

nationalgrid

R110-T3



**Aberthaw 275/132 kV Site Strategy
LRR Eligibility Letter – 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	Aberthaw 275/132 kV Site Strategy
TO's preferred re-opener track	Track 2 Eligibility Letter (EL), in line with this investments' strategic status within an identified AI Growth Zone, and its bespoke arrangements with Ofgem for inflight investments.
RRP References	██████████
BPDT / Project Reference Number	██████████
Load Board Reference	██████████
Investment Driver	<p>The project consists of two primary investment drivers:</p> <ul style="list-style-type: none"> • Customer connections: ██████ new strategic demand (data centre) drivers, Distribution Network Operator growth and ██████ generation (PV) are contracted to connect at Aberthaw. • Asset health: existing Aberthaw 1950s and 1960s substations require significant outages and capital investment to address aged assets.
PASE Compliance	<p>The preferred solution for this investment is option E-4: a new GIS 275 / 132 kV substation.</p> <p>The PASE guidance doesn't consider 275 kV infrastructure therefore this investment cannot be assessed for PASE compliance. However, should in future, PASE expand to cover 275 kV infrastructure then this investment would comply as a variant option as an Indoor Double Busbar GIS in close proximity to the coast.</p> <p>More detail on PASE compliance is provided in section 4.5.1.</p>
Outputs	Construction of a new double busbar, 275 kV GIS substation with ██████ SGTs to feed a new NGET infrastructure double busbar, 132 kV GIS substation and a new NGED double busbar 132 kV GSP. All existing circuits will be transferred from the existing legacy Aberthaw sites, with the legacy assets decommissioned.
Short list of strategic options considered	<p>The shortlisted options for Aberthaw 275/132 kV are:</p> <ul style="list-style-type: none"> • Option D-1: Do minimum works, utilising spare bays at existing AIS substation • Option E-2: New substation build, non-SF6 GIS, cabled to existing OHL towers (assuming local site) • Option E-4: New substation, non-SF6 GIS, OHL realignment to the rebuilt substation • Option E-6: Prioritisation of 132 kV non-SF6 GIS rebuild, with a delayed 275 kV build

Field	Description						
Preferred solution and explanatory narrative on the rationale	<p>The preferred solution for this project is option E-4: a new GIS 275 / 132 kV substation.</p> <p>This option accommodates all the drivers specified in the scope of works:</p> <ul style="list-style-type: none"> • Supports the timely delivery of customer connections, whilst minimising programme risk; and • Asset health challenges associated with the existing substations. <p>GIS has been selected due to the coastal location (~0.5km proximity to the coast) and the option's consenting and deliverability advantages, minimising land take and environmental/stakeholder impacts while enabling an offline rebuild that resolves legacy asset-health/operability constraints and provides robust futureproofing for contracted connections.</p>						
Expected Forecast Costs	Estimated capital cost: [REDACTED] (23/24 prices, inc. Risk & contingency)						
Delivery Year	<p>The delivery milestones for this project are:</p> <ul style="list-style-type: none"> • October 2031: Initial energisation [REDACTED] • October 2032: Secondary energisation [REDACTED] • October 2033: Final energisation, completion of circuit transfers and DNO transfer <p>Dates are subject to procurement, contractor programme and confirmation of DNO programme.</p>						
Applicable Reporting Tables	BPDT 10.5 ET Pipeline log and RRP 2024-25 E1.11_ET Pipeline Log						
Historic Funding interactions	<p>We've carried out interventions on various assets within Aberthaw 275/132 kV substation during RIIO-ET1 and RIIO-ET2 and recovered [REDACTED] (18/19) in allowances. More information on asset health works to date are set out in chapter 3.2.</p> <p>There have been no allowances awarded to date for this investment.</p>						
Interactive Projects	<p>The [REDACTED] is an interactive project to the Aberthaw 275/132 kV Site Strategy.</p> <p>System access is currently planned considering all interactive outages and proactive project development choices to reduce the interactivity have occurred.</p>						
Spend Apportionment	<table border="1"> <tr> <td>T2 (FY 2022- 2026)</td> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> <tr> <td>[REDACTED]</td> <td>[REDACTED]</td> <td>[REDACTED]</td> </tr> </table>	T2 (FY 2022- 2026)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
T2 (FY 2022- 2026)	[REDACTED]	[REDACTED]					
[REDACTED]	[REDACTED]	[REDACTED]					

1. Executive Summary

1.1 Project Summary

Aberthaw is a RIIO-ET3 load-driven reinforcement and asset replacement project that will enable the timely connection of low-carbon generation, storage, and demand customers in the South-Wales region, while increasing capacity and operability at a strategically important transmission node.

It will support decarbonisation and wider net zero objectives, and support CP2030 by enabling large-scale BESS connections. The investment also preserves future extendibility at the site through spare capacity and safeguarded layout provisions.

1.2 Submission Purpose

This Eligibility Letter and associated Cost-Benefit Analysis (CBA) are being submitted as part of the RIIO-ET3 Load Re-opener (LR) mechanism under Special Condition 3.18 (Load Re-opener and Price Control Deliverable) of the Electricity Transmission Licence Conditions. This submission seeks confirmation that the Aberthaw 275/132 kV Site Strategy investment is eligible for assessment under the Load Re-opener.

We are also seeking confirmation that Track 2 EL is the appropriate route for this project, approval of Pre-Construction Funding (PCF) and approval for the needs case and our preferred solution.

1.3 Need

The Aberthaw 275/132 kV Site Strategy sits within the South Wales regional network strategy to enable near-term, contracted growth on the 275 kV network and to strengthen the transmission–distribution interface at a critical 132 kV supply point for Cardiff and the Vale of Glamorgan. The project is driven by contracted customer connections, including [REDACTED] strategic demand (data centre) customers, Distribution Network Operator (NGED) growth and [REDACTED] generation (PV) connection.

At a high level this investment is progressing against three strategic contexts which are each carrying different levels of uncertainty. These are set out below.

- **Delivering for our customers:** Strategic demand customers are a key driver for this investment; they are central to the regional growth agenda (including the South Wales AI Growth Zone) and require timely, secure 132 kV supply supported by appropriate transmission and distribution interface reinforcements. There is some uncertainty regarding future reform of strategic demand [REDACTED]
- **Developing the network during reform:** Connections Reform is, however, introducing uncertainty in the wider future customer landscape at Aberthaw, particularly as generation and storage projects progress through the revised gate criteria. Section 3.1 of this investment paper sets out the current best-view of the customer position and how Connections Reform has introduced a new option to consider as part of a look back and check on our optioneering assessment.
- **South Wales regional strategy:** Current regional studies and the prevailing strategic context do not identify a present driver to uprate Aberthaw to 400 kV. The required outcomes can be delivered by reinforcing and renewing the 275/132 kV site while preserving optionality to accommodate future network evolution if required. Appended to this submission is a copy of the South Wales Regional Strategy which sets out more detail on the regional studies undertaken to satisfy ourselves that there is no current driver to uprate the network. We cannot not say, however, that there will not be a future need to add additional capacity to the network in South Wales (between 2035 – 2050) and therefore a key focus of the strategy has been to explore what future optionality exists should a driver emerge post 2035 with these investments delivered.

The asset health of the site supports a rebuild at Aberthaw. Site information confirms that the age and condition of both the 132 kV and 275 kV indoor AIS (1957 and 1965) would require increasing levels of intervention to maintain future safe and reliable operation. The emergence of the customer drivers has changed our approach from planning standalone, piecemeal replacements to managing the site on an interim risk-based basis that protects safety and operability while avoiding inefficient spend that would be stranded by the rebuild. In practice, we have prioritised monitoring and targeted mitigations for the highest-risk assets (and planned enabling/outage strategies accordingly), while coordinating the rebuild programme and asset health data to address the underlying end-of-life constraints in a single coordinated intervention alongside the load-driven scope.

In summary, while there is uncertainty in the wider future customer landscape as Connections Reform is implemented, the need to invest at Aberthaw is clear and time critical. Contracted strategic demand customers have defined requirements and delivery dates that must be met, and the existing asset base is ageing and increasingly risk-exposed; progressing the rebuild now is therefore the least-regret approach to maintain safety and operability, meet our contractual and licence obligations, and provide a robust platform for future network evolution.

1.4 Optioneering to date

We undertook a structured, multi-factor optioneering process to identify a proportionate and deliverable consumer-solution in the interests of consumers. We first considered a range of strategic options, being do-nothing, market-based, whole-system, reuse existing or extension of existing assets, and new-build. From these, we build a longlist of eleven options, from which we shortlisted four for detailed analysis. These detailed options focused either on do-minimum works through utilising spare bays at the existing substation, or new-build.

Of these, Option E-4 is our preferred solution because it balances deliverability, futureproofing, consumer value and asset health needs, while avoiding the limitations and risks associated with refurbishing the existing site, extensive cabling or a more complex staged rebuild.

Table 1: Summary of optioneering longlist

Option	Details	Drivers met?	New site?	AIS/ GIS?	Short List?
Option A	Do nothing	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	Utilise existing AIS substation with 'do minimum' approach	Yes	No	AIS	✓
Option D-2	Utilise existing AIS substation, whilst providing a GIS or AIS extension for additional bays	No	No	AIS/GIS	X
Option E-1	New substation build, AIS, cabled to existing OHL towers	Yes	Yes	AIS	X
Option E-2	New substation build, GIS, cabled to existing OHL towers	Yes	Yes	GIS	✓
Option E-3	New substation, AIS, OHL realignment to the rebuilt substation	Yes	Yes	AIS	X
Option E-4	New substation, GIS, OHL realignment to the rebuilt substation	Yes	Yes	GIS	✓
Option E-5	New GIS substation – minimal land take. Phased build to allow for the demolition of old 275 kV and rebuild 132 kV in place	Yes	Yes	AIS	X

Option	Details	Drivers met?	New site?	AIS/ GIS?	Short List?
Option E-6	New GIS substation – minimum land take. Phased build to allow for demolition of old 132 kV first	Yes	Yes	GIS	✓ *
Option E-7	New substation, transmission voltage built at 400 kV, interbus transformers provided locally.	No	Yes	GIS	X
Option E-8	New substation, transmission voltage built at 275 kV, 400 kV interbus transformers provided locally or remotely.	Yes	Yes	GIS	X

**Option E-6 progressed to the shortlist post-connections reform because the loss of two 275 kV generation drivers has decreased the gains seen from cost of carbon from displaced generation, shifting the focus toward strategic demand and 132 kV delivery, making a phased solution that prioritises the 132 kV GIS rebuild more credible, lower risk upfront and better aligned with the revised project drivers.*

1.5 Cost Estimates

Based on the latest Cost Book (which we have then rebased into 2023/24 prices) and early project estimates, the preferred option, Option E-4, has an estimated total cost of [REDACTED] including risk and contingency.

The cost (23/34) for other shortlisted options (including risk and contingency) are:

- Option D-1: [REDACTED]
- Option E-2: [REDACTED]
- Option E-6: [REDACTED]

1.6 Indicative Delivery Programme

The project is currently planned for staged delivery between [REDACTED], with key outputs aligned to customer connection dates. The summary delivery milestones are Stage 1: [REDACTED]
 Stage 2: [REDACTED] and Stage 3: [REDACTED]

2. Introduction

2.1 Aberthaw 275/132 kV Site Strategy

This paper presents our Eligibility Letter review under the Load Re-opener and Price Control Deliverable under Special Condition 3.18 for investment to rebuild 275/132 kV Aberthaw substation. Through this submission, we are seeking:

- Approval of the investment need and our preferred option (E-4), which is to build a new GIS 275/132 kV substation, connecting via overhead lines;
- Confirmation that the Aberthaw investment will be assessed as a Track 2 EL investment of the proposed Track 2 EL of the re-opener process, because Aberthaw was part of a pre-submission discussion on NGET's portfolio of in-flight projects; and
- Pre-Construction Funding (PCF) under Special Condition 3.15 (Pre-Construction Funding Re-opener, Price Control Deliverable).

The investment is driven by contracted connection requirements at Aberthaw, including PV, BESS and DNO demand, and is required to meet contractual completion dates [REDACTED]. The investment is also driven by asset health considerations, due to the aging original infrastructure of existing site.

Subject to Ofgem confirming eligibility, needs case and PCF applicability, we will continue development and intend to submit a Project Assessment in line with the re-opener process in the [REDACTED] window.

2.1.1 Eligibility, Track & PASE

Aberthaw is driven by contracted customer connections, which cannot be accommodated at the 275/132 kV existing substation due to the aging original infrastructure which is approaching end of life. Continued investment in new connection assets within the existing 132 kV and 275 kV substations would lock consumers into substations with inherent reliability, safety, outage and maintainability risks over the notional life of the new plant, unless used only as a temporary transition to replacement substations. The investment is load-driven and triggered by contracted customer requirements and completion dates.

The proposed Track 2 allocation has been discussed with Ofgem. The PASE guidance does not include 275 kV infrastructure as a PASE aligned option, however, should in the future PASE expand to cover 275 kV infrastructure then this investment would comply as a variant option as an Indoor Double Busbar GIS near the coast. The track proposal has been discussed with Ofgem

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]

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.

[REDACTED]		
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]

2.2 Background

2.2.1 Chronology

The Aberthaw site has high customer interest which has triggered the need for a site strategy. Between [REDACTED], connection offers at Aberthaw exhausted spare bay capacity during [REDACTED], a holistic site strategy and siting study confirmed the case to rebuild and to coordinate a 132 kV split of the Cardiff distribution network, with all contracted customers aligned to the rebuilt site. The project passed Gate B¹ in September 2025 with early contractor input indicating a first ACL of [REDACTED] with FEED completing by [REDACTED] to enable planning and award of a [REDACTED].

Figure 1 provides the summary of chronology to the investment, while Table 4 provides a breakdown of the contracted customers' detail.

¹ Gate B refers to an internal governance checkpoint where projects must meet a set of criteria to pass from Early Development to Detailed Development (planning, sanction and supply chain).

2.2.2 Regional & Network context

Regional South Wales strategy

South Wales is expected to play a growing role in delivering UK clean power ambitions and significant economic growth. National Grid Electricity Transmission (NGET) is progressing a programme of transmission investment across [REDACTED] to maintain reliability, increase transfer capability, and enable substantial growth in both generation and demand. Post Connections Reform indications suggest a South Wales pipeline of approximately [REDACTED] [REDACTED] with a material share connecting into the [REDACTED]

Near term delivery is driven by this Aberthaw and Margam substation rebuilds on the 275 kV network, alongside targeted transformer and circuit upgrades (e.g., Whitson, Iron Acton/Melksham) and the Severn Cable Tunnel upgrade. These schemes are driven strategically significant industrial and economic development projects (e.g., the Tata Steel Margam/Port Talbot connection, and data centre and development zone demand dependent on Aberthaw).

To address Ofgem's concern regarding the potential for short term customer driven investments conflicting with longer term strategic network strategies we have developed a refresh of our regional strategy which has been submitted alongside this investment paper.

This fresh look at the network strategy integrates evidence from (i) customer triggered connection studies (near term statutory offers), (ii) Strategic Network Planning (SNP) analysis aligned to 2035 planning backgrounds, and (iii) Net Zero Engineering (NZE) stress testing extending toward 2050.

This combined approach tests compliance, operability and resilience under a range of credible futures, while recognising that electrical feasibility alone does not determine the optimal pathway (cost, deliverability, consenting, outages and customer impacts are material).

Across these analyses, the consistent near and medium-term signal is that South Wales can continue to operate effectively at 275 kV and deliver contracted connections out to at least [REDACTED] provided a proportionate package of targeted reinforcements and operational measures is implemented. [REDACTED]

NGET's current position is therefore that there is no clear technical or economic driver to progress widespread 400 kV uprating of the South Wales 275 kV network within the current planning horizon. [REDACTED]

As a result, committing prematurely to a 400 kV solution would risk higher consumer cost, increased delivery/consenting complexity, and potential delay to strategic customer connections in the absence of a clear needs case.

