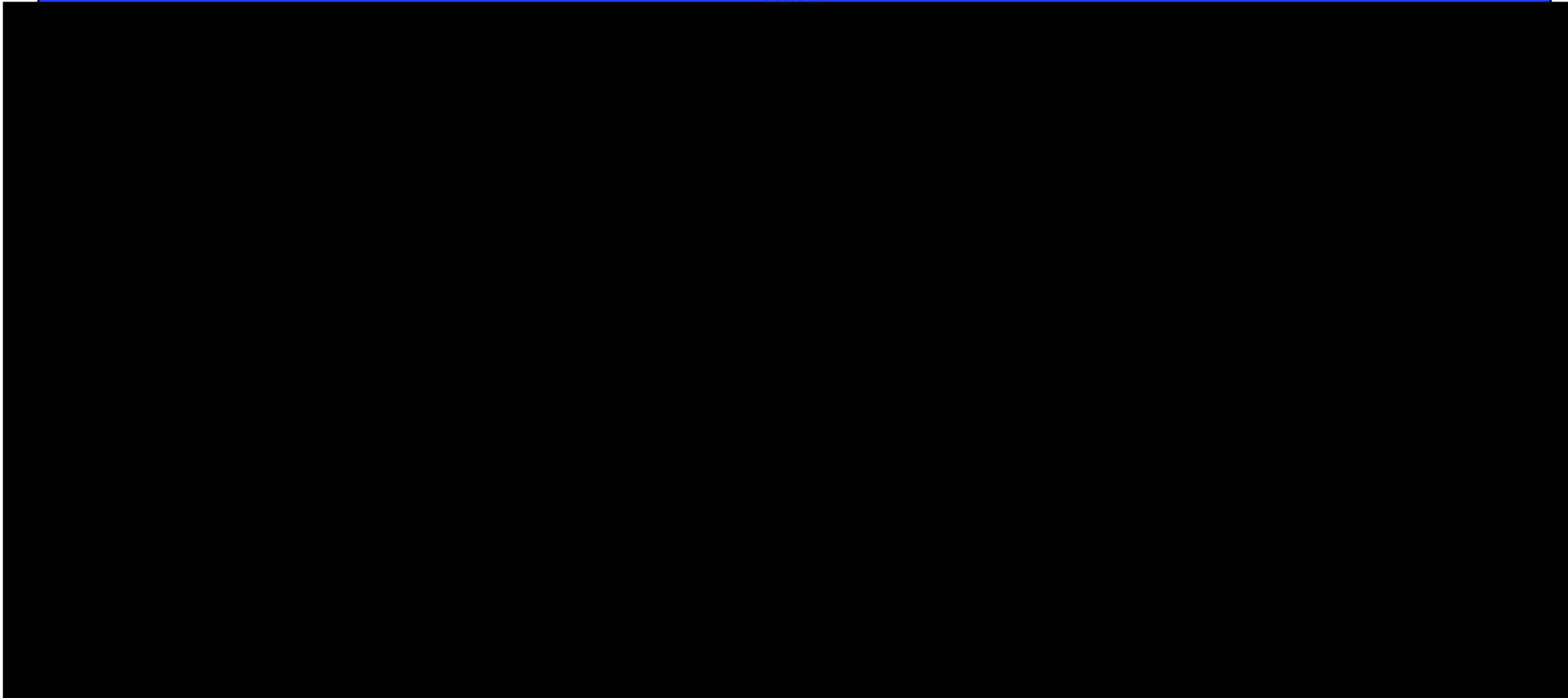
[REDACTED]

[REDACTED]

[REDACTED]

Table 4 - Details of customers with contracted connection

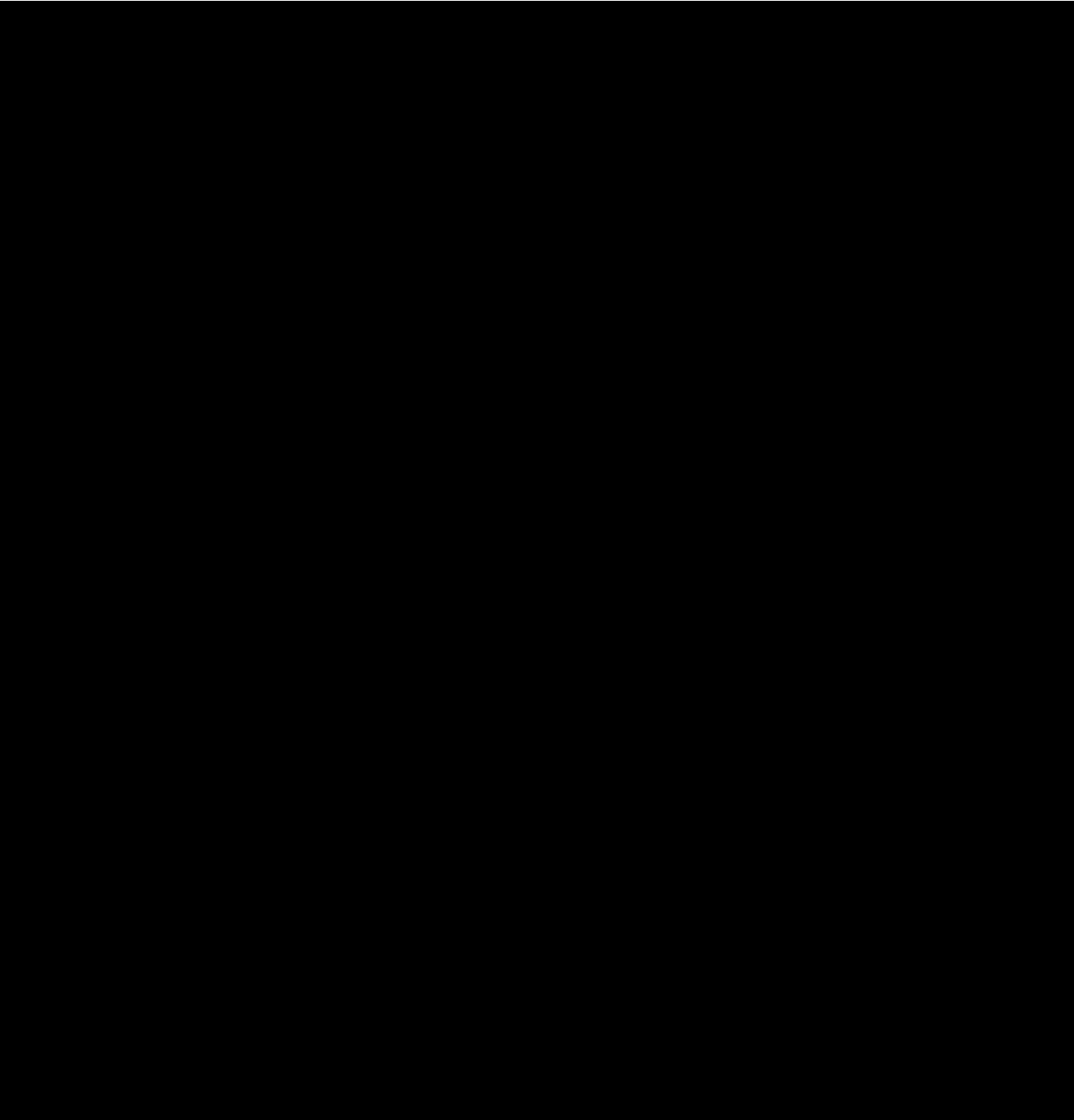
Customer name	Project name	Technology Type	Embedded Generation	MW Size	Voltage	Original ACL date	Connections Reform Gate
400 kV							



3.2 Asset Health Summary

[Redacted content]

[Redacted content]



This submission seeks funding only for the load-related scope described herein. Where load-related scope delivered through reopeners replaces previously allowed non-load-related (NLR) asset funding included within the T3 Final Determination, the corresponding NLR outputs will not be delivered and therefore the NLR PCDs will act as designed to remove associated NLR funding.

Delivery of asset health interventions will be optimised, taking account of outage availability and practical interactions between activities. Where load-related and asset health interventions coincide, delivery may be coordinated to improve efficiency and minimise disruption. Such coordination does not alter the underlying investment drivers, nor the portfolio-level governance or funding treatment of non-load asset health interventions.

¹ In accordance with the decision-making framework set out in 'NGET_RII03_NGETQ10_Asset Health Decision Making', submitted as part of our RII0-T3 Draft Determination response.

Further detail on wider site-level asset health interventions is provided within the RIIO-T3 Asset Health Portfolio EJP and associated supporting documentation, which should be referenced for completeness.

4. Optioneering

We follow a structured, multi-factor optioneering process to select the most economic and efficient solution, in the interest of consumers. Our optioneering process takes into account engineering, environmental, deliverability, economic and stakeholder factors. We start by assessing the most suitable strategic options.

4.1 Strategic Options

In line with our standard optioneering process, we considered the following broad strategic options, Strategic/long list options are shown in in Table 8.

Table 8 – Strategic options summary table

Option Number	Option Name	Option Description
A	Do nothing	The network is kept in its current state, and no new connections are facilitated.
B	Market based solution	Increased customer demand is accommodated through the procurement and use of ancillary services only.
C	Whole systems solution	The required customer connection is accommodated by a DNO.
D	Make use of existing assets	Facilitating the requested connection by utilising the existing substation (extension, uprating, etc.)
E	New build	Facilitating the requested connection by building a new substation.