Reactive compensation requirements

[REDACTED]

Figure 2 – Location of the Aberthaw site on NGET's network

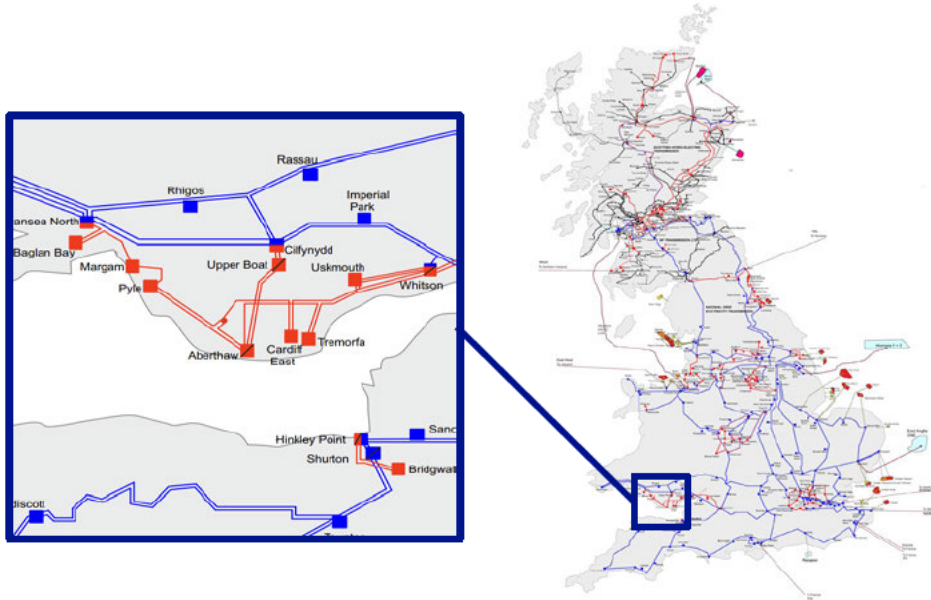
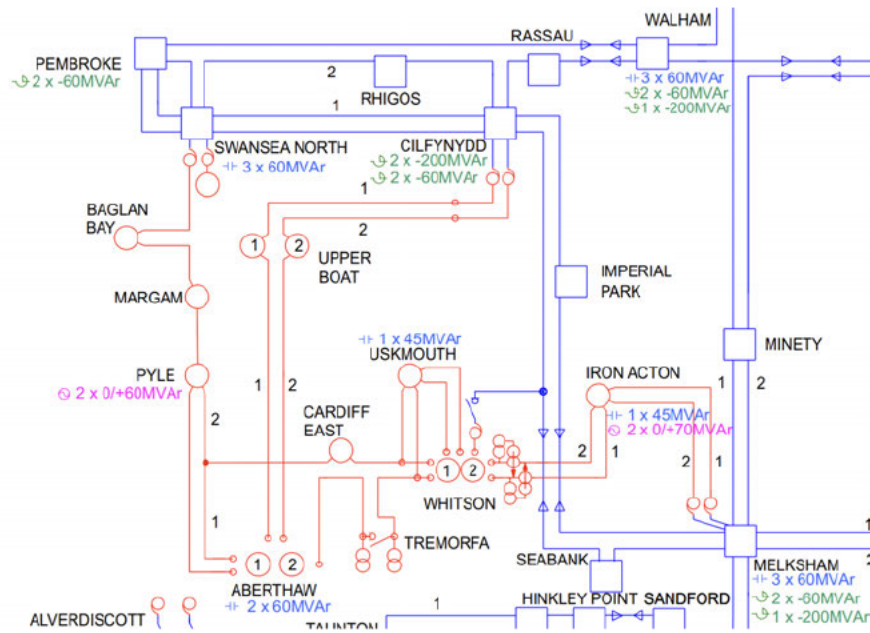


Figure 3 below provides a schematic illustration of the existing network in the South Wales region.

Figure 3 – Network configuration around Aberthaw



2.2.2.1 Interactive Projects

System access is currently planned considering all interactive outages and proactive project development choices to reduce the interactivity have

occurred. [REDACTED]

The Separation of Services scheme is currently completing separation works following the decommissioning of the former Aberthaw Power Station and disconnection of power station utilities. This work is expected to complete ahead of construction first site access, but will result in an early asset write off cost as outlined in section 2.2.4.1

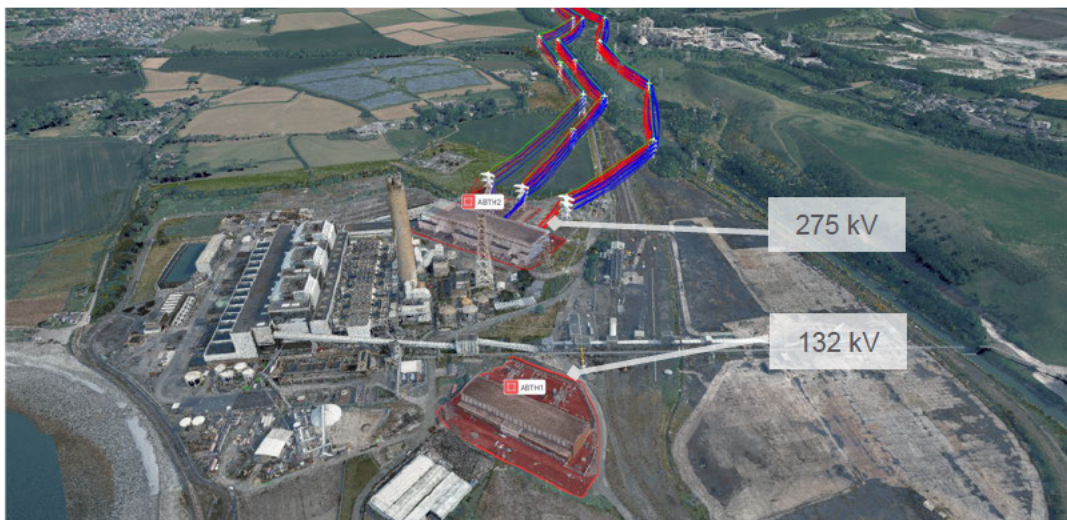
2.2.3 Site Background

The existing Aberthaw site is comprised of two indoor AIS sites, a 132 kV and 275 kV built in 1957 and 1965 respectively. The substations were designed to step up the generation voltage from the Central Electricity Generating Board (CEGB) Aberthaw Power Station which is sited between the two. Figure 4 below shows a satellite image of the Aberthaw site with the connecting OHL overlaid. The substations consist of:

- 275 kV [REDACTED] indoor AIS substation comprising [REDACTED]

- 132 kV [REDACTED] indoor AIS substation comprising [REDACTED]

Figure 4 – Aberthaw Substations and Surrounding Setting, with OHL model Shown (April 2025 Survey)



[Redacted]

[Redacted]

[Redacted]

[Redacted]


2.2.4 Historical Funding

We've carried out interventions on various assets within Aberthaw 275/132 kV substation during RIIO-ET1 and RIIO-ET2 and recovered [Redacted] (18/19) in allowances.

An overview of historic T1 and T2 asset health interventions for the Aberthaw 275 kV substation is presented in Appendix A.



2.2.4.1 Early Asset Write Off (EAWO)

The estimated remaining Regulated Asset Value (RAV), using our statutory Fixed Asset Register for these works, is 

3. Drivers & Needs Case

A significant customer driver for the Aberthaw investment is the [REDACTED]

[REDACTED] as triggered the requirement for more 132 kV capacity and uprating of all SG1s at Aberthaw.

However, there are a diverse range of other important investment drivers for Aberthaw – all of which are set out in table three below.

3.1 Customer

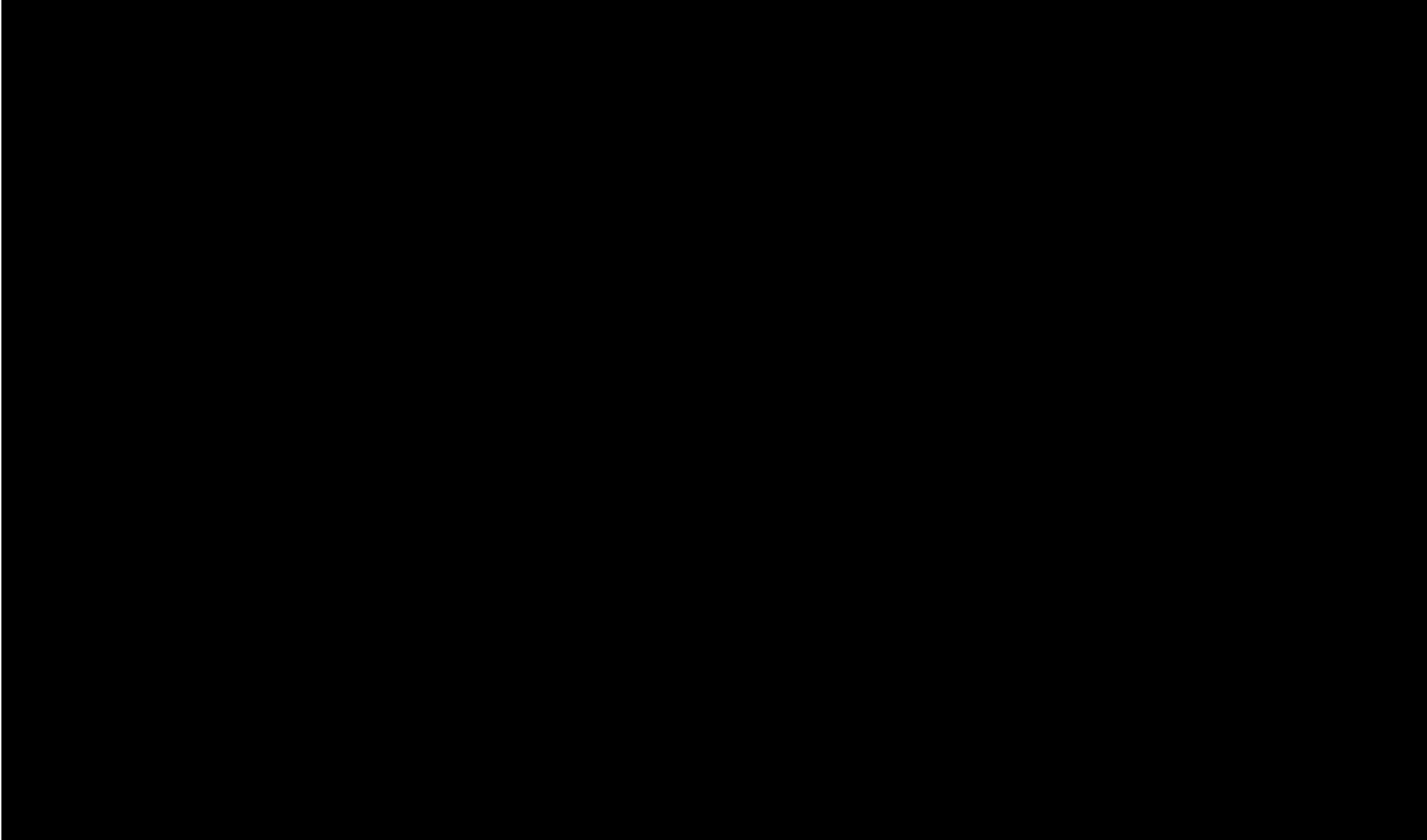
Table 4 below provides our latest view of the customer ACL dates which reflect the existing P6 programme. The testing and setting of ACL dates for customer contracts within scope of

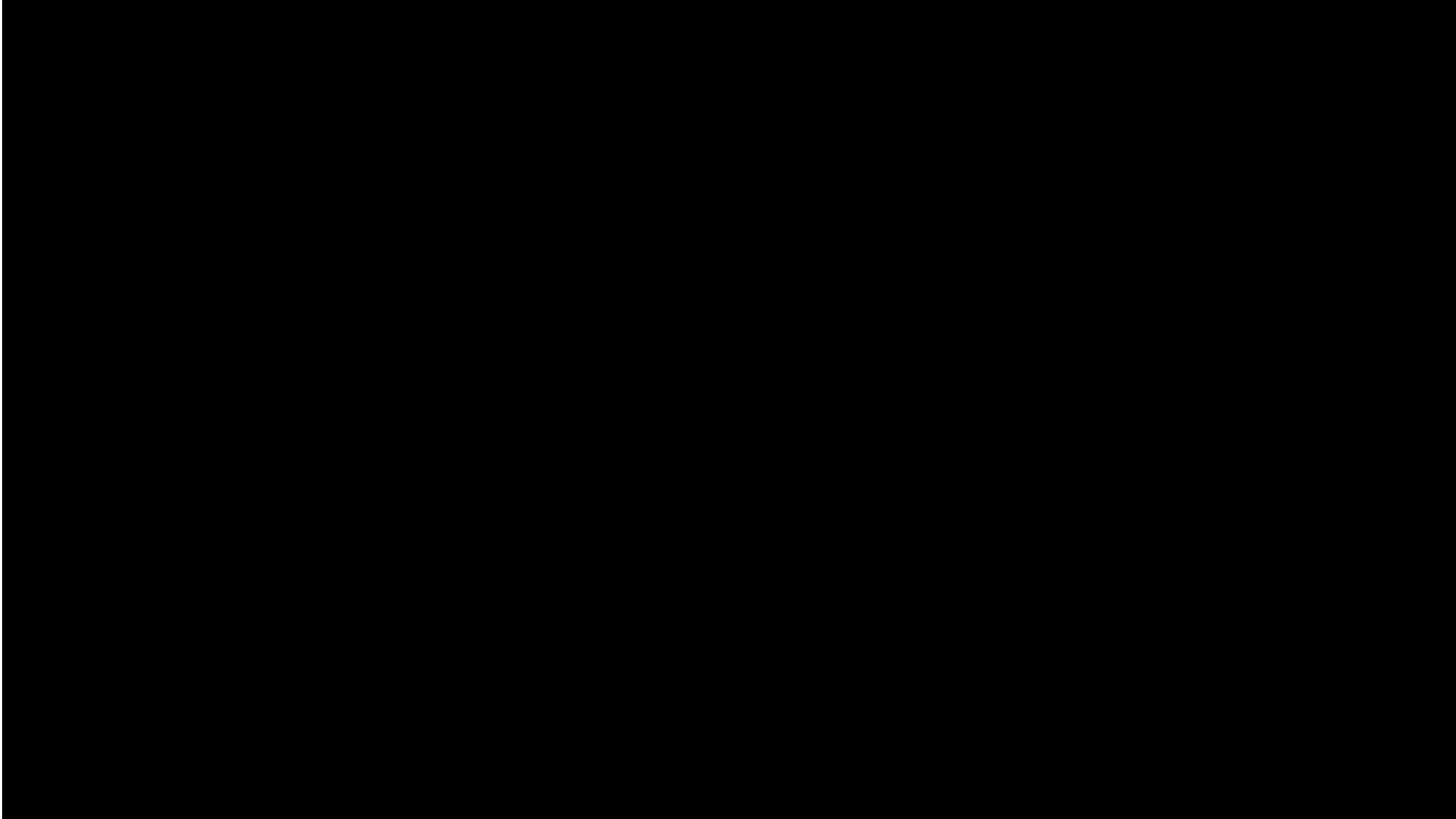
Connections Reform is ongoing throughout 2026. Confirmation of agreed ACL dates will therefore be presented in the next stage of submission which is Project Assessment.

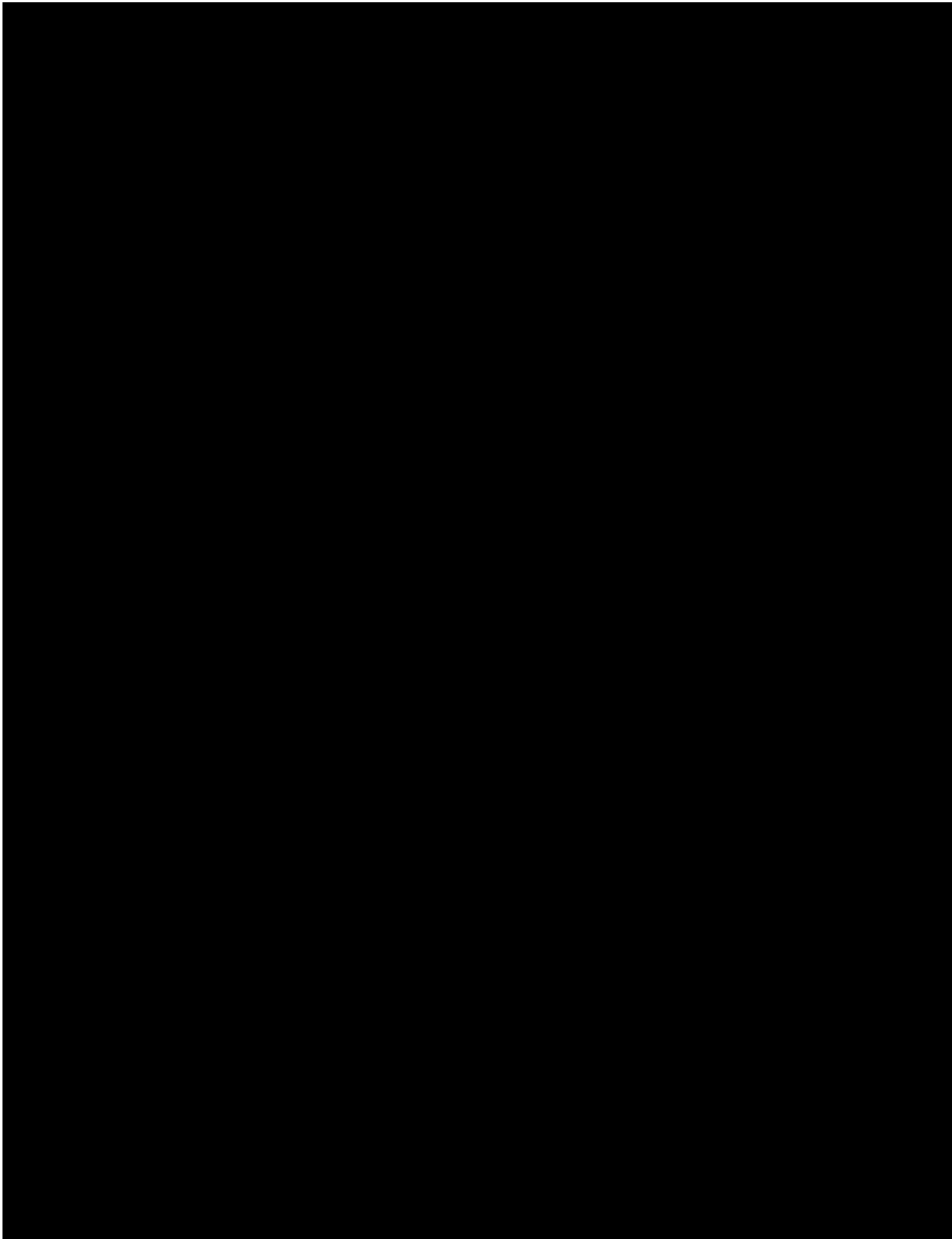
Connection Assets

Due to the new build with numerous connections, it is not considered practical to have simultaneous working parties constructing GIS apparatus. This will decrease commissioning outage requirements and avoid any one customer delaying the completion of the GIS board, particularly where they form a mid-bay. The boundary is CUSC 2.12.1 (f) (i). In practice, the cable sealing end gas to cable bushing will form the boundary. This is to avoid connection operators owning a short section of gas insulated busbar. Busbar extension is included as an infrastructure element to capture the busbar element of a modular GIS bay. Given this is procured as one item, it is an attempt to capture some cost split at this early stage rather than procuring additional plant.



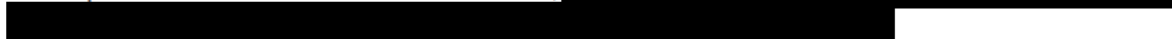






3.2 Asset Health

There are asset health/non-load drivers for interventions at this substation alongside the predominant load-related drivers for investment. These asset health drivers are considered likely to affect the scope and timing of the preferred load-related intervention and have been a critical factor in evaluating suitable design solutions throughout FEED development. Most significantly in relation to this point and the interface with asset health,



Much of the equipment in the Aberthaw 275 kV and 132 kV substations has been in operation since the [REDACTED]

[REDACTED]

[REDACTED]

Due to the planned scope of works covered by this submission, most of the assets that met the non-load intervention criteria were excluded from the non-load plan. [REDACTED]

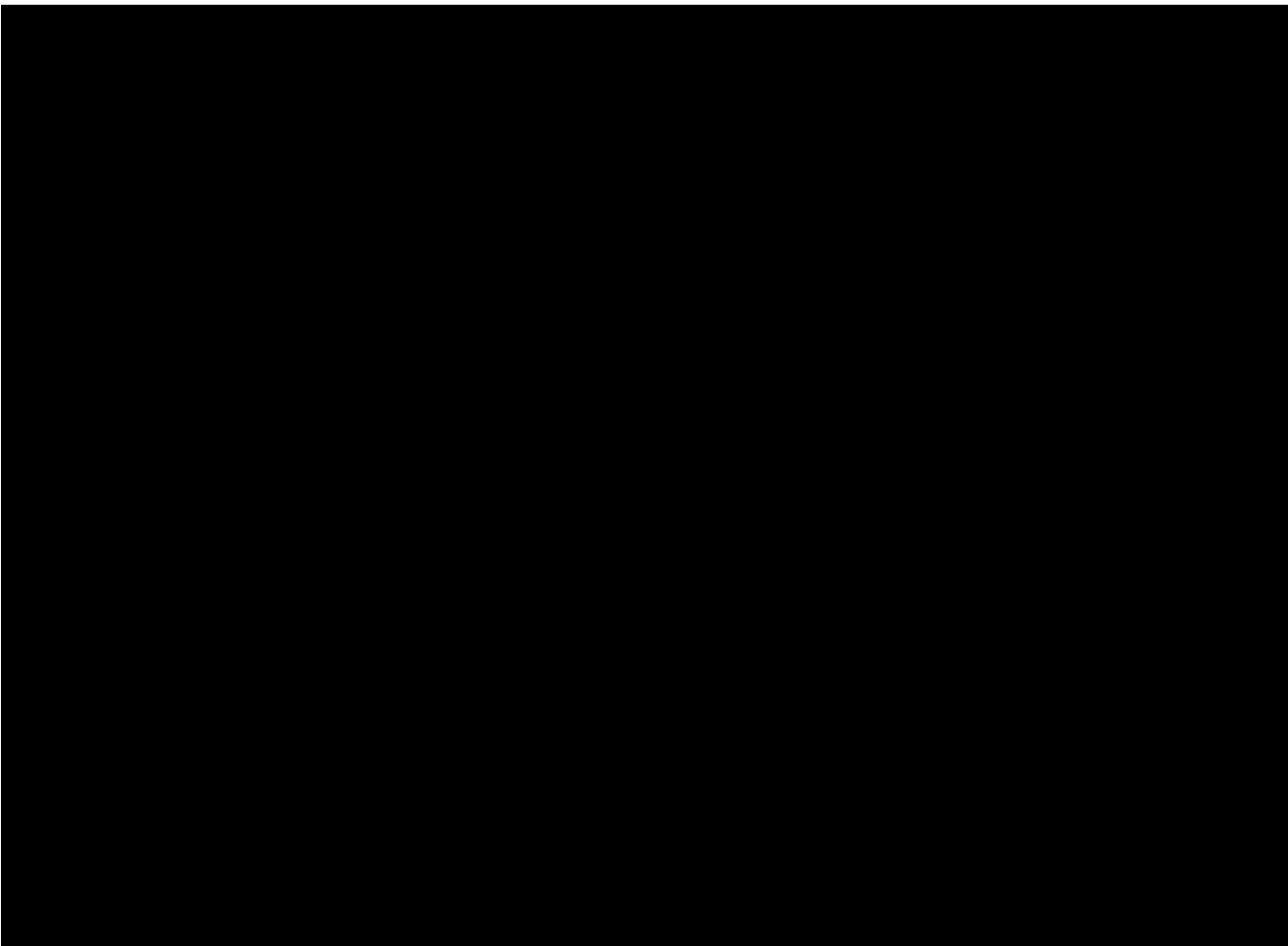
This submission seeks funding only for the load-related scope described herein. Where load-related scope delivered through reopeners replaces previously allowed non-load-related (NLR) asset funding included within the T3 Final Determination, the corresponding NLR outputs will not be delivered and therefore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

A summary of the current asset health position at Aberthaw is provided in Tables 7 and 8. This reflects our most recent assured view of asset condition at the site and is included solely to support the needs assessment for the proposed load-related investment. There are some asset types for which detailed condition data is not yet included within our asset health database at an individual asset level and is therefore not reflected in the summary. These assets include post insulators and primary civils, which represent a significant asset health driver for this scheme of works.

As to be expected given the intervening period driven by general aging and usage deterioration, asset health conditions have evolved since the RIIO-T3 submission, which was based on [REDACTED] asset condition data.

² This was submitted as part of our response to the RIIO-T3 Draft Determination.
National Grid | May 2026 | Aberthaw 275/132 kV Site Strategy





Where there are higher-risk assets at the site, we will continue to assess and manage the risks until the project is delivered. We will provide details and cost information for the asset health interventions to be included in this project at Project Assessment stage.

4. Optioneering

We follow a structured, multi-factor optioneering process to select the most economic and efficient solution, in the interest of consumers. In line with the Electricity Transmission Design Principles, our optioneering process considers 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:

Table 9: 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.

Options A, B, and C were eliminated early in our evaluation process due to licensing and contractual constraints, and these options also do not meet the customer drivers. As detailed below, our initial high-level assessment concluded that the drivers could be effectively met by building a new substation. A descriptive rationale is explained in Section 4.3, table 11.

4.2 Siting

Scope of the siting study

As option E would require a new site, a siting study was conducted to locate the most suitable location for the combined substation. Six candidate sites (capable of both AIS & GIS layouts) were assessed, and **Site 6** was selected as the preferred site, after taking into consideration various consenting and programme risk constraints.

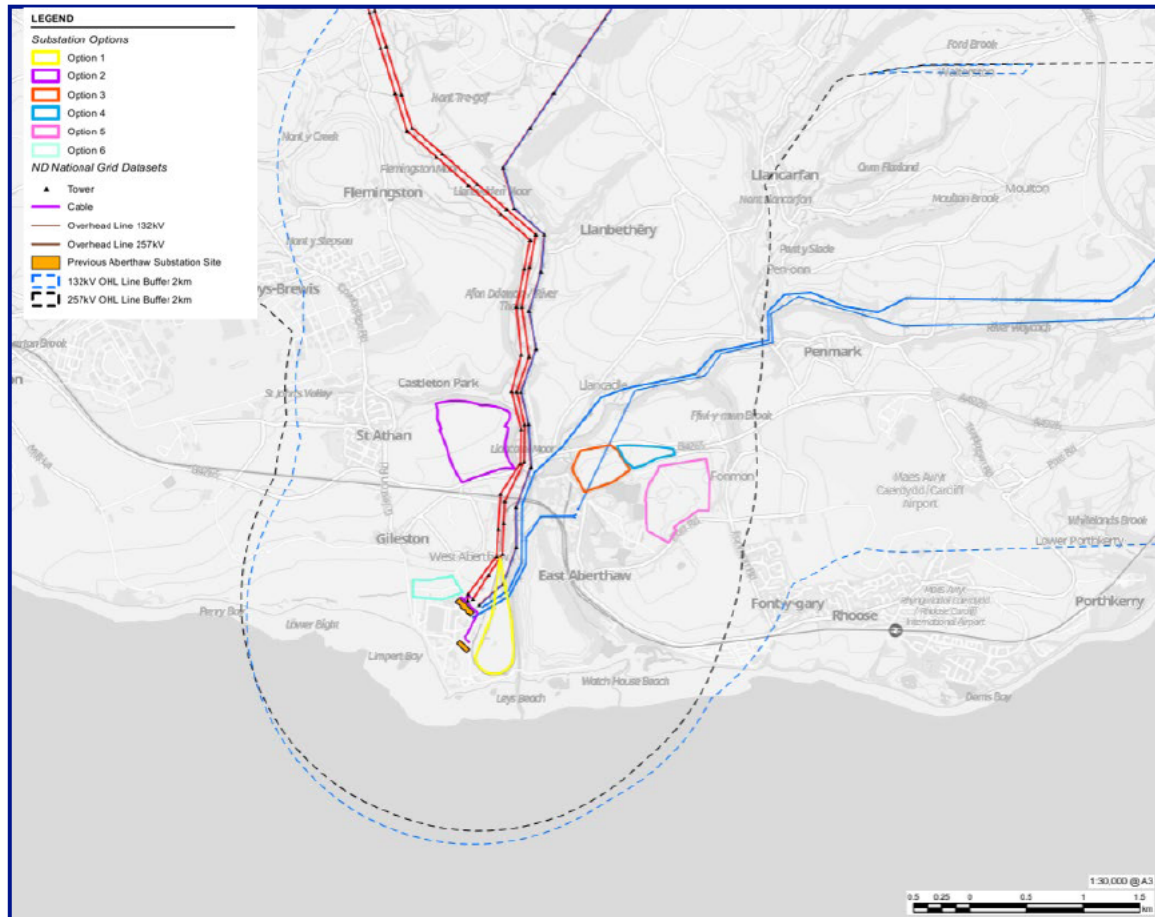
The study shortlisted six sites against environmental, planning, socio-economic and grid-connection criteria. The six options assessed for the Aberthaw Siting Study were:

- **Site 1:** Located in the southern extent of the Study Area, in the boundary of the former Aberthaw Power Station located immediately east of the existing OHL and east of the current 275/132 kV substations.
- **Site 2:** Located in the northwestern extent of the Study Area, located immediately west of the existing OHL, east of St Athan and north of the former Aberthaw Power Station.
- **Site 3:** Located in the eastern extent of the Study Area, located east of the existing OHL, immediately south of the B4265 and north of the mineral sites.
- **Site 4:** Located in the eastern extent of the Study Area, located adjacent to Option 3. Option 4 is south of the B4265 and east and north of the mineral sites at Aberthaw.

- **Site 5:** Located in the southern extent of the Study area, located ~500 m east of the existing OHL.
- **Site 6:** Located in the southern extent of the Study Area, in the confines of the car park of former Aberthaw Power Station located immediately west of the existing OHL and northeast of the previous 275/132 kV substations.

Figure 8 below shows the boundaries of the six shortlisted sites.

Figure 8 – High-level Options for Aberthaw Siting Study³



As part of our Environmental study, “RAG” (Red, Amber, Green) analysis was conducted for these Site Options, with a summary of the results shown in Table 10 below.

³ Full size images of the site options are included in Appendix C
National Grid | May 2026 | Aberthaw 275/132 kV Site Strategy

Table 10: Qualitative analysis table of remaining site options

Site Option	1	2	3	4	5	6
Environment						
Biodiversity	Green	Red	Yellow	Yellow	Green	Green
Landscape and Visual	Green	Red	Yellow	Yellow	Red	Green
Historic Environment	Yellow	Red	Green	Yellow	Yellow	Yellow
Geodiversity and Agricultural Land	Green	Yellow	Yellow	Yellow	Yellow	Green
Water Environment	Yellow	Green	Green	Green	Green	Yellow
Noise	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Socio Economic						
Socio-economic	Green	Green	Green	Green	Green	Green
Technical (Safety)						
Technical (Safety)	Green	Green	Green	Green	Green	Green
Technical (OHL)						
Technical (OHL)	Yellow	Yellow	Yellow	Yellow	Yellow	Green
Technical (Constructability)						
Technical (Constructability)	Yellow	Green	Green	Yellow	Red	Yellow
Cost						
Cost	Yellow	Green	Yellow	Yellow	Red	Green
Consenting, Lands and Programme						
Consenting, Lands and Programme	Yellow	Red	Red	Red	Red	Yellow

Outcome of the siting study

Site 6 was chosen for its balance of advantages: it's on brownfield land next to existing substations, allows connection without major OHL diversion, and minimizes impact and risk. Its location reduces build costs, network disruption, ecological and heritage effects, and flood or contamination risks compared to other sites. It also supports future GIS expansion, though there remains some acquisition risk due to an RWE-held option.

An alternative site which could host the footprint of an AIS solution⁴ is site 1, this would however introduce substantial extra impacts, including OHL diversions likely to require DCO processes, significantly greater engineered solutions (e.g. flood defences), greater ecological and heritage effects, and materially increased planning and programme risk.

In this context, GIS at Site 6 is the only option identified that can meet the network requirement in a proportionate, deliverable and future-proof manner without creating materially greater consenting, environmental and programme risks.



⁴ The review identified an AIS solution would require a footprint up to ~25 ha with operational allowances.



4.3 Long list of Options considered



Table 11 – Longlist table

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
A: Do nothing Rejected	The network is kept in its current state, and no new connections are facilitated.	N/A	N/A	<ul style="list-style-type: none"> Contractual and Licence compliance: Compliant customer connection not delivered, and it would be against our contractual and licence obligations.
B: Market-based solution Rejected	Increased customer demand is accommodated through the procurement and use of ancillary services only.	N/A	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Contractual and Licence compliance: Compliant customer connection not delivered, and the option does not comply with our licence obligations to provide connections.
C: Whole systems solution Rejected	The required customer connection is accommodated by a DNO.	N/A	<ul style="list-style-type: none"> The volume of connections in the region would require extension regardless of site, carrying similar constraints as Option E. 	<ul style="list-style-type: none"> Contractual and Licence compliance: Compliant customer connection not delivered, and the option does not comply with our licence obligations to provide connections Deliverability: Aberthaw requires intervention regardless of connection outcomes, and with customers located nearby there is no viable DNO capacity alternative, while any 132 kV demand transfer would be disadvantaged by non-aligned queues with the DNO prioritising its queue despite an earlier transmission application date.
Option D-1 Taken Forward	Utilise existing AIS substation with a “do minimum” approach.	[REDACTED]	[REDACTED]	<ul style="list-style-type: none"> Cost: This option was taken forward on the basis that it would require the least intervention and likely be the lowest cost solution.

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
	[REDACTED]	[REDACTED]	<ul style="list-style-type: none"> Minor land acquisition and a new easement are needed, with no significant environmental constraints identified beyond potential contaminated land and any associated remediation. 	<ul style="list-style-type: none"> Engineering: Doesn't fix core asset/operability limits and leaves no 132 kV headroom or spare bays. Deliverability: Requires exceptional, multi-year outages and bespoke procurement, with timescales comparable to rebuild.
Option D-2 Rejected	<p>Utilise existing AIS substation, whilst providing a non-SF6 GIS or AIS extension for additional bays.</p> <p>Requires uprating [REDACTED]</p>	<p>Layout: [REDACTED]</p> <p>SLD: [REDACTED]</p>	<ul style="list-style-type: none"> Planning permission and SAB (SuDS) consent are required, alongside new easement rights over the existing lease. This option has the largest land footprint, with no significant environmental constraints identified beyond potential contaminated land and any associated remediation from historical land use. 	<ul style="list-style-type: none"> Engineering: Some decoupling/futureproofing is possible, but legacy asset-health and end-of-life dependencies remain. Deliverability: Avoids bespoke plant and eases build via offline works, but a new site adds major programme complexity. Economic / Consumer Value: Discounted because this option loses key benefits post-connections reform and carries a new-site cost premium. Consenting / Stakeholder: Requires new land and consents, with no existing NGET land available.
Option E-1 Rejected	New substation build, AIS, cabled to existing OHL towers (assuming local site)	[REDACTED]	<ul style="list-style-type: none"> Planning permission and SAB (SuDS) consent are required. The option needs new land and new cable easement corridors; the power station site has minimal environmental 	<ul style="list-style-type: none"> Engineering: Coastal pollution class IV and site constraints make GIS the viable, future-capable solution over AIS Environmental: AIS increases land take/hedgerow impacts; GIS avoids escalation Deliverability: AIS is flood/access/OHL-complex and delay-prone; GIS is simpler and lower risk.