We discounted Options A, B and C due to the inability of these options to facilitate the connection requests and therefore fulfil our licence obligation, Transmission Licence (Licence Condition C8). As detailed below, our initial high-level assessment concluded that the drivers could be effectively met by making use of existing assets. A descriptive rationale is explained in Section 4.3, Table 9.

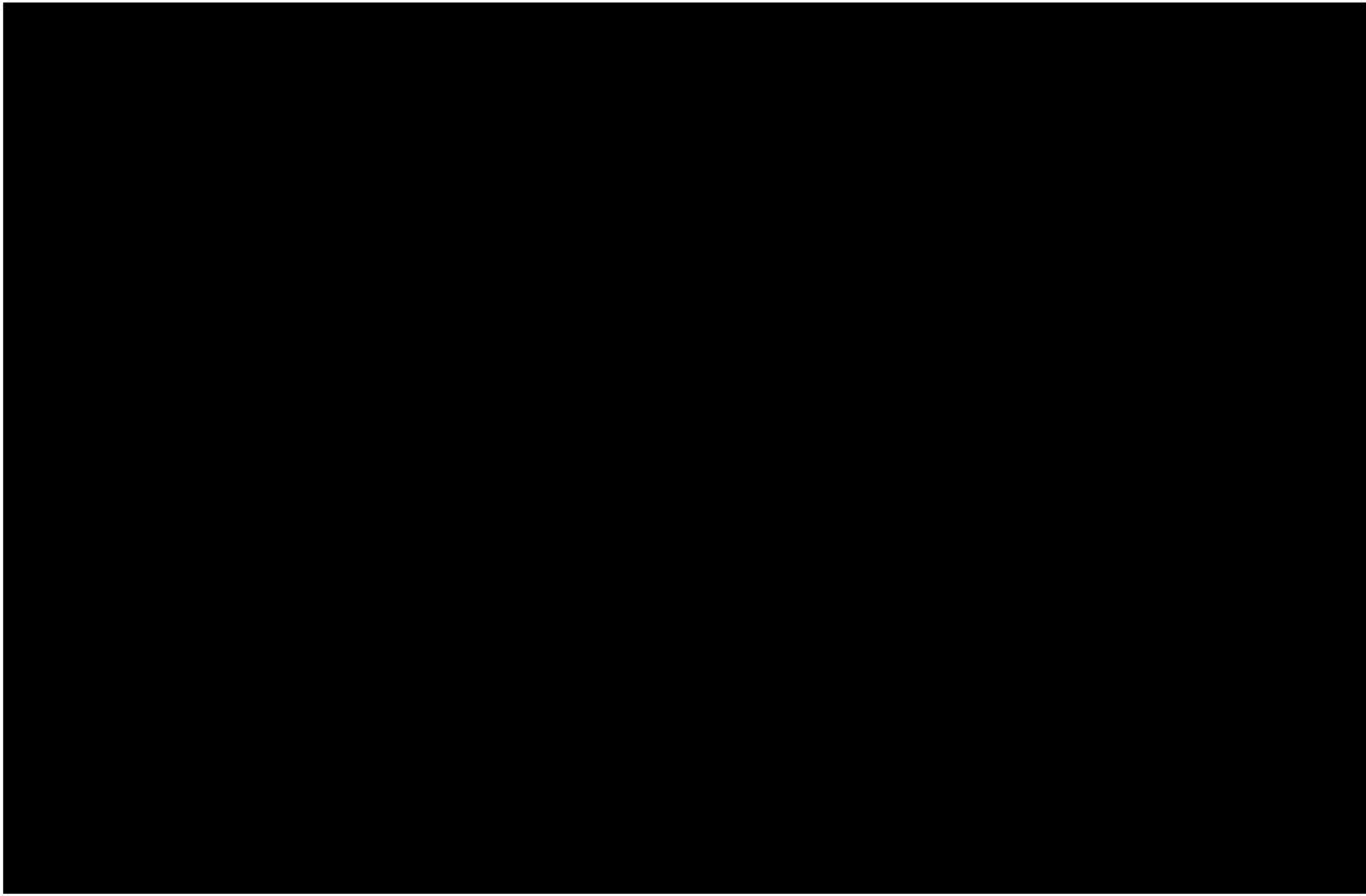
4.2 Siting

There was no detailed siting study conducted as early optioneering confirmed we could meet the drivers through use of an existing substation.

Kingsnorth is the preferred location for the extension, it is located [REDACTED] in a straight line from the customer, ruling out other substations further away. It enables the connection to be made at an established asset which is on a brownfield site. [REDACTED]

[REDACTED] These considerations led us to decide to extend Kingsnorth and featured within our optioneering discussed below.

[REDACTED]

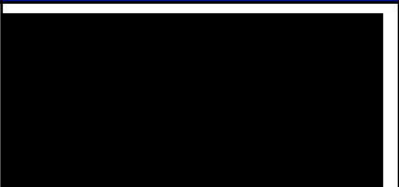




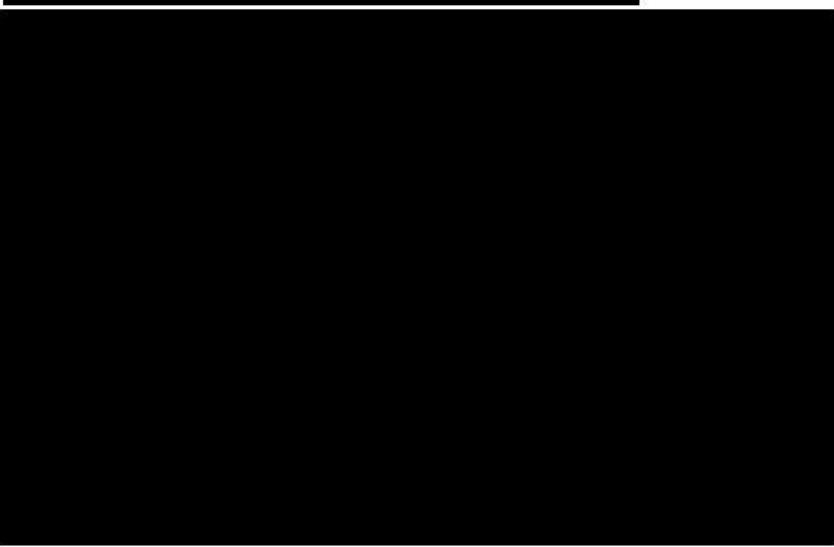


4.3 Summary of all identified design options

In line with our internal processes and Ofgem's *Load Re-opener Guidance*, we have undertaken a multifactorial assessment of the options to identify the option that offers the best overall outcome for consumers. The assessment is summarised below.

Table 9 – Longlist of options considered

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
<p>Option A: Do nothing Not progressed</p>	<p>The network is kept in its current state, and no new connections are facilitated.</p>	<p>N/A</p>	<p>N/A</p>	<p>Engineering: Compliant customer connection not delivered.</p> <p>Under conditions of its Transmission Licence (Licence Condition C8), We have a statutory duty to make offers to provide connections to signed customer agreements. Licence Condition C17, requires NGET to plan, develop and operate the transmission system, in accordance with the NETS SQSS.</p> <p>The Do-Nothing option was therefore discounted as it would go against NGET Licence Obligations.</p>
<p>Option B: Market-based solution Not progressed</p>	<p>Increased customer demand is accommodated through the procurement and use of ancillary services only.</p>	<p>N/A</p>	<p>N/A</p>	<p>Engineering: Compliant customer connection not delivered.</p> <p>New customer connections require physical connections to the transmission network. The market-based option was discounted as it does not enable this.</p>
<p>Option C: Non-transmission, whole systems solution Not progressed</p>	<p>This option involves addressing the identified need through coordinated interventions across the wider electricity system instead of constructing new transmission assets.</p>	<p>N/A</p>	<p>N/A</p>	<p>Engineering: Compliant customer connection not delivered. [REDACTED]</p> <p>Land: At Kingsnorth, the [REDACTED]</p> <p>Consents: [REDACTED]</p>

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
<p>Option D-1: Extend the existing 132 kV AIS Kingsnorth substation</p> <p>Not progressed</p>		<p>No drawing</p>	<p>Reserve Matters Application</p>	<p>Engineering: The 132 kV indoor AIS substation cannot accommodate the connection without extension due to lack of space within the indoor facility for additional customers and SGT bays </p>    

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
<p>Option D-2: Extend the existing 400 kV Kingsnorth substation, 400/33 kV SGTs</p> <p>Progressed to shortlist</p>	<p>This option involves extending Kingsnorth 400 kV substation via x2 dedicated bays to 4x400/33 kV [redacted] transformers. NGET to construct the 33 kV AIS bays within the SGT compound.</p>	<p>See 4.4.1</p>	<p>Reserve Matters Application</p>	<p>Land, planning and consents: [redacted]</p> <p>Engineering: Provides the required connection and demand capacity as well as diversity of supply.</p> <p>Deliverability: Project is deliverable within timeframes for connection. Outputs of further analysis contained within Table 5.</p>
<p>Option D-3: Extend the existing 400 kV Kingsnorth substation, 400/132 kV SGTs</p> <p>Progressed to shortlist</p>	<p>This option involves extending Kingsnorth 400 kV substation via x2 dedicated bays to 2x400/132 kV [redacted] transformers. User would be responsible for the 132 kV AIS substation and 132/33 kV stepdown transformers.</p>	<p>See 4.4.1</p>	<p>Reserve Matters Application</p>	<p>Engineering: Provides a compliant connection. Outputs of further analysis contained within Table 5.</p>
<p>Options E: Construct a new 132/400 kV substation</p> <p>Not progressed</p>	<p>This option involves the construction of a new 400 kV and 132 kV substation.</p>	<p>No drawing</p>	<p>This would likely require land acquisition, TCPA and increased environmental impact due to footprint.</p>	<p>Engineering: Extension options satisfy the known drivers without the overbuild of this option. [redacted]</p> <p>Consumer Value: We estimate a new 400 kV and 132 kV AIS substation with associated SGTs will cost in excess [redacted] to deliver. Option D-2 and D-3 provide a connection at lower cost.</p> <p>Deliverability: [redacted]</p> <p>Environmental: Increased ecological, BNG and visual impacts compared to Option D-2 or D-3 owing to larger footprint.</p>

In summary:

- Options A-C were primarily discounted because they did not provide the required physical transmission connection and therefore would not deliver a compliant connection for the customer.