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
			<p>constraints beyond potential contaminated land/remediation, while other (likely greenfield) locations would have greater environmental impact.</p>	<ul style="list-style-type: none"> • Economic / Consumer Value: GIS is lower-risk and more cost-effective than AIS. • Consenting / Stakeholder: AIS triggers public right of way, residential and ancient monument consenting risk; GIS avoids
<p>Option E-2 Taken forward</p>	<p>New substation build, non-SF6 GIS, cabled to existing OHL towers (assuming local site)</p>		<ul style="list-style-type: none"> • Planning permission and SAB (SuDS) consent are required. • Requires new land and new cable easement corridors; the power station site has minimal environmental constraints beyond potential contaminated land/remediation, while other (likely greenfield) locations would have greater environmental impact. 	<ul style="list-style-type: none"> • Engineering: New build fixes legacy issues (including fault level) and enables futureproofing, but cables need proximity and add reactive power issues. • Deliverability: Enables connections, but a new build drives programme risk and cable viability depends on being close to the existing site/OHL. • Economic / Consumer Value: Cost is the main drawback especially for cables (high £/km) and added maintenance versus OHL diversion.
<p>Option E-3 Rejected</p>	<p>New substation, AIS, OHL realignment to the rebuilt substation</p>		<ul style="list-style-type: none"> • Planning permission and SAB (SuDS) consent are required, and >2 km of OHL works would trigger a DCO, adding ~2–3 years to the programme. • Requires new land and new cable easement corridors; the power station site has minimal environmental constraints beyond potential contaminated land/remediation, while other 	<ul style="list-style-type: none"> • Engineering: Coastal pollution class IV and site constraints make GIS the viable, future-capable solution over AIS • Environmental: AIS increases land take/hedgerow impacts; GIS avoids escalation • Deliverability: AIS is flood/access/OHL-complex and delay-prone; GIS is simpler and lower risk. • Economic / Consumer Value: GIS is lower-risk and more cost-effective than AIS. • Consenting / Stakeholder: AIS triggers public right of way, residential and ancient monument consenting risk; GIS avoids

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
			(likely greenfield) locations would have greater environmental impact.	
Option E-4 Taken forward	New substation, non-SF6 GIS, OHL realignment to the rebuilt substation		<ul style="list-style-type: none"> • Planning permission and SAB (SuDS) consent are required, and >2 km of OHL works would trigger a DCO, adding ~2–3 years to the programme. • Requires new land and new cable easement corridors; the power station site has minimal environmental constraints beyond potential contaminated land/remediation, while other (likely greenfield) locations would have greater environmental impact. 	<ul style="list-style-type: none"> • Economic/Consumer value: As Option E2, noting an OHL option provides cost-effective flexibility for locating further from OHL network and is preferred for future maintenance accessibility.
Option E-5 Rejected	New non-SF6 GIS substation – minimal land take. Phased build to allow for the demolition of old 275 kV and rebuild 132 kV in place		<ul style="list-style-type: none"> • Planning permission and SAB (SuDS) consent are required. • Requires new land and new cable easement corridors; development on the existing power station site has minimal environmental constraints beyond potential contaminated land and 	<ul style="list-style-type: none"> • This option is based on the same principal as E1-4. The option however seeks to utilise existing NGET land at the expense of programme. • Engineering: AIS won't fit, so the option is constrained to GIS. • Deliverability: Reuse avoids new land but decommission/demolition doubles programme and adds complexity.

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
			<p>associated remediation from historical land use.</p>	<ul style="list-style-type: none"> • Economic / Consumer Value: Despite favourable legacy terms and reduced land need, extra time/complexity/cost outweighs smaller land take, so this option is rejected. • Consenting / Stakeholder: Less new land acquisition is required. • Environmental: Smaller land take is a benefit, but not enough to justify the option.
<p>Option E-6 Rejected</p>	<p>New non-SF6 GIS substation – minimum land take. Phased build to allow for demolition of old 132 kV first</p>		<ul style="list-style-type: none"> • Planning permission and SAB (SuDS) consent are required, and >2 km of OHL works would trigger a DCO, adding ~2–3 years to the programme. • Requires new land and new cable easement corridors; the power station site has minimal environmental constraints beyond potential contaminated land/remediation, while other (likely greenfield) locations would have greater environmental impact. 	<ul style="list-style-type: none"> • As Option E5 but switching development with some additional land take due to the need to relocate SGTs first. • This option was rejected for the same reasons as E5.
<p>Option E-7 Rejected</p>	<p>New non-SF6 GIS substation, transmission voltage built at 400 kV, interbus transformers provided locally.</p>		<ul style="list-style-type: none"> • Planning permission and SAB (SuDS) consent are required. S37 or NSIP consent required for 400 kV uprated lines. As no current driver can be demonstrated, this would not be achievable. 	<ul style="list-style-type: none"> • Engineering: Complex interface to existing substation, ability to “extend” not possible increasing outage requirements. Siting interbuses any distance requires additional 400 kV towers or design assessment of L2 towers, potential use of retro-insulated cross-arms if innovation projects successful.

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
			<ul style="list-style-type: none"> The option needs new land and new cable/OHL easement corridors; the power station site has minimal environmental constraints beyond potential contaminated land/remediation, while siting interbuses locally will likely require greenfield land which would have greater environmental impact. 	<ul style="list-style-type: none"> Deliverability: Consenting requirements (e.g. NSIP), development delay to switch to 400 kV solution and procurement of five interbuses. Consenting / Stakeholder: Greater land acquisition is required. Interbuses locally would conflict with Lightsource land option, [REDACTED] increased consenting risk, e.g. cumulative EIA. Environmental: Greenfield land likely required. Additional transmission losses, oil requirements and capital carbon.
<p>Option E-8</p> <p>Rejected</p>	<p>New non-SF6 GIS substation, transmission voltage built at 275 kV, interbuses provided locally or remotely, as required.</p>	<p>[REDACTED]</p>	<ul style="list-style-type: none"> Planning permission and SAB (SuDS) consent are required. S37 or NSIP consent required for 400 kV uprated lines. As no current driver can be demonstrated, this would not be achievable. Consent likely to be future risk, as interbuses would not be provided today. The option needs new land and new cable/OHL easement 	<ul style="list-style-type: none"> Engineering: Complex interface to existing substation, ability to “extend” not possible increasing outage requirements. Siting interbuses any distance requires additional 400 kV towers or design assessment of L2 towers, potential use of retro-insulated cross-arms if innovation projects successful. Deliverability: Consenting requirements (e.g. NSIP), development delay to switch to 400 kV solution and procurement of up to five interbuses.

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Constraints	Rationale for rejecting or taking forward the option
			<p>corridors; the power station site has minimal environmental constraints beyond potential contaminated land/remediation, while siting interbuses locally could require greenfield land which would have greater environmental impact. It may be possible to site on the former 275 kV, but this would likely require additional circuit alteration. The remote end would be dependant upon the site.</p>	<div data-bbox="1397 411 2085 512" style="background-color: black; width: 100%; height: 63px;"></div> <div data-bbox="1397 520 2085 743" style="background-color: black; width: 100%; height: 140px;"></div> <ul style="list-style-type: none"> <li data-bbox="1364 759 2121 815">• Environmental: Greenfield land may be required. Additional transmission losses, oil requirements and capital carbon.

Longlist evaluation

Based on the rationale explained in Section 4.3, we have discounted Options A, B and C because they will not allow us to facilitate the connection requests and consequently, we will not meet our contractual and licence obligations. Options E-7 and E-8 were discounted as there is no network requirement to provide a 400 kV connection, considering the additional cost or programme risk associated with these options. Option E-8 could be delivered in the future via remote interbus(es).

The South Wales Regional Strategy appended to this submission provides further detail, which confirms

[REDACTED]

Option D-2 was discounted as it would not meet the asset health driver for this project. Options E-1 and E-3 were discounted as an AIS solution is not suitable for a site in close proximity to the coast (~0.5km) and would feature various consenting and program risk. Options E-5 and E-6 were also discounted at this stage due to the additional complexity, cost and program risk involved. Options D-1, E-2 and E-4 were progressed to the shortlist for their ability to meet the projects drivers.

[REDACTED]

[REDACTED]

[REDACTED]

4.3.1 Influence of stakeholders on shortlisting

[REDACTED]

DNO and Third-Party Works

A [REDACTED] Third Party Works (TPW) scheme was triggered by the first 132 kV demand customer, Bro Tathan, to split NGED's Cardiff demand group. If the Aberthaw 132 kV GSP itself was split;

NGET's confidence in the TPW cost estimate was low: the quote assumed additional feeder bays at GSPs with available capacity yet also stated there was no land or capacity to extend to accommodate the required circuits potentially necessitating new GSP/BSPs and TPWs would delay the preferred option. NGET challenged NGED's technical case, receiving a formal justification report; NGED also noted the TPW would reduce their network resilience. NGET therefore considered splitting the 132 kV GSP, [REDACTED]

[REDACTED] three TPW options were evaluated:

- **DNO1:** Do Nothing - Customer triggering Third Party Works pays [REDACTED] to the DNO for their network split
- **DNO2:** Network split at 132 kV level – i.e. there would be two Aberthaw 132 kV substations. One, NGET owned and operated as an infrastructure site. The Second, NGED owned and operated, fed by connection asset SGTs.
- **DNO3:** As DNO2, however the substation would not be immediately split. Provides an insurance policy should NGET or NGED connection queues significantly alter removing the need to works.

DNO2 was selected as the preferred option because it represents best whole-system value, provides a stronger ACL and cost certainty.

[REDACTED] underlines the importance of the Aberthaw/Cardiff East network split to provide system reinforcement required to keep fault levels within switchgear ratings, prevent thermal overloads under intact and outage conditions, and to maintain statutory & industry security standards. As this provides shared network reinforcement required to keep the system safe, secure and compliant for many users, this justifies the socialisation of cost to consumers.

NGED are currently undertaking optioneering on their replacement 132 kV substation and are understood to be drafting their RIIO-ED3 Engineering Justification Paper for submission later this year. As a result, scope and cost of the NGED development are out of scope for this paper.

For the preferred option, NGET have sought to provide provision for the replacement NGED GIS substation within the acquisition and development footprint. This is to ensure that a viable point of connection remains available to NGED whilst they explore their full optioneering process, considering technology type and land available. As a result, the scheme costs do include land acquisition, basic construction platform and drainage provision for the development for NGED. Should NGED not utilise this land, NGET anticipate its retention after use for construction as future maintenance laydown and are consenting as a storage/laydown area.

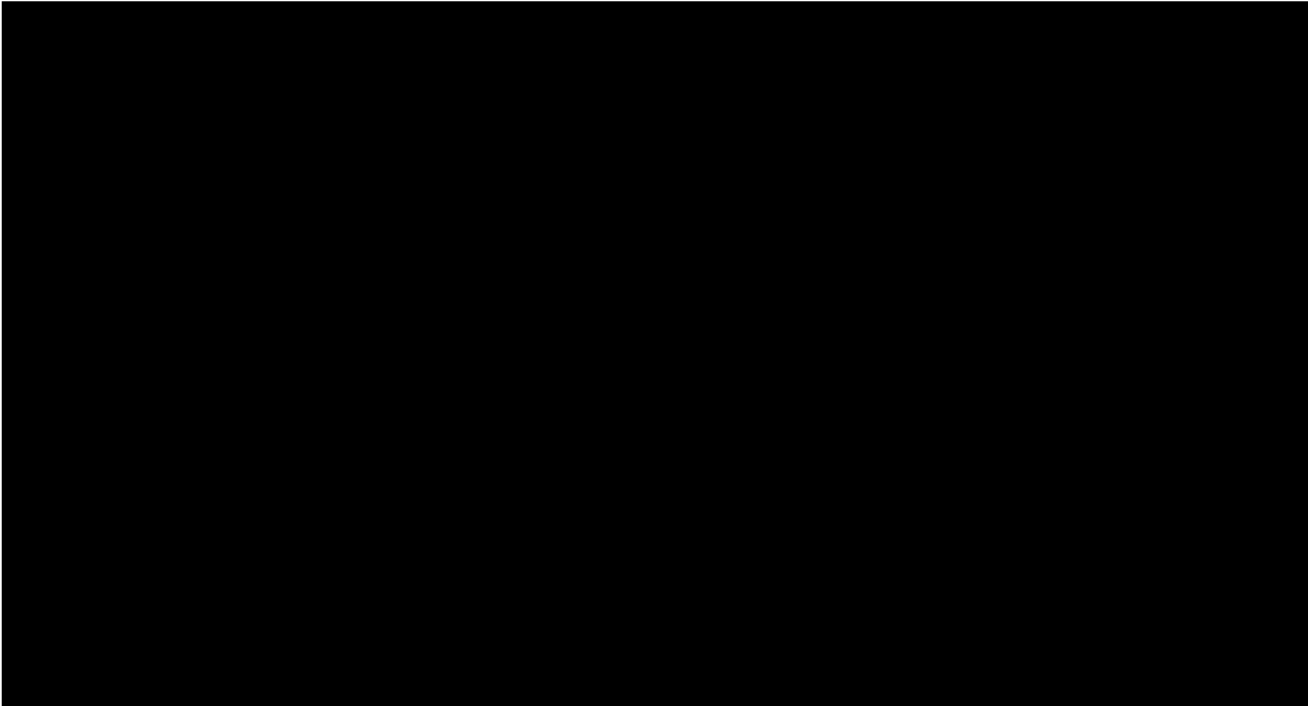
4.4 Shortlisted Options

The shortlisted options for Aberthaw 275/132 kV are:

- Option D-1: Do minimum works, utilising spare bays at existing AIS substation
- Option E-2: New substation build, non-SF6 GIS, cabled to existing OHL towers (assuming local site)
- Option E-4: New substation, non-SF6 GIS, OHL realignment to the rebuilt substation
- Option E-6: Prioritisation of 132 kV non-SF6 GIS rebuild, with a delayed 275 kV build

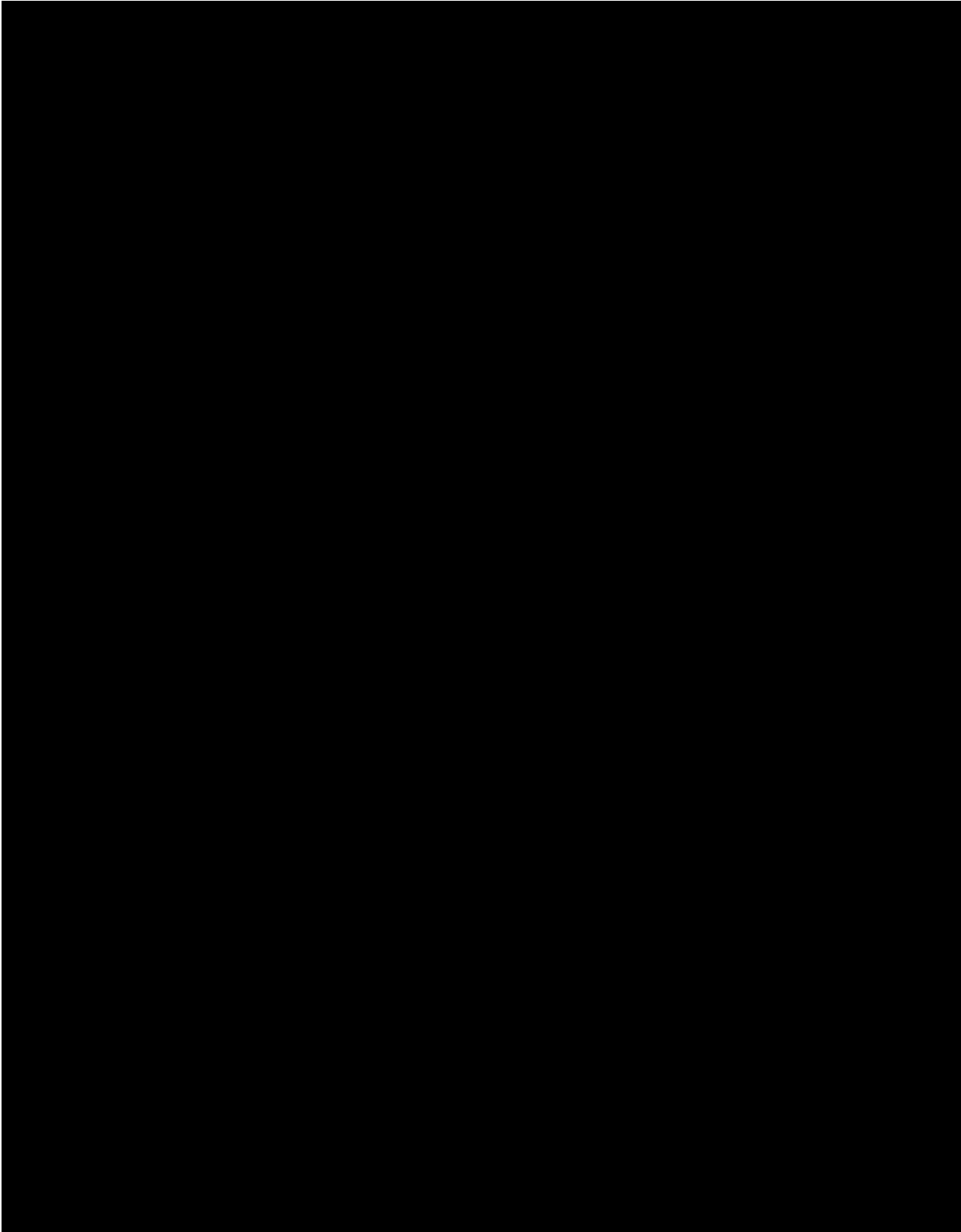
4.4.1 Option D-1 Do minimum works, utilising spare bays at existing AIS substation





4.4.2 Option E-2: New substation build, GIS, cabled to existing OHL towers (assuming local site)





4.4.3 Option E-4 New substation, GIS, OHL realignment to the rebuilt substation

[Redacted]

[Redacted]

[Redacted]

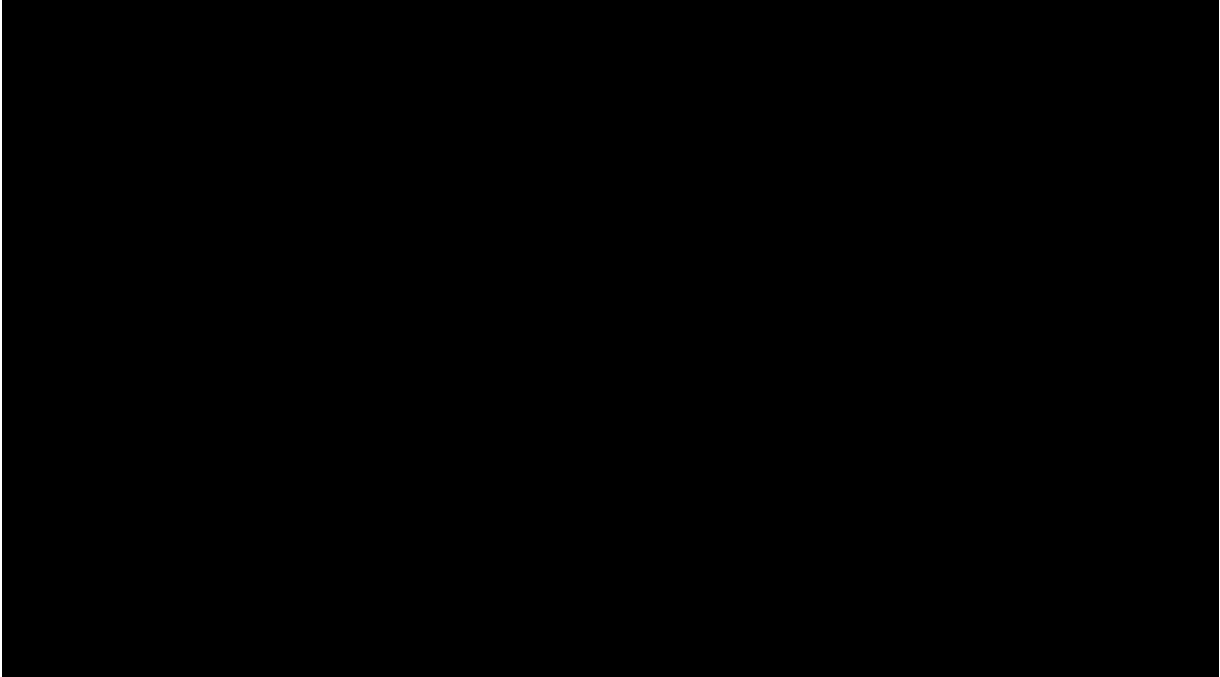
4.4.4 Option E-6: Prioritisation of 132 kV GIS rebuild, with a delayed 275 kV build.

[Redacted]

[Redacted]

[Redacted]

[Redacted]



The System Design Table included in appendix B demonstrates how the system design of the above shortlisted options has been considered in meeting the investment drivers of the project.

4.5 Detailed qualitative analysis of shortlisted options

Table 12, below, provides a summary of our detailed qualitative assessment of the optioneering categories; engineering, environmental, deliverability, economic & consumer value and consenting & stakeholder impact, for the four shortlisted options.

Table 12: Detailed Qualitative Assessment Table for shortlisted options

Optioneering Categories					
Option	Engineering	Environmental	Deliverability	Economic/Consumer Value	Consenting /Stakeholder
Option D-1: Do minimum works, utilising spare bays at existing AIS substation	<ul style="list-style-type: none"> Delivered on the existing Aberthaw sites using remaining spare bays, with no OHL works, but it does not provide future-proofing. Accommodating 360 MVA SGTs within the legacy footprint is challenging; SGT4 would require off-site works, and some site expansion or cable diversions may be needed. Refurbishment would be complex on a live site and may still not achieve a further 40-year life; bespoke plant, safety clearance issues, fault-level constraints and maintenance limitations remain. 	<ul style="list-style-type: none"> Re-use of the existing civil infrastructure and AIS plant gives the lowest upfront construction carbon. Development on the existing site avoids direct ecology and ecosystem impacts. Limited future-proofing could constrain future low-carbon connections in the area 	<ul style="list-style-type: none"> Limited offline build opportunities mean an extremely high live-site outage and resource burden. SGT uprating and 132 kV post-insulator replacement would require multiple outage seasons, delaying delivery of full capacity. Bespoke 275 kV breaker procurement and major roof/cladding works add further programme risk. 	<ul style="list-style-type: none"> Lowest upfront capex, but there is a material risk of early write-off and higher future opex if the legacy site cannot reasonably be extended to the required life. Significant outages and deferred maintenance across the Cardiff demand group could create additional, unquantified DNO costs. The indoor AIS arrangement would continue to impose a relatively high maintenance and outage burden 	<ul style="list-style-type: none"> Still requires new land and consents for SGT4, with possible site boundary expansion. Stakeholder views are mixed: the landowner has concerns about retaining the current arrangement, while the DNO prefers to keep its healthy assets in situ. DNO outage constraints would be significant during post-insulator replacement works.
	Strong Detractor	Detractor (no future connections)	Strong Detractor	Neutral	Benefit
Option E-2: New substation build, GIS, cabled to	<ul style="list-style-type: none"> A new GIS build can be designed to modern standards and offers greater routing flexibility through cables. 	<ul style="list-style-type: none"> Compared with an OHL solution, the cabled option is likely to have higher carbon and ecosystem impacts 	<ul style="list-style-type: none"> Requires new land and consents, extending the development programme, although cables may benefit from PD rights. 	<ul style="list-style-type: none"> Higher cost than D-1 and higher than E-4, with cable length being a key cost driver. Whole-life opex is higher for cables, and some site 	<ul style="list-style-type: none"> Likely to face a lighter consenting regime than an OHL realignment and may be more acceptable locally.

Optioneering Categories					
Option	Engineering	Environmental	Deliverability	Economic/Consumer Value	Consenting /Stakeholder
existing OHL towers (assuming local site)	<ul style="list-style-type: none"> The cabled solution introduces more interface complexity, including cable crossings, longer cable design considerations, and potentially an interconnector to support transfers from the legacy site. Final site conditions may still require mitigation for issues such as contamination, piling, historic buried infrastructure, flood defence and maintenance access. 	<ul style="list-style-type: none"> because of greater civil works and footprint. It may offer longer-term visual benefits. Environmental effects remain site-dependent, and any contaminated ground would require careful design treatment. 	<ul style="list-style-type: none"> Removes many dependencies on the existing site, but dual operation would still be needed until DNO transfers are complete. GIS lead times and cable-route complexity could add programme risk, albeit with lower outage/resource requirements than D-1. 	<ul style="list-style-type: none"> variants could also create ongoing sea-defence liabilities. It does, however, provide future-proofing for spare bays and future capacity growth. 	<ul style="list-style-type: none"> Planning and new land are still required, and a large land take remains difficult, particularly for AIS variants. DNO preferences and the user connection boundary remain important design considerations.
	Benefit	Detractor	Neutral	Detractor	Neutral
Option E-4: New substation, GIS, OHL realignment to the rebuilt substation	<ul style="list-style-type: none"> A new GIS/OHL build can be designed to modern standards and has less interaction with customer and DNO buried cables. Relative to a cabled option, OHL is generally simpler to build and operate and is easier to future-proof for later 275 kV reinforcement. Some complexity remains around legacy site interfacing and site-specific ground/access conditions, but overall, the design is more 	<ul style="list-style-type: none"> Lower carbon footprint than the cabled alternative, with scope to adjust tower placement sensitively. Brownfield options are available, although local impacts will still depend on the final siting. Vegetation management may be required if woodland is oversailed. 	<ul style="list-style-type: none"> Requires new land and consents, and OHL consents add programme risk. Dual operation would still be required, but it avoids the cable-route complexity of E-2 and has lower outage/resource requirements than D-1. GIS lead times still need to be managed, although the initial civils programme should be faster. 	<ul style="list-style-type: none"> Higher cost than D-1, but lower than E-2, with no cable-driven whole-life opex burden. Whole-life maintenance costs are lower for OHL than for cables; some AIS variants could still introduce sea-defence liabilities. Option E-4 is designed to accommodate future growth by providing spare and populated GIS bays at 132 kV and 275 kV, reserving space for two additional 360 MVA SGTs, enabling flexible future 	<ul style="list-style-type: none"> OHL realignment requires additional S37 consents and could create DCO/NSIP risk, although this is mitigated by the local routing. Visual change is relatively limited where the OHL is realigned to the preferred site. Planning and land requirements still apply, but the stakeholder issues appear more manageable than for the staged or fully cabled alternatives.

Optioneering Categories					
Option	Engineering	Environmental	Deliverability	Economic/Consumer Value	Consenting /Stakeholder
	straightforward than the staged or heavily cabled alternatives			switching arrangements, and incorporating preparatory ducting, civil works and uprating-ready OHL/tower design to minimise future rework, outages and whole-life cost.	
	Benefit	Neutral	Neutral	Neutral	Neutral
Option E-6: Prioritisation of 132 kV GIS rebuild, with a delayed 275 kV build	<ul style="list-style-type: none"> Prioritising the 132 kV build addresses an immediate need, but the staged approach introduces greater engineering complexity, including double circuit transfers and continued interfacing with the existing site. The final OHL/cabling arrangement remains to be defined, and local siting is required because long SGT LV cable runs are not viable. Bespoke 275 kV plant, safety clearance measures and maintenance access considerations would still remain. 	<ul style="list-style-type: none"> This has the highest carbon impact of the rebuild options because it combines a new build with additional interface works to the existing AIS. It is still likely to be on brownfield land, limiting direct ecology impacts. 	<ul style="list-style-type: none"> Prioritising the 132 kV build could reduce near-term asset risk and defer some 275 kV consenting requirements. However, the staged approach extends the overall programme, still requires new land/consents, and remains exposed to GIS and bespoke plant lead times. It offers more flexibility on the timing of the 275 kV build, but at the cost of added staging complexity. 	<ul style="list-style-type: none"> Highest-cost option of the shortlist. It could connect strategic demand earlier, but this comes at the expense of the timing of low-carbon generation connections. The staged approach may preserve some flexibility to revise the later 275 kV build, subject to land availability and wider redevelopment. 	<ul style="list-style-type: none"> Staged delivery could increase consenting risk if it is not progressed as a single package. The longer construction programme is likely to have greater local and community impact. Planning, land take, DNO preference and user connection boundary issues would still need to be managed.
	Strong detractor	Detractor	Benefit	Detractor	Detractor

Based on the qualitative assessment above, our preferred design is Option E-4 because it offers the clearest balance between deliverability, futureproofing and consumer value, while avoiding the drawbacks associated with refurbishing the legacy site, relying on extensive cabling, or adopting a more complex staged delivery strategy.

4.5.1 PASE

The PASE guidance doesn't consider 275 kV infrastructure therefore this investment cannot be assessed for PASE compliance. However, should in future, PASE expand to cover 275 kV infrastructure then this investment would comply as a as a variant option as an Indoor Double Busbar GIS near the coast.

We consider this approach justified, as 275 kV is the most appropriate voltage at this time. NGET's regional studies confirm that targeted reinforcement and futureproofing of the existing 275 kV network will adequately support Aberthaw's contracted connection, asset health and operational requirements, representing the most proportionate and least-regret option for consumers.

4.6 Detailed Quantitative Analysis of Shortlisted Options

4.6.1 Cost Estimates of shortlisted 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, [REDACTED] based on historic project analysis, to account for unforeseen circumstances and to mitigate risks during implementation.

The cost estimates presented in Section 4.6 include the estimated cost of DNO2, ensuring that the total estimated cost of each shortlisted option is assessed on a consistent basis. Section 4.3.1 provides a detailed summary of the Third-Party Works required to deliver the preferred solution at Aberthaw. Appendix D sets out the supporting optioneering analysis, which demonstrates that the estimated cost of DNO2 is efficient, proportionate and represents the best value outcome for consumers.

Table 13 – Cost estimate of works (2023/2024 base prices)

Unit	Option D-1 Cost (£m)	Option E-2 Cost (£m)	Option E-4 Cost (£m)	Option E-6 Cost (£m)
Total	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

4.6.1.1 Cost Drivers

The project's cost estimates are based on current market conditions, with ongoing work to refine requirements. The baseline funding request is supported by high-cost confidence and robust EUL (Estimating Units Lines) assessments.

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

- Cable and OHL lengths across all options
- For GIS layouts, gas insulated busbars compared to cable lengths
- Overall civil input and asset quantities, particularly between do minimum and rebuild options

4.6.2 Cost Benefit Analysis

4.6.2.1 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 includes the following four shortlisted options:

- Option D-1: Do minimum works, utilising spare bays at existing AIS substation
- Option E-2: New substation build, GIS, cabled to existing OHL towers (assuming local site)
- Option E-4: New substation, GIS, OHL realignment to the rebuilt substation
- Option E-6: Prioritisation of 132 kV GIS rebuild, with a delayed 275 kV build

4.6.2.2 CBA Outcome

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

Table 14: Lifetime Cost-Benefit Analysis (2023/2024 base prices, central carbon pricing, discounted values)

Option	Initial Investment (£m)	PV of Lifetime Costs (£m)	PV of Monetised Benefits (£m)	NPV (£m)
Option D-1	████████	████████	████████	████████
Option E-2	████████	████████	████████	████████
Option E-4	████████	████████	████████	████████
Option E-6	████████	████████	████████	████████

On the basis of the discounted lifetime CBA results (Table 14), Option D-1 delivers the highest NPV (████████ 2023/2024 base prices), Option E-4 delivers the next preferable NPV (████████). This analysis is subject to confirmation through deliverability, consents/land, outage and risk considerations, and any CBA sensitivities set out in the assumptions below.

4.6.2.3 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).

4.6.2.4 Costs

Table 15: Summary of all additional Capex and Opex costs (2023/2024 base prices)

Option	Total CAPEX (£m)		Total (£m)
	Initial CAPEX (£m)	Future replacement (40 yr) (£m)	
Option D-1	████████	████████	████████
Option E-2	████████	████████	████████
Option E-4	████████	████████	████████
Option E-6	████████	████████	████████

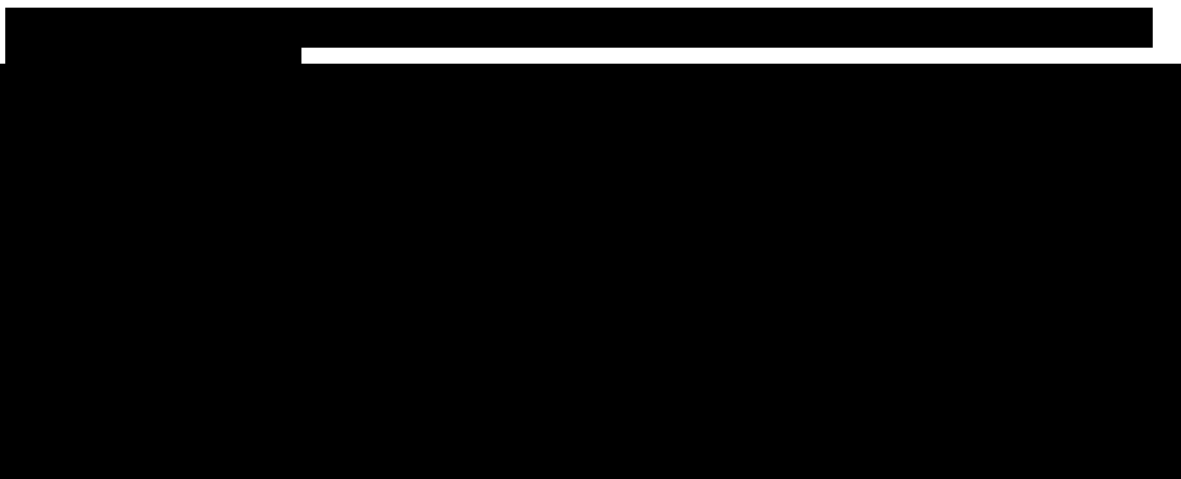
Option D-1 is the lowest capex cost, making it the most cost-effective option. Option E-2 is the most expensive option due to the additional cable length required. The total difference in costs as per Table 15 between Option D-1 and E-2 is approximately [REDACTED]. Options E-2 and E-4 have a small difference in their total cost.

4.6.2.5 Benefits

The following benefits have been included within the CBA:

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

Table 16 presents the summary of all (undiscounted) benefits, including environmental and non-environmental benefits, considering the central base case carbon price.



The lifetime costs and benefits refer to a 40-year period starting from 2027 until 2076. A summary of lifetime CBA results and their apportionment across T3 and T4 is presented in Table 14. Costs and benefits are discounted and presented relative to the Baseline Option counterfactual.

4.7 Preferred Solution

Although Option D-1 has the highest NPV in Table 14, we consider that **Option E-4: New substation, GIS, OHL realignment to the rebuilt substation** is the preferred option for Aberthaw 275/132 kV when the CBA and qualitative assessment are considered together. Option D-1 is not preferred because it would deliver the required capacity by extending reliance on ageing 132 kV and 275 kV AIS infrastructure with known asset health, safety, outage, maintainability and resilience risks. These asset health risks that are prevalent at the existing site are included in section 3.2 of this submission. Achieving a further 40-year life through refurbishment is considered unlikely and would require complex works on, or adjacent to, a live operational substation, including bespoke plant, enabling works and additional safety controls. It would also retain key constraints, including limited fault level headroom, restricted plant access, working at height challenges and structurally embedded through-floor bushings.

By contrast, Option E-4 provides a durable and strategically aligned solution that addresses the immediate customer connection requirement, resolves the underlying asset health challenges, provides for future capacity and avoids further long-life investment in constrained legacy assets.

While E-4 has a lower NPV than D-1, it provides a stronger overall balance of deliverability, resilience, futureproofing and consumer value. On this basis, E-4 is considered the most robust and appropriate long-term solution for Aberthaw.

Table 17 below summarises the qualitative assessment supporting the selection of Option E-4 as the preferred option, notwithstanding that Option D-1 has the highest modelled NPV.