Option D-1 was discounted because the existing 132 kV indoor AIS substation cannot accommodate additional bays/SGTs and extension is challenging

- Options D-2 and D-3 (both 400 kV extension solutions) were progressed to shortlist as they are technically feasible at Kingsnorth and can deliver the required two-bay connection.
- Option E (new substation) was discounted because it involves a materially higher cost (c.

4.3.1 Influence of stakeholders on shortlisting

Land and Siting:

4.4 Shortlisted Options

- Option D-2:** Extend the existing 400 kV Kingsnorth substation, SGTs.
- Option D-3:** Extend the existing 400 kV Kingsnorth substation, SGTs.

4.4.1 Description of shortlist options

Option D-2 – AIS and SF6 free extension of Kingsnorth 400 kV substation via x2 dedicated bays (x1 existing AIS and x1 SF6 free GIS) to transformers feeding AIS bays within the SGT compound.

The option involves the installation of SGTs that are connected to the Kingsnorth 400 kV substation

Initial optioneering and development of this option by FEED has confirmed that there is space adequate to house the SGT compound

The scope of works for this option is listed as follows:

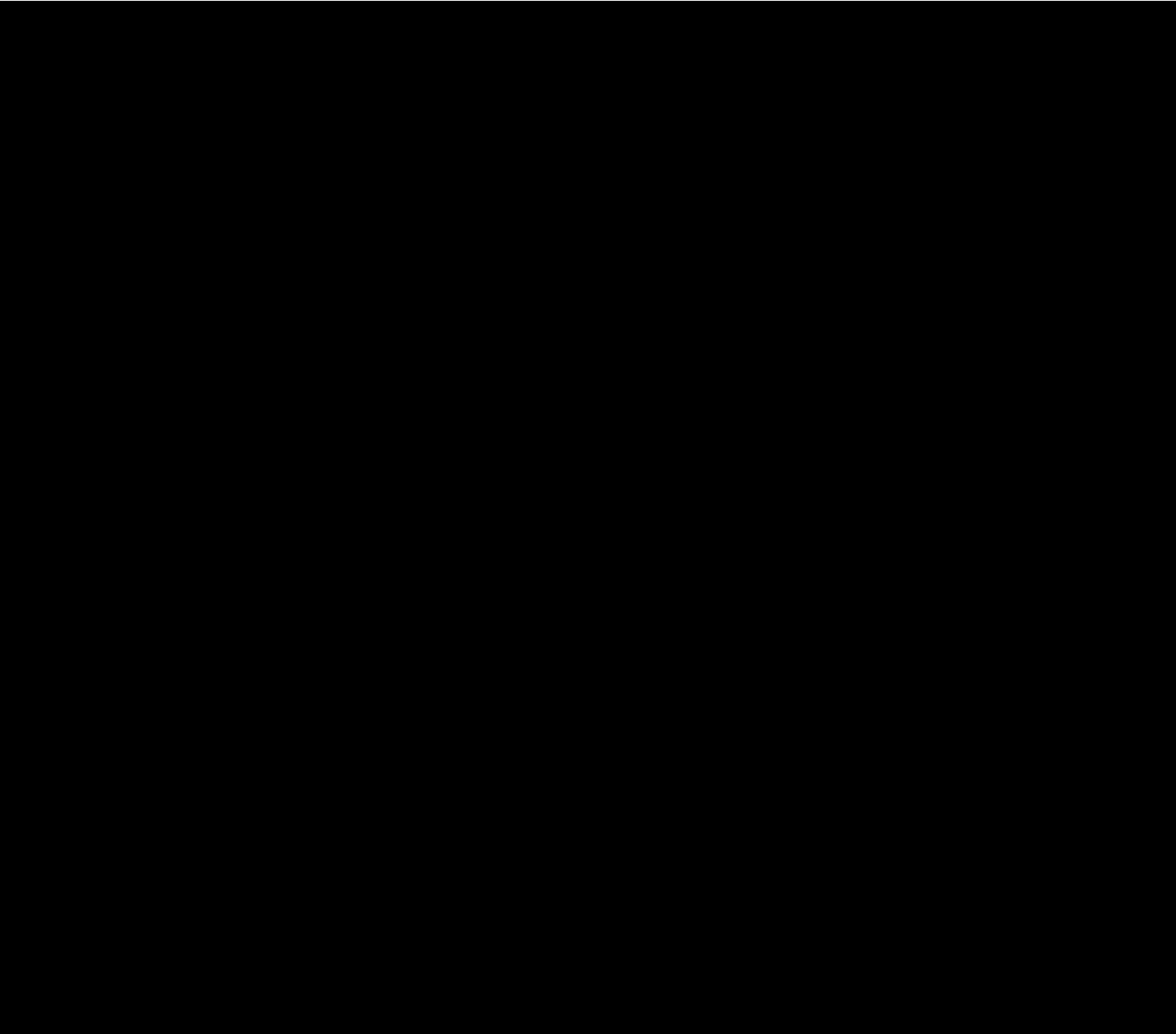
[REDACTED]

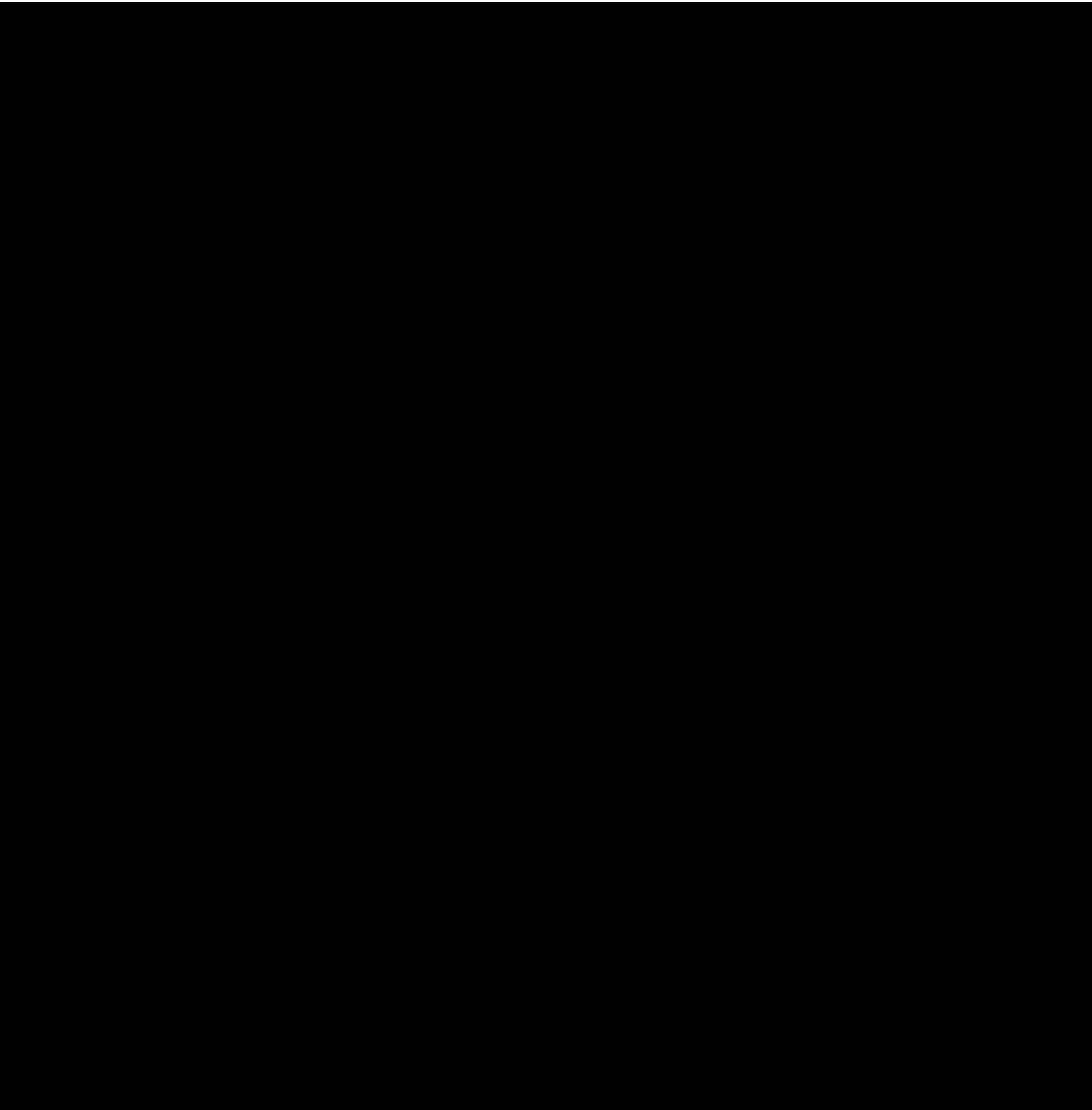
This option provides the customer with their required [REDACTED] of demand [REDACTED]