Table 17: Qualitative comparison of Options D-1 and E-4

Option	Cost	NPV	Advantages of this option	Disadvantages of this option
D-1: Use spare bays at existing AIS substations			<ul style="list-style-type: none"> Highest modelled NPV and materially lower upfront cost than E-4. Makes use of existing spare AIS bays Could provide near-term electrical capacity without a full substation rebuild. 	<ul style="list-style-type: none"> Relies on ageing AIS infrastructure with material asset health, safety, outage, maintainability and resilience risks. Requires complex live-site refurbishment, bespoke plant and enabling works, with achieving a further 40-year life considered unlikely. Retains key operational constraints, including limited fault level headroom, working at height issues, restricted access to plant and additional 275 kV safety controls. Provides limited futureproofing and could expose consumers to greater whole-life cost, outage and rework risk.
E-4: New substation, GIS, OHL realignment to the rebuilt substation			<ul style="list-style-type: none"> Addresses the key scope drivers by delivering customer connections, resolving asset health challenges and providing future capacity. Provides a durable, strategically aligned solution that removes reliance on ageing AIS infrastructure 	<ul style="list-style-type: none"> Lower modelled NPV than D-1, meaning it is not the highest-ranked option on CBA alone. Higher upfront cost than using existing spare AIS bays. Requires more substantive construction activity, including a new GIS substation and OHL realignment.

Option	Cost	NPV	Advantages of this option	Disadvantages of this option
			<p>and avoids key legacy-site risks.</p> <ul style="list-style-type: none"> • Uses non-SF6 GIS to minimise land take, reduce environmental impact and improve deliverability compared with AIS options. • Offers the best overall balance of NPV, qualitative performance, resilience, futureproofing and consumer value. 	<ul style="list-style-type: none"> • Requires investment ahead of some longer-term benefits being realised, particularly future capacity and strategic optionality.
Difference:	██████	██████		

4.7.1 Project Benefits & Outputs

The preferred option for this project is **Option E-4: a new GIS 275 / 132 kV substation**.

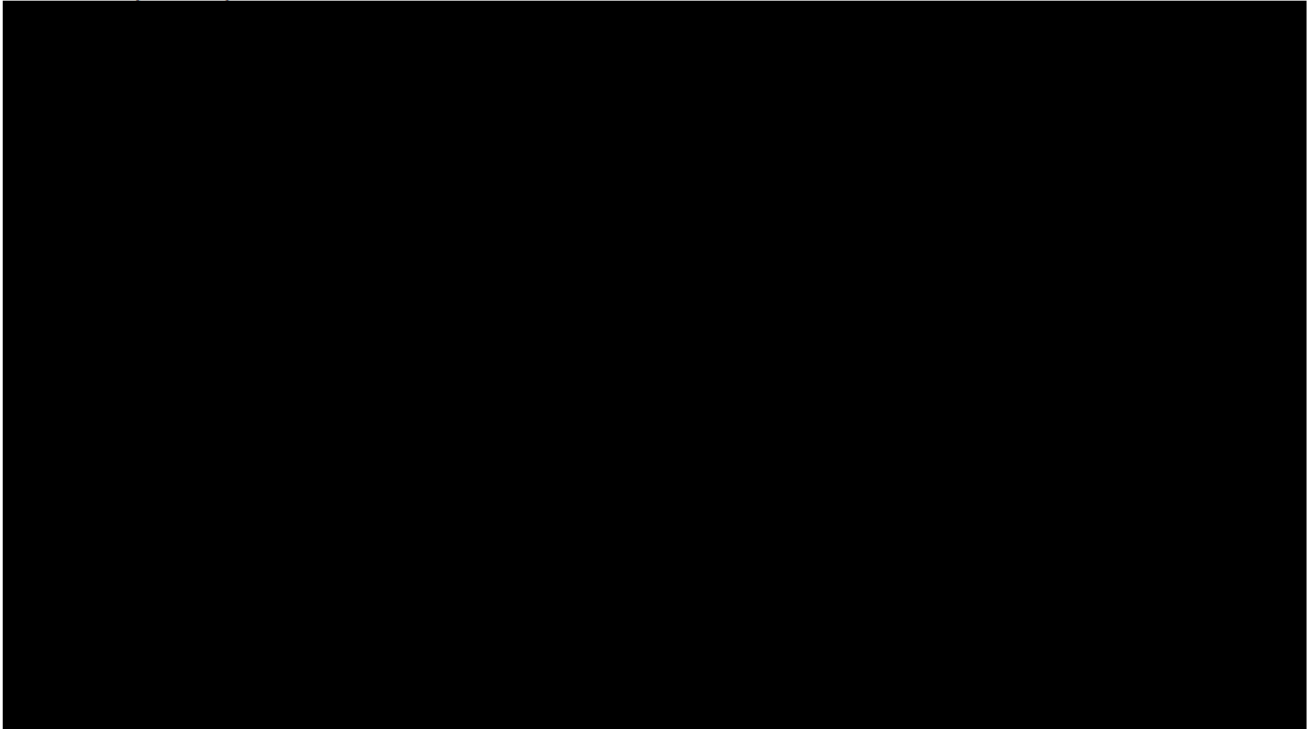
The key outputs and benefits delivered by this option, and how they align to the pillars of our ambition for RIIO-ET3 are as follows:

Table 18: Summary of Outputs and Benefits

Output & Proposed PCD	The delivery of a new GIS 275/132 kV substation, enabling contracted connections and asset health improvements by 2033 (this includes final energisation, completion of circuit transfers and DNO transfer).
	<ul style="list-style-type: none">• Rebuild 1950s–60s substations with a future-ready design to meet forecast capacity and accommodate growth (data centres, transport/heat electrification), with headroom for new generation.• Where OHLs are re-aligned, [REDACTED] to avoid rework ahead of any [REDACTED]• [REDACTED]• [REDACTED]• [REDACTED]• [REDACTED]• Use objective socio-economic assessment in site selection to balance environment, community and consumer impacts on a future-proof site.• Remove installed SF₆ from the network.• [REDACTED]• [REDACTED]

5. Delivery

A programme of works for option E-4: a new GIS 275 / 132 kV substation, is outlined below in figure 17. This illustrates the key milestones for Customer, National Grid, Murphy and Regulation critical pathways.



5.1 Procurement & Contracting Strategies



5.2 Risk & Risk management

Through SWOT analysis we have identified the preferred option does still present some risks; these are also listed in the CBA summary. Refer to the high-level risk assessment and associated mitigation in Table 20 below.

A full qualitative Risk Assessment will be carried out prior to contract award with the EPC Contractor, with the output updated accordingly.

Table 20: Risk Summary Table

Category	Risk	Mitigation Measure
Design & Technical Complexities	<ul style="list-style-type: none"> • Unforeseen ground conditions, buried services or unsuitable site infrastructure • Inaccurate or incomplete site information 	<ul style="list-style-type: none"> • Complete early investigations and utility surveys to de-risk design and construction • Update drawings and technical assumptions using verified survey data
Planning, Land & Consent	<ul style="list-style-type: none"> • Land acquisition dependency and single landowner control • Consenting delay from OHL works, layout changes or DCO risk 	<ul style="list-style-type: none"> • Engage landowner early and prepare shadow CPO if required. • Optimise siting and design to minimise OHL works and consenting complexity.
Thid Party Impact & Network Co-ordination	<ul style="list-style-type: none"> • Needs case or futureproofing challenge during Project Assessment • Missed customer connection dates due to third-party dependencies • Changing customer landscape due to Connections Reform. 	<ul style="list-style-type: none"> • Retain future capacity through reserved bays and space for additional SGTs • Decouple delivery where possible through split GSP and flexible sequencing.

Category	Risk	Mitigation Measure
		<ul style="list-style-type: none"> Secure cost certainty of costs post-connections reform before Project Assessment
Timing of Programme & Resources	<ul style="list-style-type: none"> Outage availability and programme disruption Long-lead items, SAP resource and supply chain constraints 	<ul style="list-style-type: none"> Engage NESO early, secure outages and maintain programme float. Procure critical items early and ringfence key delivery resources.
Cost	<ul style="list-style-type: none"> Cost uncertainty from estimates, contract mechanisms and inflation Exposure to third-party cost increases, including DNO LV supply Cost uncertainty due to timing of existing site demolition. 	<ul style="list-style-type: none"> Refine estimates, apply early contractor input and secure cost certainty early. Align customer securities and project spend to protect consumers. Demolition surveys undertaken during ECI Stage 1 to refine cost estimate. Project Assessment submission timing will depend on the determination of our planning submission, as this will outline additional constraints and certainty of the DNO's programme.

6. Conclusion

This Eligibility Letter following assessment Track 2 EL outlines the investment needs case for a New GIS 275/132 kV substation at Aberthaw. The paper sets out the outputs from the optioneering and CBA process that led to the identification of the preferred solution. The drivers for this investment are the connection of [REDACTED] (In addition to the load drivers there are asset health considerations, with approximately [REDACTED] drivers across both the 132 kV and 275 kV substations.

The proposed solution is **option E-4: a new GIS 275 / 132 kV substation**. Option E-4 is the most economical solution overall and will enable NGET to satisfy all contracted connections, whilst also offering optionality for future extendibility.

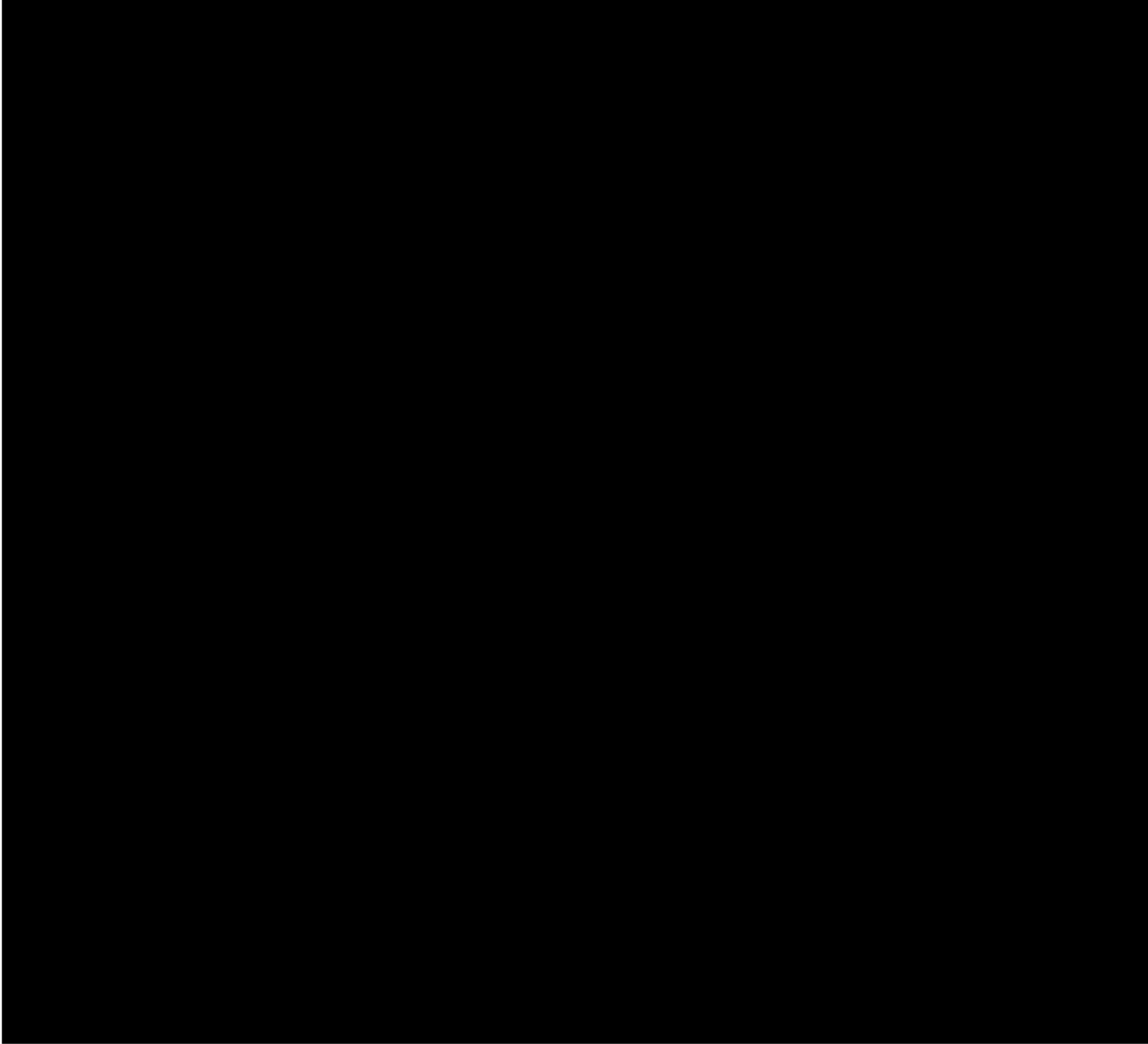
There are known uncertainties and risks associated with Option E-4 that have been captured in this Load Reopener, such as supply chain, land contamination and consenting risks. To ensure our successful delivery of this project, collaboration with all stakeholders involved in the proposed investment and within the Aberthaw site is critical.

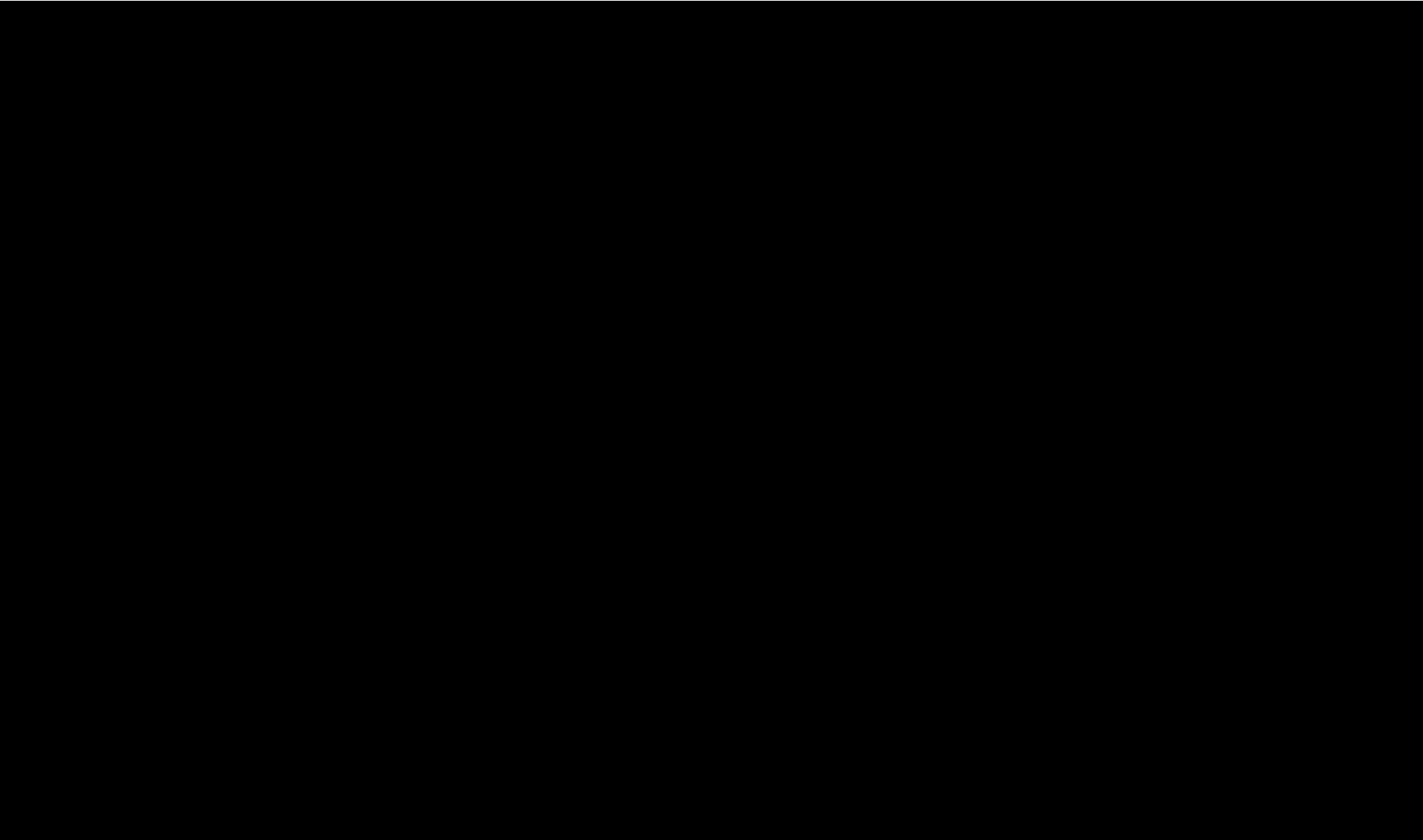
This submission outlines a preferred solution to satisfy the investment drivers. It seeks confirmation of eligibility under Special Condition 3.18, confirmation of eligibility for PCF under Special Condition 3.15, confirmation of re-opener Track 2 EL and formal approval of the preferred option. The Price Control Deliverable (£m) associated with this investment proposal is as follows:

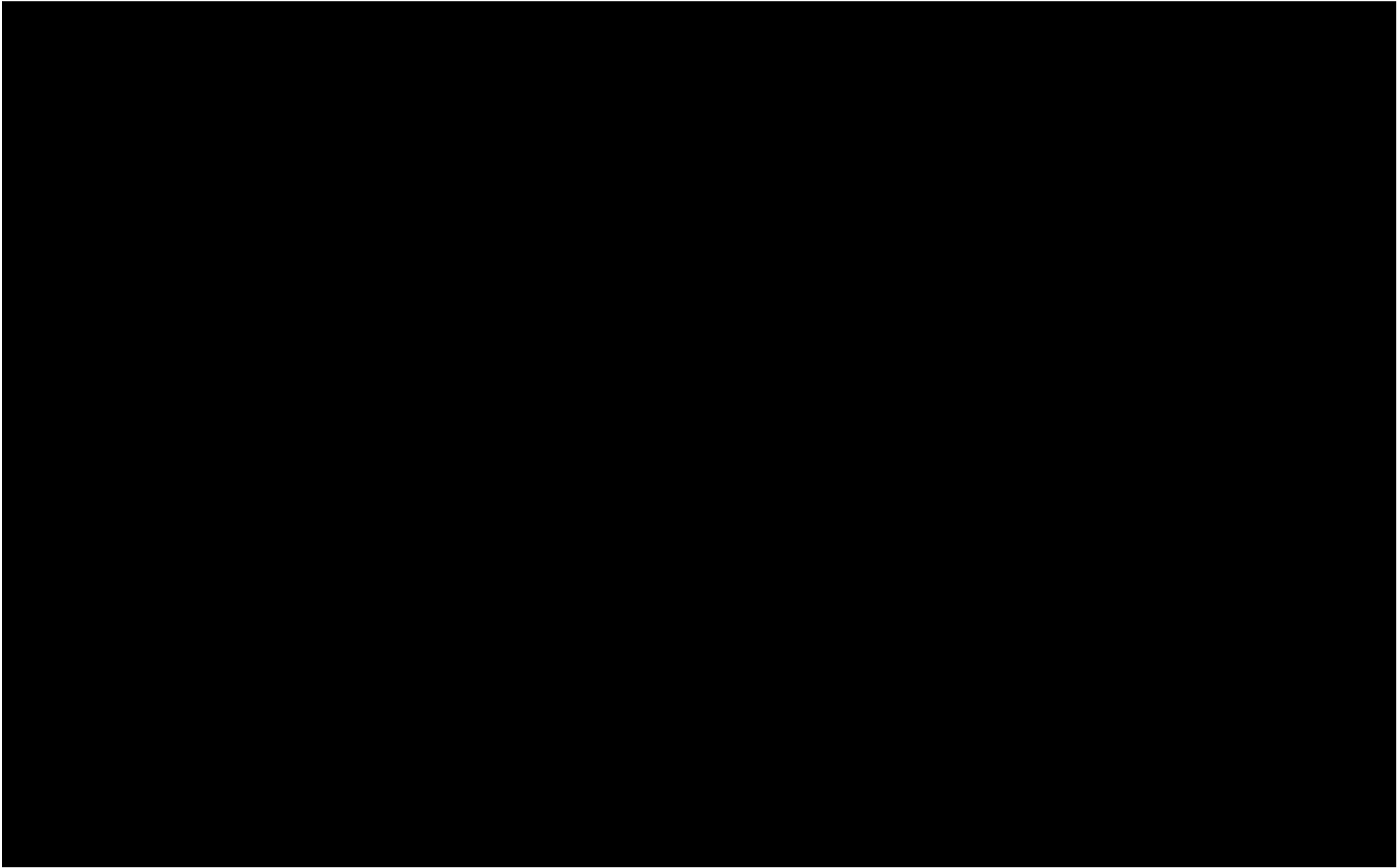
Table 21 – Investment Summary

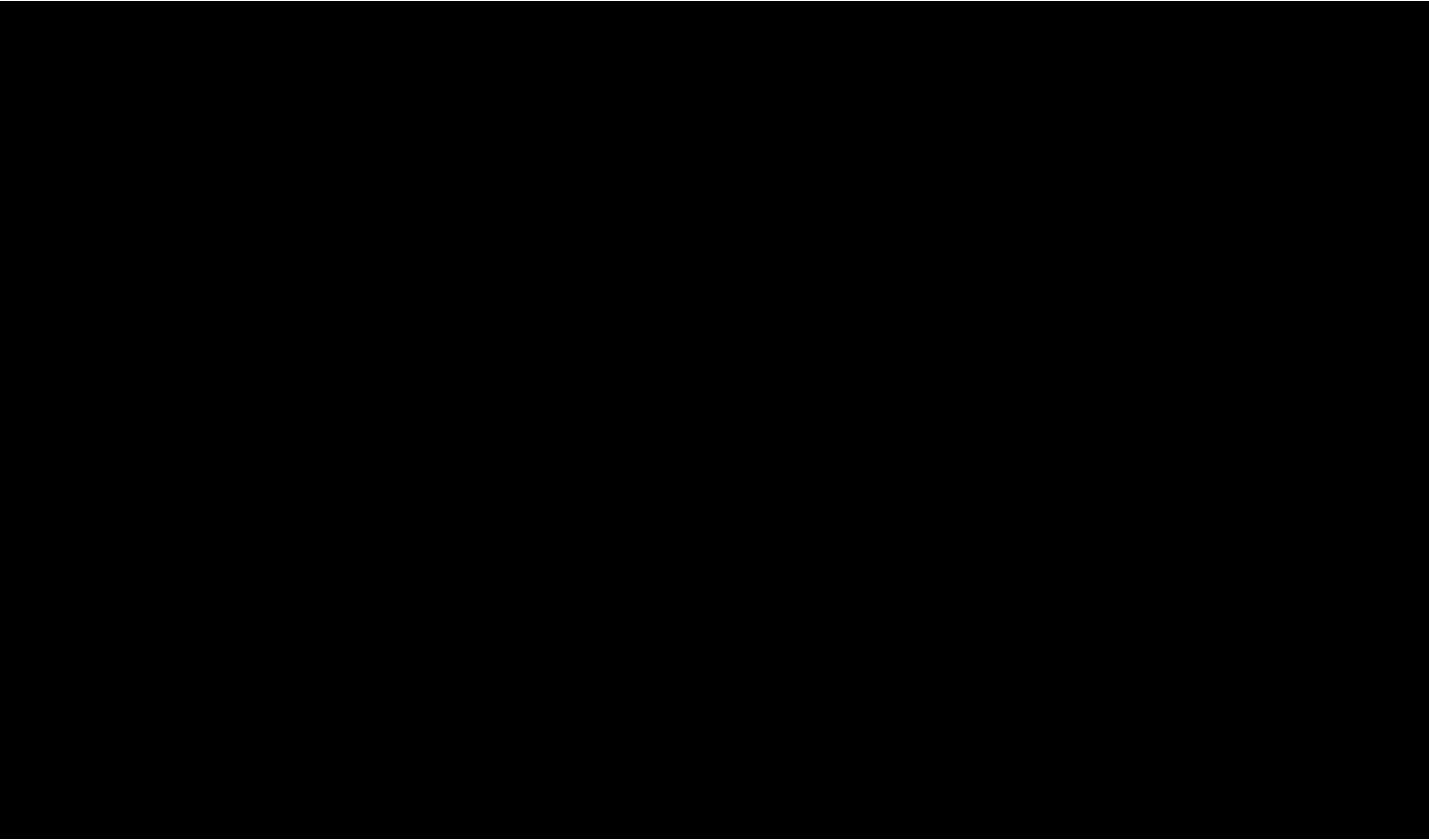
<p>Main Drivers</p>	<p>Primary investment driver for the Aberthaw project are customer connections. [REDACTED] new 132 kV strategic demand (data centre) drivers [REDACTED] Distribution Network Operator growth and [REDACTED] generators (PV & BESS, [REDACTED] are connecting at Aberthaw. [REDACTED] Demand drivers are [REDACTED] replacing existing capacity.</p> <p>Primary investment driver for the Aberthaw project is asset health, associated with the 1950s and 1960s substations, notably the 132 kV which require significant outages and capital investment to resolve. These considerations would be compounded by new customer works.</p>
<p>Selected Option</p>	<p>The proposed solution is option E-4: a new GIS 275 / 132 kV substation.</p>
<p>Estimated Cost & Timing</p>	<p>Estimated capital cost: £[REDACTED] (23/24 prices, inc. Risk & contingency)</p> <p>The delivery milestones for this project are:</p> <ul style="list-style-type: none"> October 2031: Initial energisation [REDACTED] October 2032: Secondary energisation [REDACTED] October 2033: Final energisation, completion of circuit transfers and DNO transfer <p>Dates are subject to procurement, contractor programme and confirmation of DNO programme.</p>
<p>Outputs</p>	<p>The preferred investment at Aberthaw will deliver key outputs for consumers and the wider network by rebuilding the 275/132 kV substation and facilitating Third Party Works.</p> <p>The investment at Aberthaw includes the construction of a new double busbar, 275 kV GIS substation with [REDACTED] to feed a new NGET infrastructure double busbar, 132 kV GIS substation and a new NGED double busbar 132 kV GSP. All existing circuits will be transferred from the existing legacy Aberthaw sites, with the legacy assets decommissioned.</p>