For Options D-2 and D-3, the customer has specified a need for increased resilience, which is achieved by connecting the SGTs to separate bus sections. By linking the SGTs to two AIS bays at the 400 kV located in the same bus section, rather than the proposed configuration of one AIS and one SF6-free GIS bay, would reduce system resilience. In Option D-2, the provision of [REDACTED] addresses the customer's request for additional redundancy.

[REDACTED]

[REDACTED]



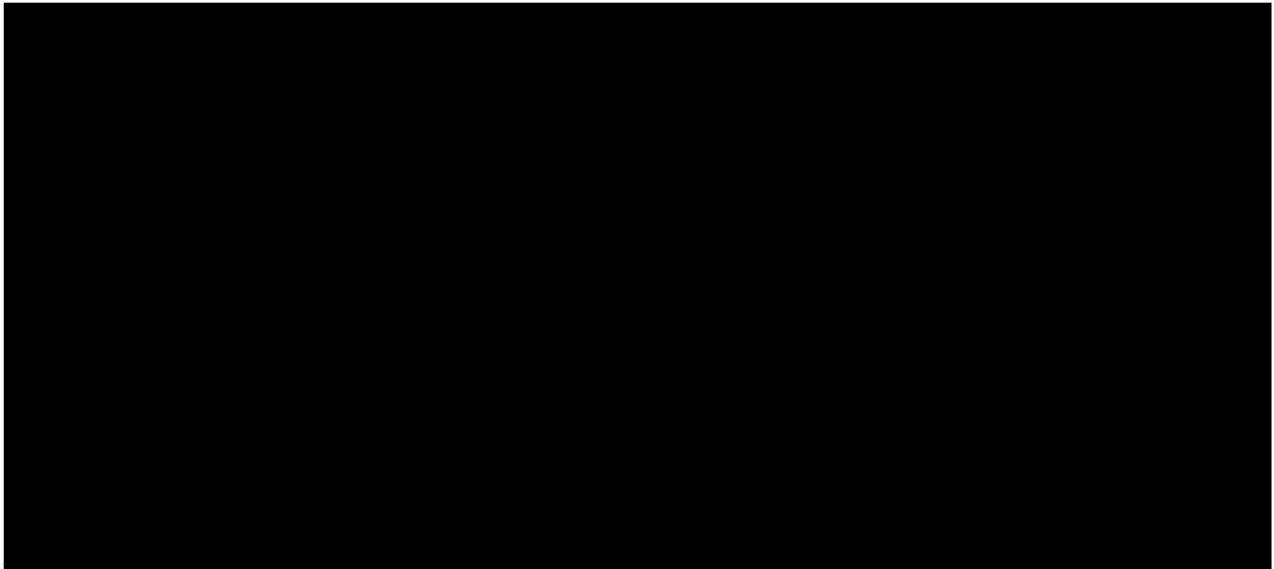


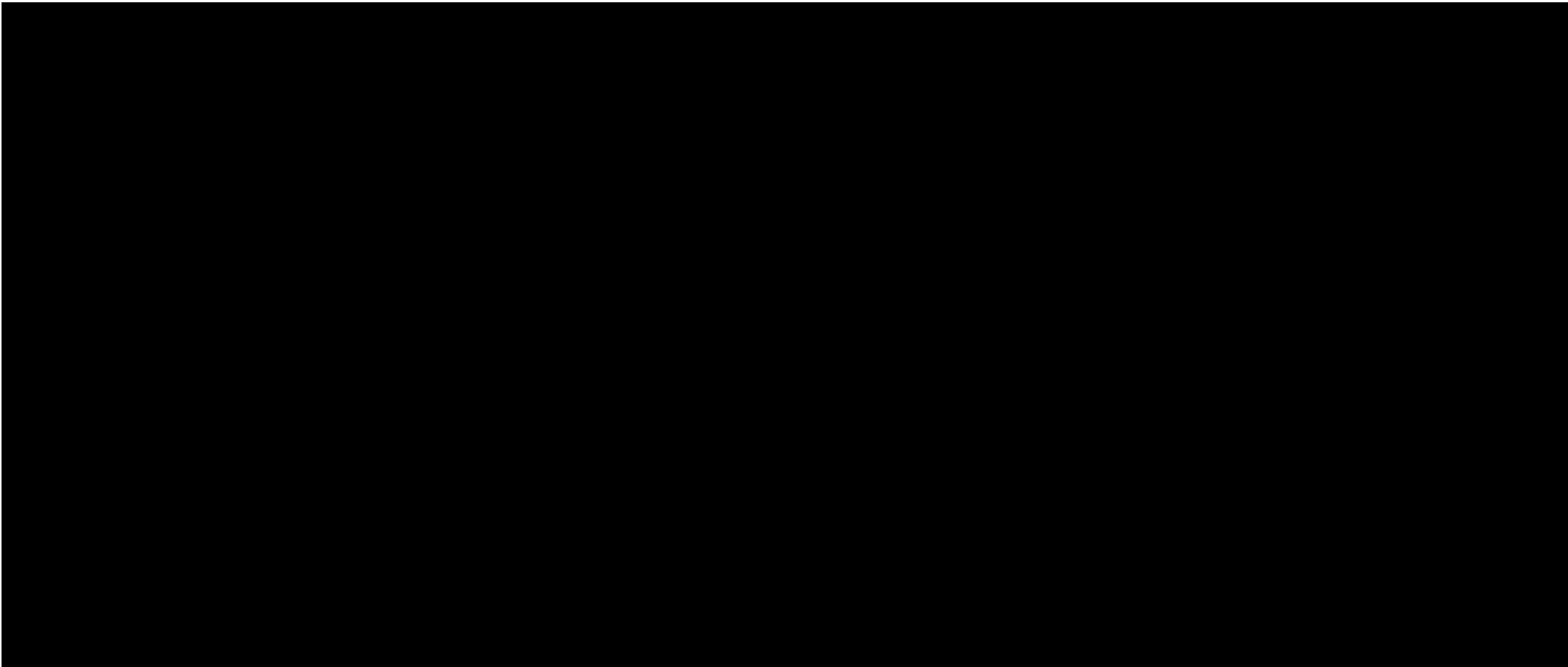
Option D-3 - AIS and SF6 free extension of Kingsnorth 400 kV substation via x2 dedicated bays (x1 existing AIS and x1 SF6 free GIS [REDACTED] AIS bays within the SGT compound.

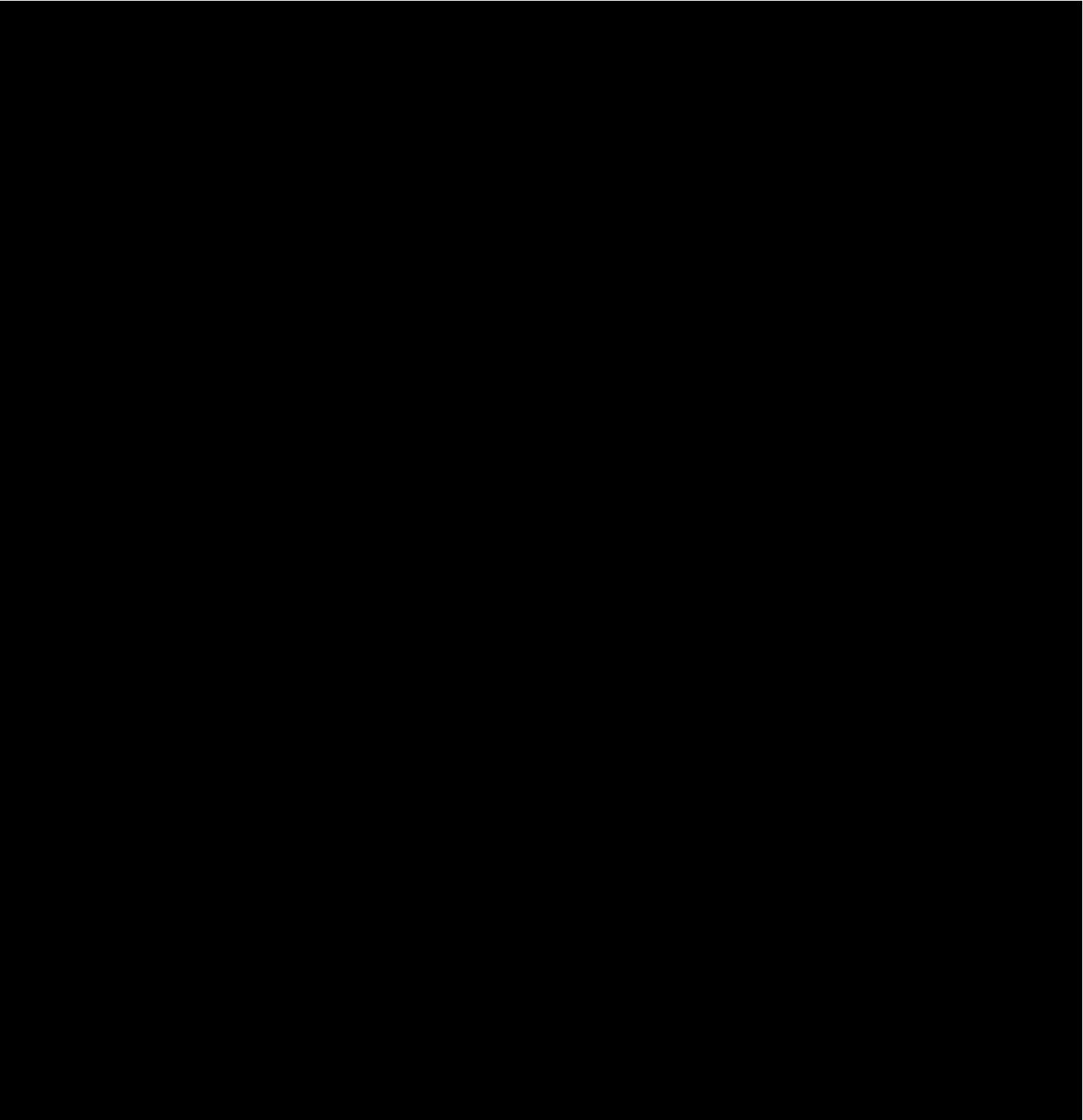
This option involves the installation of [REDACTED] SGTs that are connected to [REDACTED]

Initial optioneering and development of this option by FEED has confirmed that there is space adequate to house the SGT compound [REDACTED]

The scope of works for this option is listed as follows:







In appraising these two options, we undertook a proportionate, multifactor qualitative assessment to determine which option delivers the best overall outcome for consumers, while meeting the investment drivers.

4.5 Qualitative assessment of shortlisted options

Table 10 - Multifactorial analysis

Optioneering Categories					
Option	Engineering	Environmental	Deliverability	Economic/Consumer Value	Consenting /Stakeholder
Option D-2 Extend Kingsnorth 400 kV substation, SGTs.	Delivers against project drivers. [Redacted]	Option will be facilitated on brownfield site of former power station. Carbon footprint higher than D-3 [Redacted]	Project is deliverable [Redacted] and earlier than Option D-3. [Redacted]	Earlier connection date than Option D-3 [Redacted] enabling earlier connection of Data Centre, which underpin nearly all modern digital activity.	[Redacted]
	Both options have similar impact to the wider electrical system. [Redacted]	BNG value similar for both options as building on brownfield site.	System access low risk as most of the works are delivered offline with minimal proximity outages required.	Avoids asset stranding [Redacted]	Option takes up less land in the Medway development [Redacted]
	Benefit	Neutral	Benefit	Benefit	Benefit

Optioneering Categories					
Option	Engineering	Environmental	Deliverability	Economic/Consumer Value	Consenting /Stakeholder
Option D-3 Extend Kingsnorth 400 kV substation, [REDACTED] SGTs.	Delivers against the project drivers. [REDACTED] [REDACTED] Both options have similar impact to the wider electrical system.	Option will be facilitated on brownfield site of former power station. In isolation a lower carbon footprint than Option D-2. [REDACTED] [REDACTED] [REDACTED] BNG value similar to D-2.	Delivery date would be beyond [REDACTED] [REDACTED] System access low risk as most of the works are delivered offline with minimal proximity outages required.	Later connection date than Option D-2 [REDACTED] leading to later connection of Data Centre, which underpin nearly all modern digital activity. Leads to stranded [REDACTED] assets which cannot then be used elsewhere on the network to the benefit of consumers.	Reserved Matters (RM) Application and is subject to 46 outline conditions. Customer is providing land at no cost. Option would holistically take up more land either within the Medway development or outside its boundary due to the required 132 kV substation and additional stepdown SGTs.
	Neutral	Neutral	Detractor	Detractor	Benefit

4.6 Qualitative assessment output

Overall, the assessment indicates that **Option D-2** is preferred due to:

earlier connection to transmission network

lower programme risk

- better alignment with customer requirements,
- greater operational resilience than
- avoids additional infrastructure

lower holistic environmental impacts

4.6.1 PASE Alignment

The preferred solution is a PASE Variant in accordance with Ofgem's Load Re-opener Guidance and Submission Requirements.

4.7 Quantitative analysis of shortlist options

4.7.1 Cost estimates of shortlist options

To assess the shortlisted options, cost estimates have been created for quantitative economic comparison. All capex costs are derived from NGET's latest Cost Book (23/24 prices). Estimating Units Lines (EULs) have been used to generate cost estimates based on the scope of work and the new assets to be acquired for each option. For each EUL, based on historic project analysis, to account for unforeseen circumstances and to mitigate risks during implementation.

Table 11: Cost Estimate Breakdown

Option D-3 is lower cost than Options D-2. The main cost drivers are listed in 4.7.1.2. Main differences driving increased costs in D-2 are the

[REDACTED]

4.7.1.1 Connection assets and Infrastructure assets

The majority of assets proposed for Options D-2 and D-3 will be classified [REDACTED]

[REDACTED]

[REDACTED]

4.7.1.2 Cost drivers

The project's cost estimates are based on current market conditions, with ongoing work to refine requirements.

Using the cost book, the main factors driving the costs for the shortlisted options are:

[REDACTED]

4.7.2 Cost Benefit and Analysis

4.7.2.1 Purpose and Approach

Our Cost Benefit Analysis (CBA) evaluates the economic efficiency and consumer value of the proposed transmission investments. This analysis aligns with Ofgem's Load Re-opener Guidance and Submission Requirements.

The CBA process integrates monetised benefits such as constraint cost savings, system efficiency improvements, and consumer bill impacts, alongside a comprehensive Whole-Life Cost Analysis (WLCA) that captures capital expenditure, operational and maintenance costs, replacement cycles, carbon impacts, and future extendibility. This dual approach ensures a balanced assessment of both short-term economic benefits and long-term cost efficiency, avoiding the risk of asset stranding or future inefficiencies.

Our CBA considers:

- Robust optioneering and sensitivity testing: We have evaluated credible alternatives, including 'do nothing' and 'do minimum' scenarios, to confirm that the preferred solution delivers the optimal balance of technical performance, environmental impact, and economic benefit.
- Quantification of constraint cost reductions: Using system operator modelling outputs and historical data, we quantify expected savings from reduced system constraints, which translate into direct consumer bill benefits.
- Assessment of delay impacts: The financial consequences of potential project delays on constraint costs and consumer bills are modelled through risk-adjusted scenarios, providing a clear understanding of the value of timely delivery.
- Inclusion of socio-economic benefits: Where quantification is challenging, qualitative evidence supported by stakeholder engagement and regional development plans highlights the wider economic benefits, including job creation and inward investment.

- Consideration of non-monetised benefits: We explicitly identify benefits that are qualitative or not readily monetisable, such as enhanced system operability, resilience, and environmental improvements, ensuring full transparency of the value proposition.
- Alignment with policy and government targets including Net Zero and AI Growth Zones: The CBA reflects the influence of national and local policies, including Clean Power 2030, net zero commitments, and economic growth plans demonstrating how the investment supports the broader energy transition.

We have assessed consumer value by comparing the whole-life costs and benefits of five shortlisted connection and substation delivery options using Ofgem’s RIIO-ET3 CBA template. The assessment is completed relative to a counterfactual and on a discounted basis over a 50-year appraisal period (2027–2076), consistent with the CBA methodology.

For each option considered, we have quantified:

- (i) Initial CAPEX investment required
- (ii) Future end of life replacement costs

The supporting CBA model quantifies the costs and benefits for this project. Using the Ofgem RIIO-ET3 CBA template spreadsheet, the CBA compares the discounted cost and benefits for consumers for the following two shortlisted options.

Option D-2 - Extend Kingsnorth 400 kV substation, [REDACTED]

Option D-3 - Extend Kingsnorth 400 kV substation, [REDACTED]

4.7.2.2 CBA Outcomes

Lifetime Cost-Benefit Analysis: The lifetime costs and benefits refer to a 50-year period starting from 2027 until 2076.

Table 12: Lifetime Cost-Benefit Analysis (2023/2024 base prices, central carbon pricing, discounted values)

[REDACTED TABLE CONTENT]

On the basis of the discounted lifetime CBA results (Table 12), Option D-3 delivers the highest NPV [REDACTED]. Option D-2 delivers a NPV [REDACTED]. However, Option D-2 is our preferred option due to the preferable delivery timeline, alignment with customer specifications and avoidance of asset stranding, further details are provided in section 4.7.3. This analysis is subject to confirmation through deliverability, consents/land, outage and risk considerations, and any CBA sensitivities set out in the assumptions below.