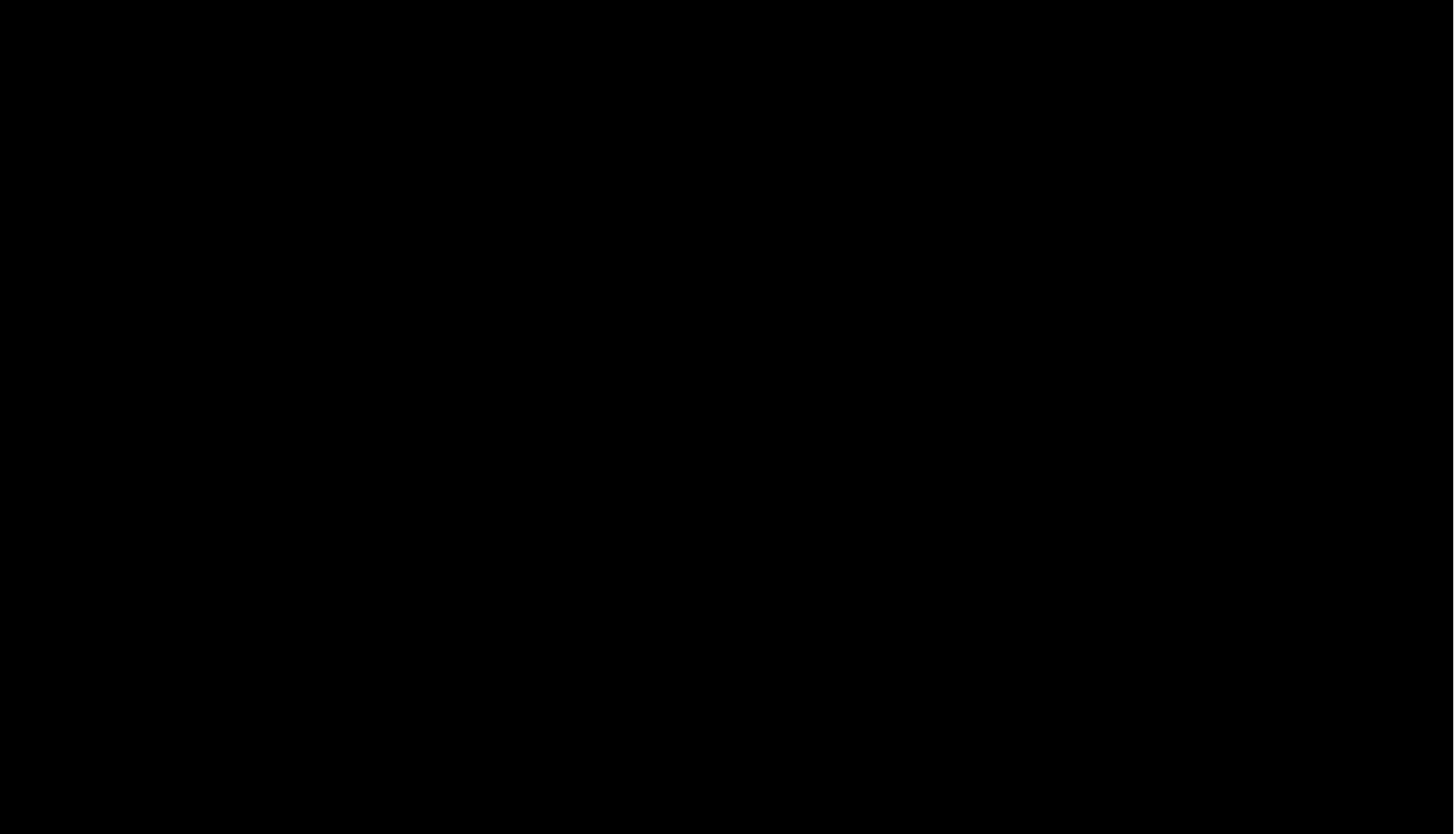
7. Appendices

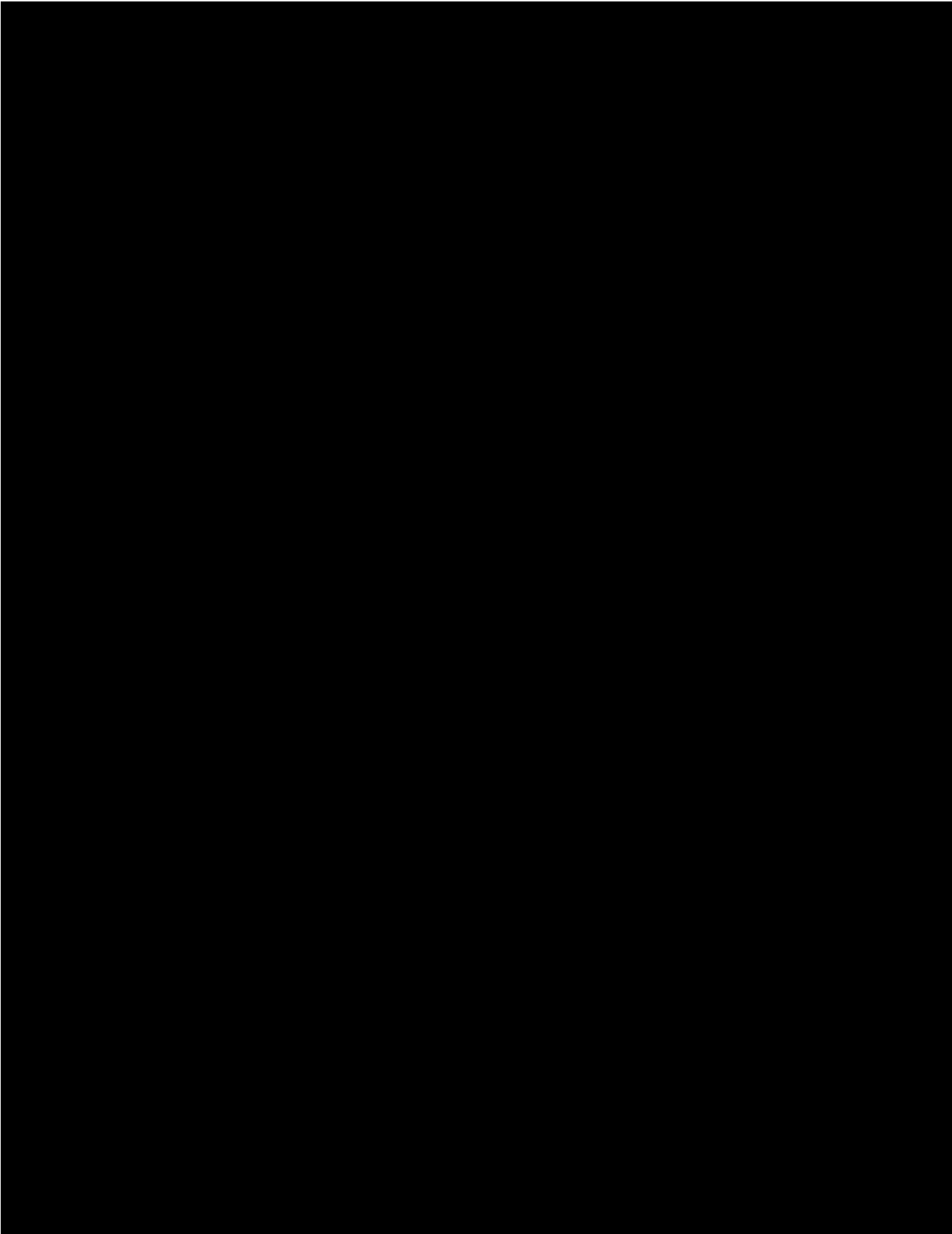


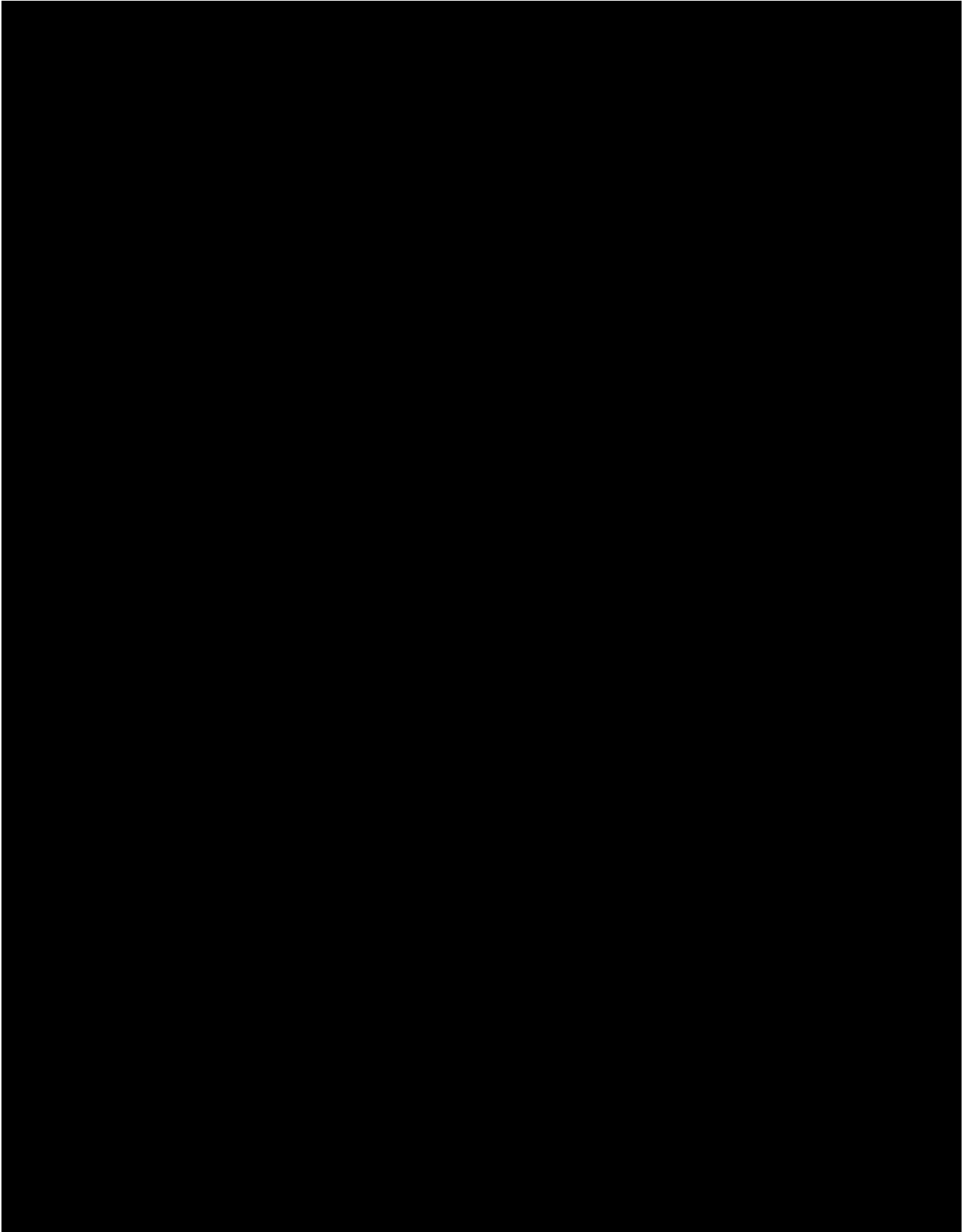


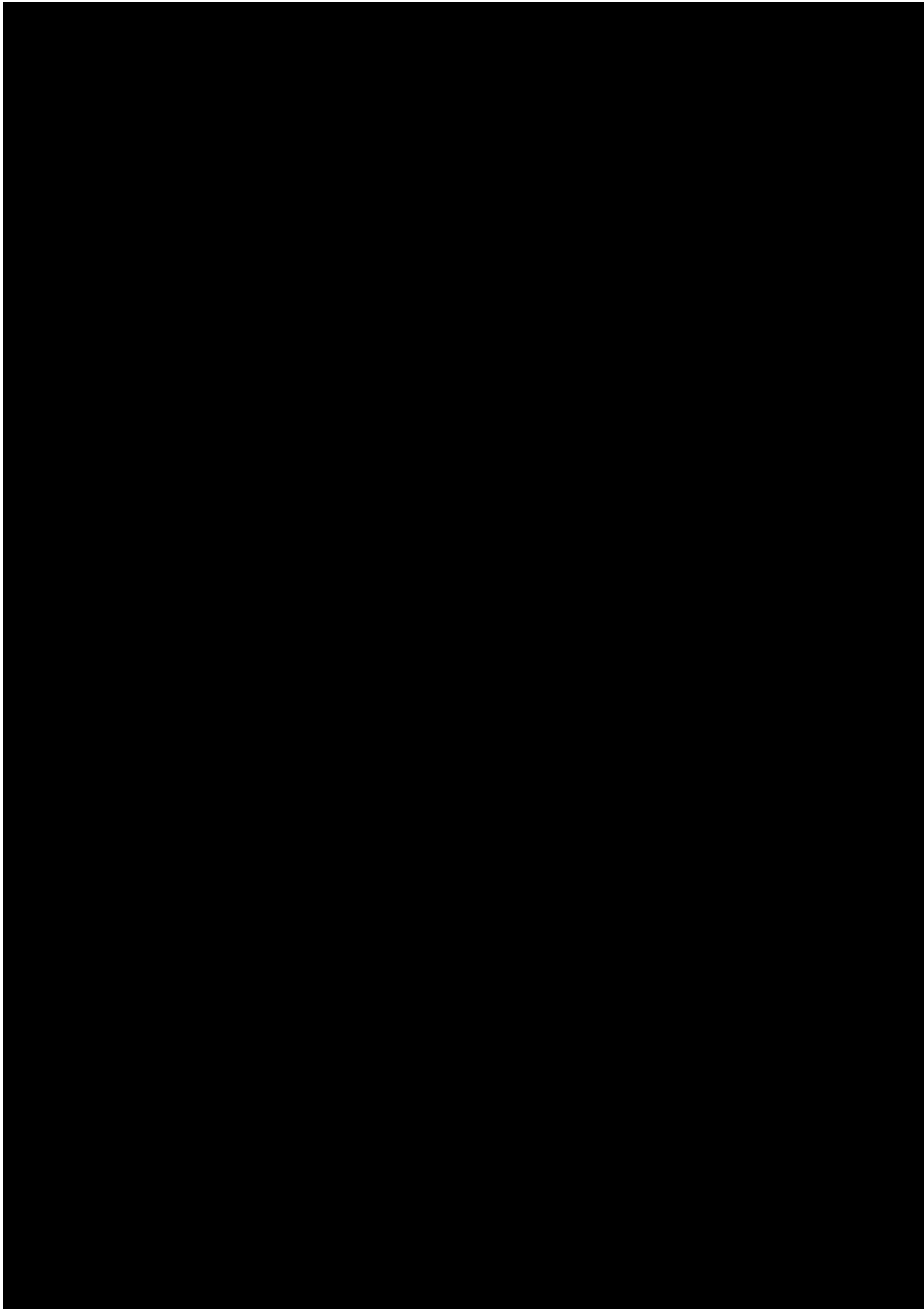












Appendix D: Third Party Works - Optioneering Analysis

To accommodate the 132 kV demand customers at [REDACTED] Third Party Works were triggered at the 132 kV. This involved a decision to split either the Cardiff NGED network or the Aberthaw 132 kV network. The intent of the TPW process is to have customers pay for localised upgrades. Given the significant work triggered by customers here, an in-depth assessment was undertaken to identify if undertaking this work had whole system benefits.

Table 22 – Optioneering analysis for Third Party Works

DNO Options	Option description	Preferred Option	Rationale
DNO1	Do Nothing - Customer triggering Third Party Works pays £50m+ to the DNO for their network split	Discounted	<ul style="list-style-type: none"> Whole-system cost: TPW appears cheapest at £61.5m (≈£7.3m less than DNO02) but relies on uncertain assumptions (e.g., an additional feeder bay at a substation already at capacity); costs likely to rise due to BSP extensions or new sites. [REDACTED] Network impact: Significant investment to split the group, reducing resilience, security and future demand headroom. Topology risk: [REDACTED] Power quality: [REDACTED] Commercial/legal: [REDACTED] Standards/compliance: [REDACTED] Evidence: NGED provided a formal report for the Ofgem funding submission.
DNO2	Network split at 132 kV level – i.e. there would be two Aberthaw 132 kV substations. One, NGET owned and operated as an infrastructure site. The Second, NGED owned and operated, fed by connection asset SGTs.	Selected	<ul style="list-style-type: none"> Selected with NGED and customers as the best whole-system value, aligning with Ofgem’s whole-system approach. Addresses the reasons for discounting DNO1 and provides stronger ACL and cost certainty. Consumer-funded (NGET infrastructure + DNO connection assets) [REDACTED] [REDACTED]

DNO Options	Option description	Preferred Option	Rationale
DNO3	As DNO2, however the substation would not be immediately split. Provides an insurance policy should NGET or NGED connection queues significantly alter removing the need to works.	Discounted	<ul style="list-style-type: none"> To mitigate the risk of customer termination stranding significant investment, a future split was considered. £9.9m higher than DNO2 (due to works to enable a future split) CBA break-even ≈2030, which is not persuasive given strong confidence in Bro Tathan and Vantage Data Centres.

A CBA was undertaken as a sensitivity analysis to consider NPV DNO3 where the breakeven point of lower up-front costs was offset by the higher overall scheme cost. [REDACTED] also likely to trigger the split meant that on balance, there was a need to address the requirement of a split. This therefore discounted DNO3 from consideration.

Table 23 below provides a summary of the NPV's for the three TPW options.

Table 23 – CBA output for third party works

Option	Total Additional Cost	NPV	NGET Infra-structure	NGET Connection	NGED Funded	TPW User	Description
DNO1	61.54	(91.23)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Rebuild as Single GSP. User incurs TPW costs
DNO2	68.84	(102.21)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Rebuild as Split GSP. <ul style="list-style-type: none"> DNO GSP (Connection Site) NGET Site (Infrastructure, 3 users)
DNO3	78.75 Now: 17.79 Later: 60.96	(108.60)	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	Rebuild as Single GSP, designed to be split into 2 GSPs later

Costs include an allowance for biodiversity net gain and [REDACTED] risk allowance to align to the primary CBA. It assumes the DNO is co-located on adjacent land. These costs have also been applied to the DNO quote for consistency of approach.

Of the two remaining options, DNO2 was selected (Aberthaw GSP split). This was considered to have the following advantages over DNO1:

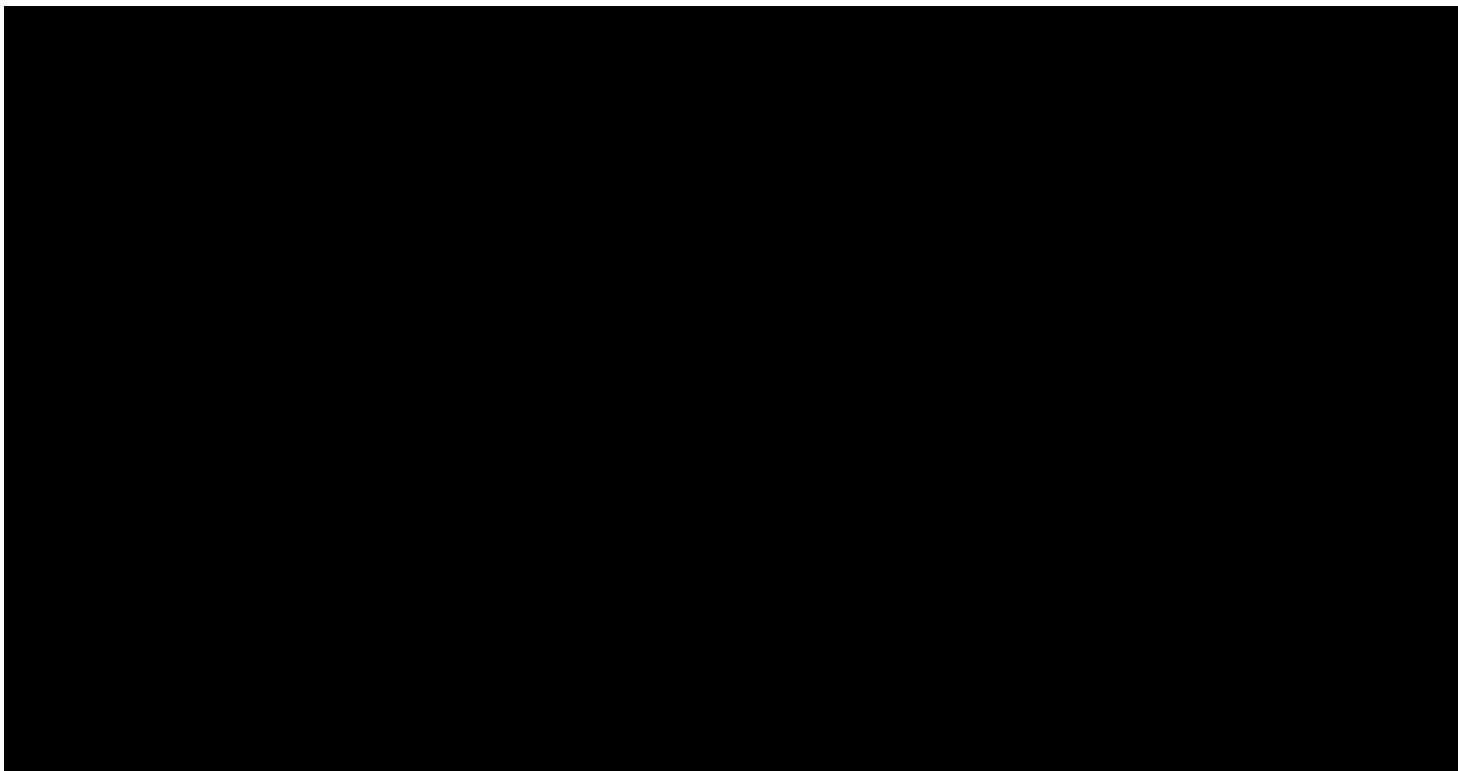
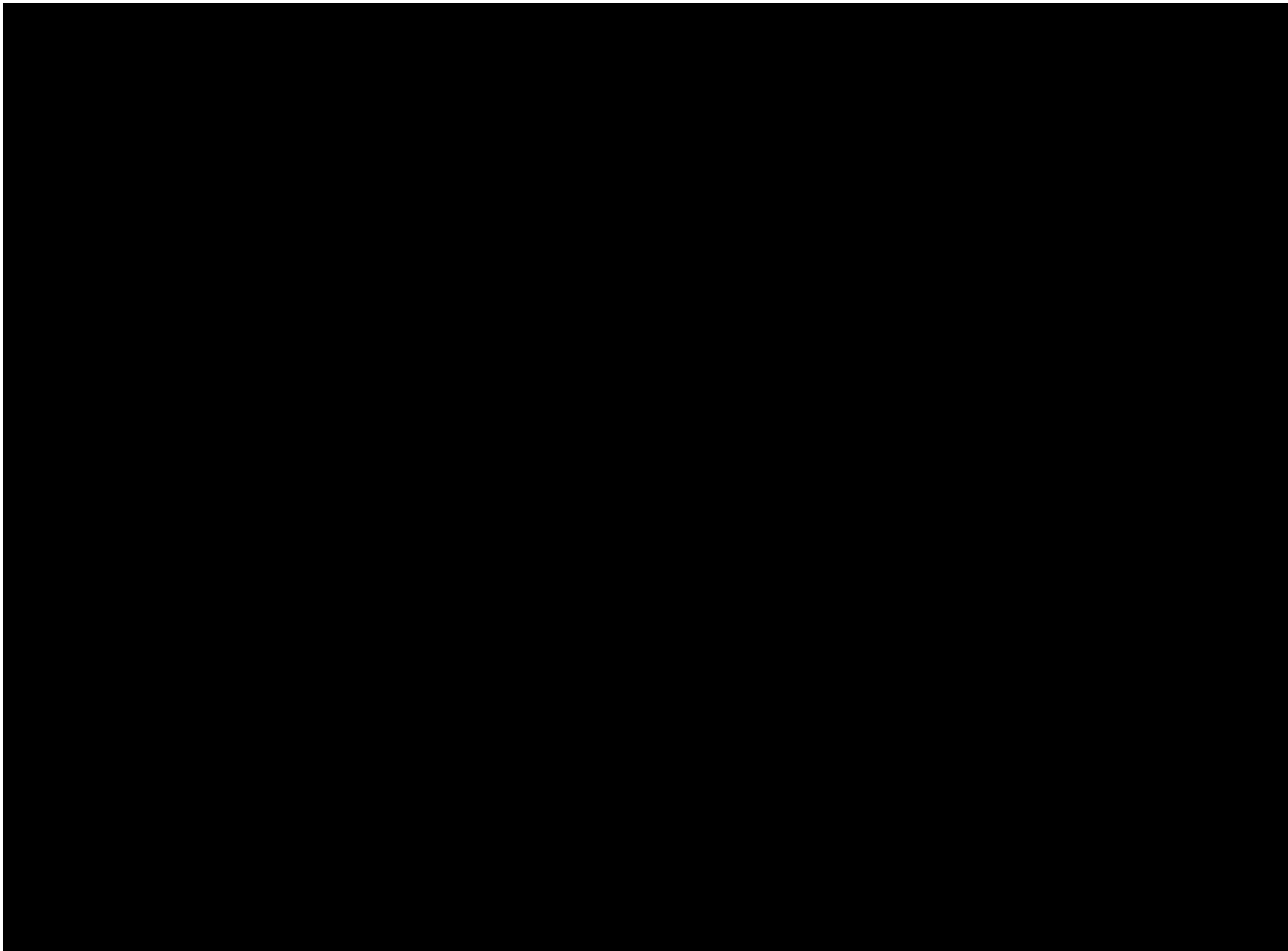
- Unreasonable burden on connecting customer for weakness within the distribution network, would affect the potential for future economic growth associated with the [REDACTED].

- Doubt that the £9.9m saving of the alternative option would be realised, due to high degree of risk from assumptions in the DNO quote.
- A DNO level split would adversely affect the resilience of the Cardiff demand group, noting it would still be technically compliant.
- The DNO level split required extensive works across multiple sites and would not be achievable within the rebuild timeframe. [REDACTED]
- A split at NGET level would significantly isolate future customer connection constraints from the DNO network.

Site Optimisation

Following the selection of the preferred solutions of Option E-4 and DNO2, an additional stage of optioneering was undertaken to optimise the site layout. Five layouts were produced and the preferred layout 6E was selected.

This layout is the lowest cost, highest NPV option that retains futureproofing for additional future SGTs and building capacity. It has OHL realignment for four circuits; however, the 5th is cabled reflecting engineering challenges of aligning the fifth circuit within the available space. The layout and SLD are presented below.



Appendix E: 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
GW	Giga Watt
HDD	Horizontal Directional Drilling
HV	High Voltage
HWUP	Hackney Waltham Cross Uprating
IEC	International Electrotechnical Commission
ISS	Integrated Security System
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
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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