4.7.2.3 Assumptions of the CBA analysis

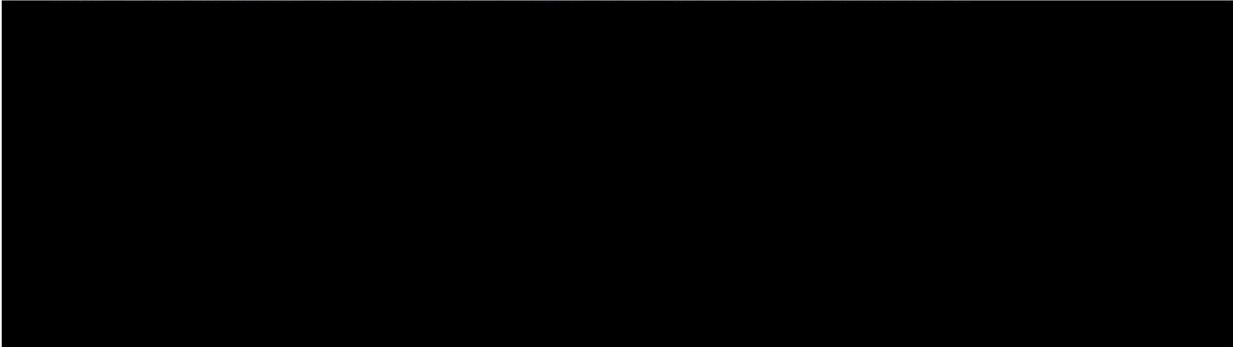
Core assumptions and sensitivities. The CBA results are based on the following high-level assumptions (with sensitivities used to test robustness where appropriate):

- Appraisal period of 50 years (2027–2076), with costs and benefits discounted and presented relative to the counterfactual.
- Cost base: 2023/2024 prices, aligned to the Ofgem RIIO-ET3 CBA template inputs (including treatment of replacement CAPEX and maintenance).
- Carbon: central base case carbon price applied for monetising construction carbon, SF6/alternative gas leakage and losses, with scenario testing for alternative carbon price trajectories.

- Benefits scope applied consistently across options; where option-specific benefits exist (e.g. constraints), the basis and evidence are documented and applied consistently.
- Key sensitivities considered (as applicable): timing/phasing, CAPEX uncertainty ranges, delivery/outage risk, and benefit parameter uncertainty (including losses and leakage assumptions).

4.7.2.4 Costs

Table 13: Summary of all additional Capex costs (2023/2024 base prices)



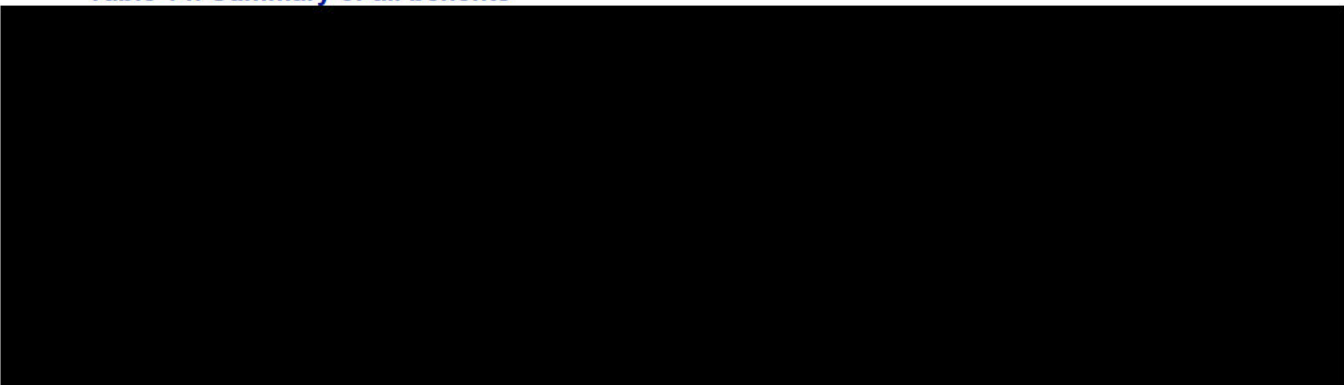
4.7.2.4 Benefits

The following benefits have been included within the CBA:

- SF6 / Alternative gas leakage reduction
- Carbon cost of construction reduction
- Transmission loss reduction
- Summary of all Benefits

Table 14 presents the summary of all (undiscounted) benefits, including environmental and non-environmental benefits, considering the central base case carbon price.

Table 14: Summary of all benefits



4.7.3 Project Benefits and Outputs

While Option D-3 offers a higher NPV, our qualitative multifactorial analysis, [REDACTED] and the alignment with customer requirements support our recommendation to proceed with **Option D-2**. It effectively addresses the following considerations:

- It provides a compliant [REDACTED] demand capacity and [REDACTED] connection.

[REDACTED] It avoids the provision of additional headroom [REDACTED] above the connection request, which offers no additional benefit to the consumer and therefore mitigates asset stranding [REDACTED]

[REDACTED] Holistically, it minimises the substation footprint, and knock on environmental impacts, which are increased for Option D-3 [REDACTED]

[REDACTED] It provides additional redundancy for the customer [REDACTED]

[REDACTED] It provides for an earlier customer connection [REDACTED]

[REDACTED] our assessment demonstrates that extending Kingsnorth represents the lowest-regret and most proportionate response to the confirmed and time-critical customer need. The optioneering has explicitly considered a new-build solution and alternative system locations; however, these options would entail materially higher upfront cost, additional land and consenting risk, and delivery timescales [REDACTED]. While Option D-3 delivers a higher quantified NPV, this reflects the provision of capacity materially in excess of the customer's requirement and increased risk of asset stranding. In contrast, Option D-2 balances timely delivery, alignment with customer requirements, proportionate capacity provision and comparable infrastructure exposure to consumers. Taken together, we consider Option D-2 to represent the most efficient whole-life outcome for consumers when deliverability, risk, and system integration are assessed alongside economic metrics, consistent with Ofgem's expectations for proportionate, needs-led investment under the Load Re-opener.

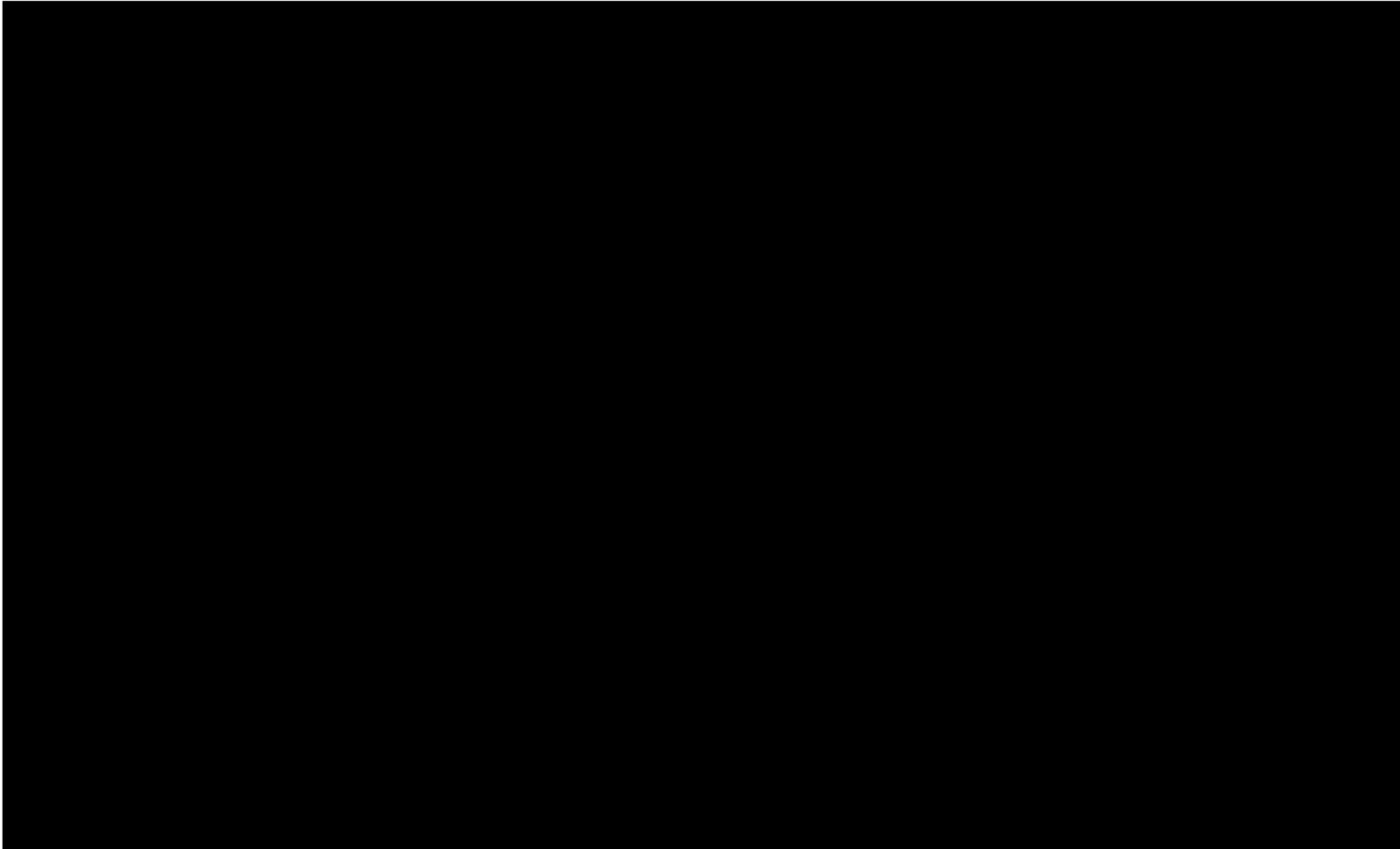
4.7.4 Future Proofing

[REDACTED]

5. Project Delivery

We plan for the scheme to enable the customer connections [REDACTED]

[REDACTED] A high-level indicative mapping of the project is provided in Figure 13. Site surveys have been carried out as per our schedule and do not indicate any substantial issues likely to delay project timelines or require changes to the preferred solution.




5.1 Procurement and Contracting Strategy

Our preferred procurement strategy is [REDACTED]

While our initial preference would be the use of the newly instigated Electricity Transmission Partnership (ETP), which was launched in September 2025, [REDACTED]

[REDACTED]

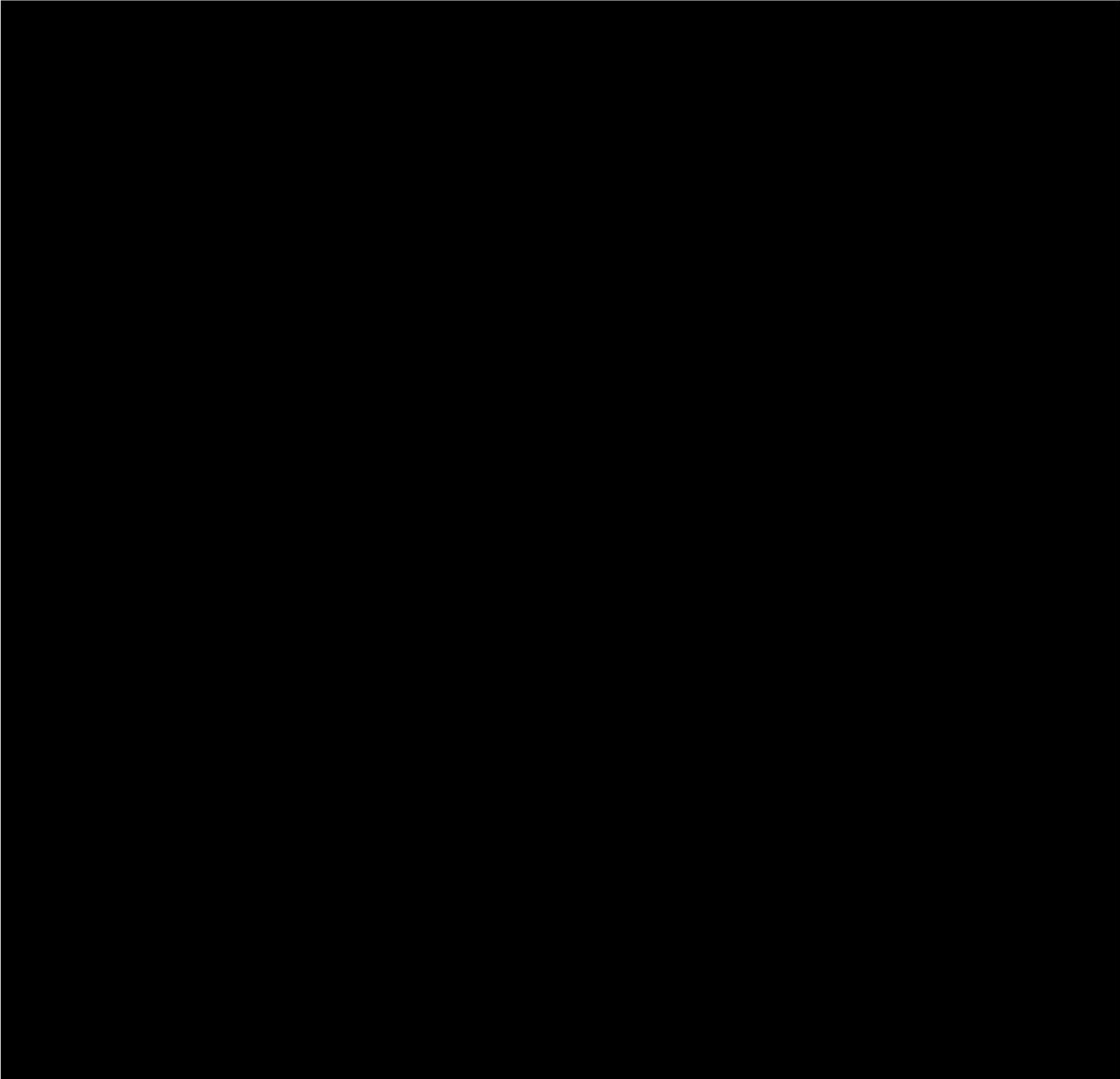
[REDACTED]



Further details on our procurement approach and chosen supplier will be contained within the Project Assessment.

5.2 Risk and risk Management

Current indicative risks are provided below. The risks will evolve as the project progresses and an updated risk register, informing contingency allowances sought in the Project Assessment, will be provided with that submission.



6. Conclusion

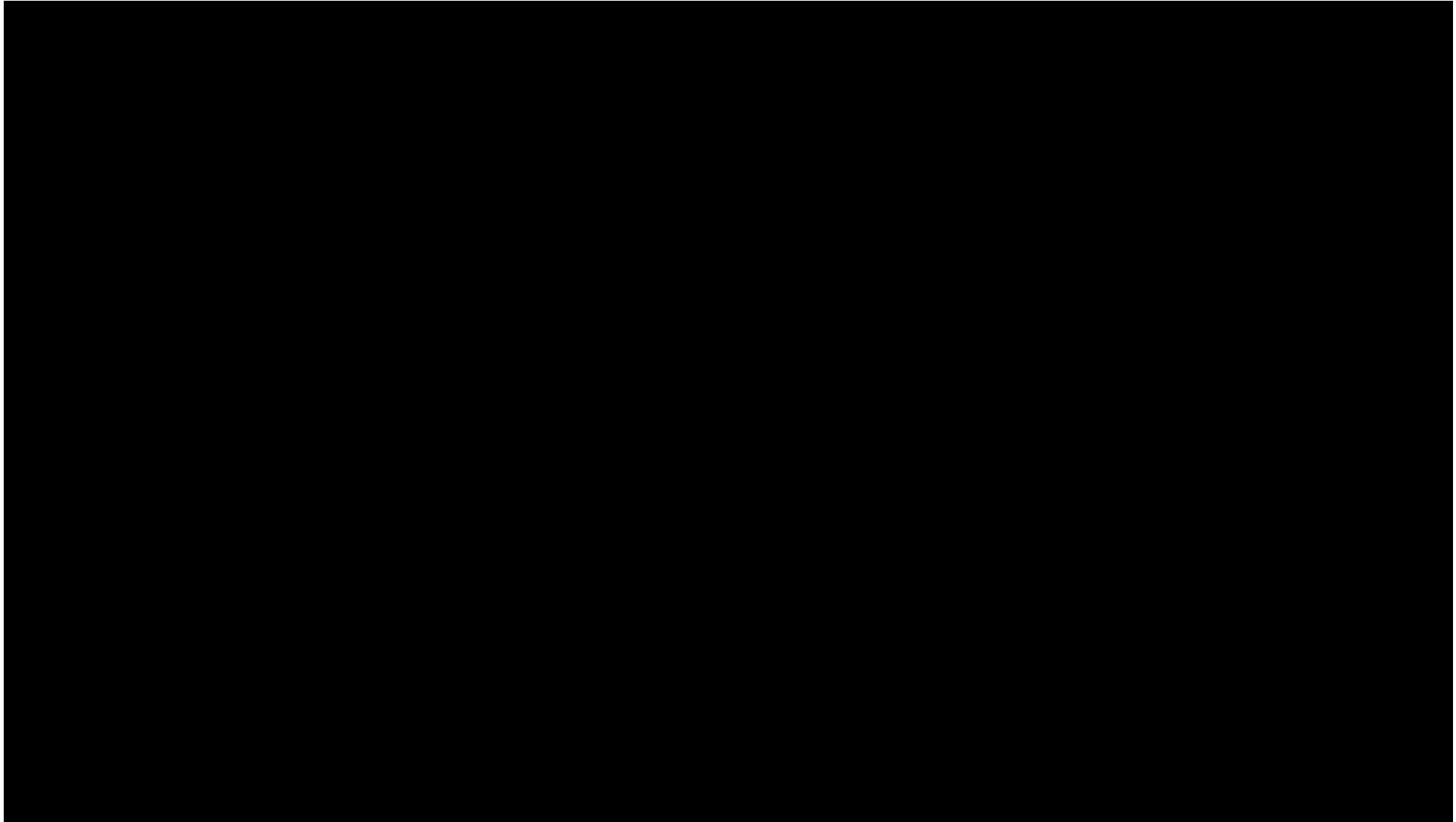
This submission outlines a preferred solution to satisfy the investment drivers. It seeks confirmation of eligibility under Special Condition 3.18, confirmation of eligibility for PCF under Special Condition 3.15, confirmation of re-opener Track 2 EL and formal approval of the Needs Case and preferred solution. It outlines the investment needs case for extension of the Kingsnorth 400 kV AIS substation and a new [REDACTED] SGT compound. The paper describes the outputs from the optioneering and CBA process that led to the identification of the preferred solution. The drivers for this investment are [REDACTED] demand.

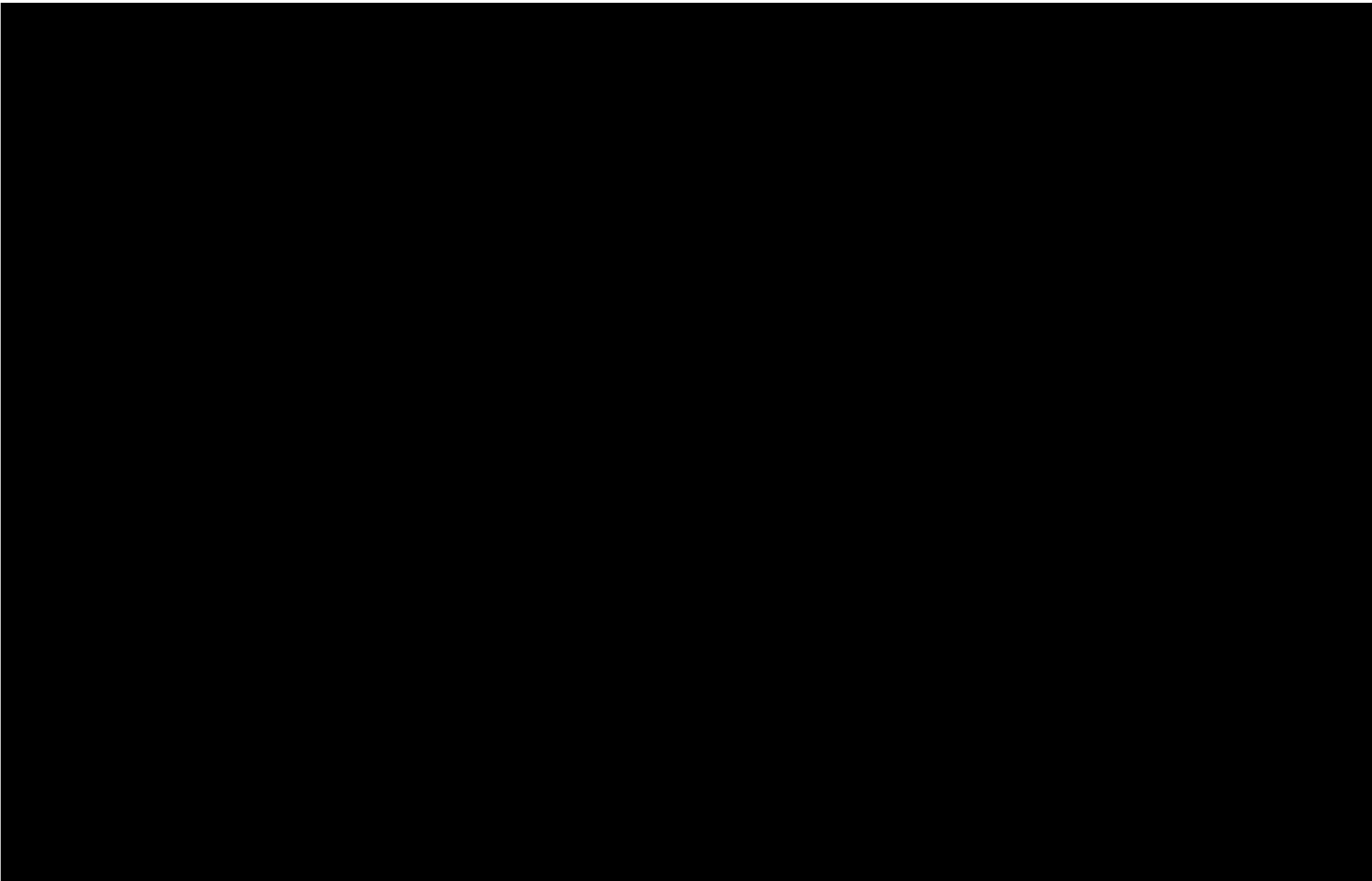
The proposed solution is Option D-2. Whilst this has a lower NPV comparative to Option D-3, when considering the up-front capex cost of both investments [REDACTED] costs between options are near comparable. Beyond economic considerations Option D-2 is also preferable because it enables earlier delivery, lower programme risk, better alignment with customer requirements, has greater operational resilience, avoids additional infrastructure and therefore lower holistic environmental impacts.

Table 16 - Investment Summary

Main Drivers	The driver for this investment is load related to provide a transmission connection at Kingsnorth 400 kV substation for [REDACTED] a data centre.
Selected Option	Our preferred option is Option D-2 which involves the installation of [REDACTED]. An SGT compound will be sited [REDACTED] AIS bays as part of our scope of works.
Estimated Cost & Timing	<p>Total forecasted expenditure [REDACTED]</p> <p>Timing of Investment:</p> <p>[REDACTED]</p>
Outputs	<p>The preferred option will enable the following outputs:</p> <ul style="list-style-type: none"> Population of an AIS 400 kV bay at the existing Kingsnorth 400 kV substation. [REDACTED] Population of an SF6 Free GIS 400 kV bay [REDACTED] [REDACTED] installation of [REDACTED] SGT in [REDACTED] Construction [REDACTED] AIS bays for the contracted customer to connect [REDACTED] Connection of [REDACTED] demand data centre at Kingsnorth 400 kV substation. <p>We propose a Price Control Deliverable for this investment relating to the delivery of the works as follows:</p> <p>Extension of Kingsnorth 400kV substation by [REDACTED]</p>

Appendices





Appendix 2– Glossary

Abbreviation	Description
ACL	Available For Commercial Load
ACSR	Aluminium Core Steel Reinforced
AIS	Air Insulated Switchgear
APM	Advanced Procurement Mechanism
BESS	Battery Energy Storage System
BP	Business Plan
BPDT	Business Plan Data Template
CAI	Closely Associated Indirect
CBA	Cost Benefit Analysis
CPO	Compulsory Purchase Order
CSNP	Centralised Strategic Network Plan
DC	Direct Current
DCO	Development Consent Order
DC TC	Direct Current Time Constraint
DESNZ	Department for Energy Security and Net Zero
DISC	Disconnecter
DLR	Docklands Light Railway
DNO	Distribution Network Operator
ECC	Estimated Cost of Construction
EEW	Early Enabling Works
EJP	Engineering Justification Paper
EoL	End-Of-Life
ESO	Energy System Operator
ET	Electricity Transmission
EU	European Union
EUL	Estimating Units Lines
ESW	Earth Switch
FEED	Front End Engineering Design
FES	Future Energy Scenarios
FY	Financial Year
G3	Green Gas for Grid
GEC	General Electric Company
GIB	Gas Insulated Busbar
GIS	Gas Insulated Switchgear
GLA	Greater London Authority

Abbreviation	Description
GW	Giga Watt
HDD	Horizontal Directional Drilling
HV	High Voltage
HWUP	Hackney Waltham Cross Upgrading
IEC	International Electrotechnical Commission
kW	Kilo Watt
LLTI	Long Lead Time Items
LTDS	Long-Term Development Statement
LV	Low Voltage
LVAC	Low Voltage Ac
M&E	Mechanical And Electrical
MITS	Main Interconnected Transmission Systems
MSIP	Medium Sized Investment Project
MVA	Megavolt-Amperes
MW	Mega Watt
NESO	National Energy System Operator
NETS	National Electricity Transmission System
NG	National Grid
NGED	National Grid Electricity Distribution
NGET	National Grid Electricity Transmission
NOA	Network Options Assessment
NOMs	Network Output Measures
NPV	Net Present Value
OHL	Overhead Line
ORPS	Obligatory Reactive Power Service
PCD	Price Control Deliverables
PCF	Pre-Construction Funding
SF6	Sulfur Hexafluoride
SGT	Super Grid Transformer
SLD	Single Line Diagram
SPV	Special Purpose Vehicle
SSMD	Sector Specific Methodology Document
SSSI	Site of Special Scientific Interest
STC	System Operator Transmission Owner Code
SuDS	Sustainable Drainage Solutions
TBC	To Be Confirmed
tCO2e	Tonnes of Carbon Dioxide Equivalent
TCPA	Town And Country Planning Association

Abbreviation	Description
TCSNP	Transitional Centralised Strategic Network Plan
TWB	Through-Wall Bushing
UK	United Kingdom
UKPN	UK Power Networks
UKPN EPN	Eastern Power Networks
UKPN LPN	London Power Networks
UKPNS	UK Power Networks Services
UXO	Unexploded Ordnance
VCA	Voltage Compliance Assessment
XPLE	Cross-Linked Polythene

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