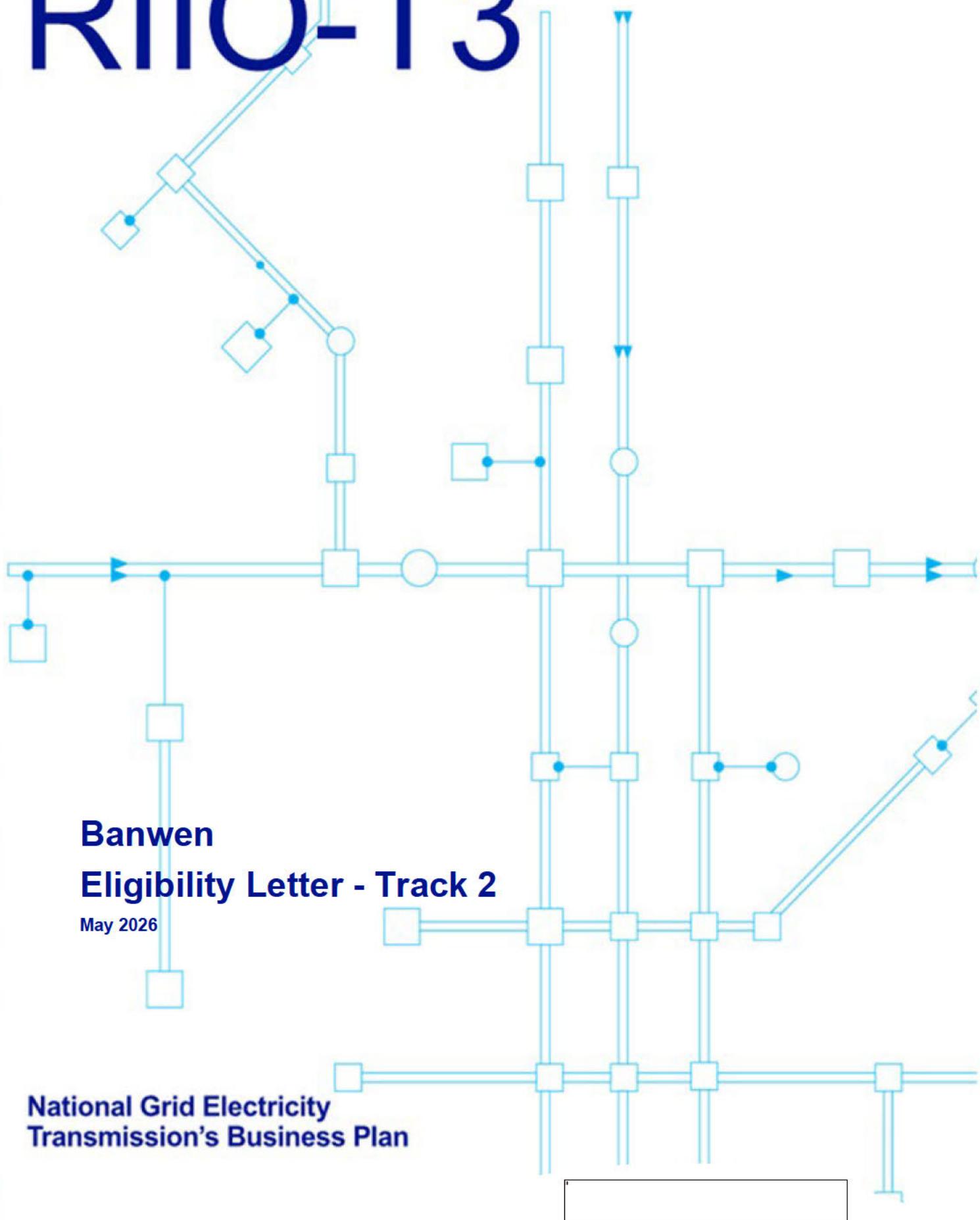


R110-T3



Banwen
Eligibility Letter - Track 2

May 2026

**National Grid Electricity
Transmission's Business Plan**



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Reference and summary table

Topic	Description
Name of Project	Banwen
TO's preferred re-opener track	Track 2 Eligibility Letter (EL)
RRP References	NGT500509
BPDT / Project Reference Number	NGT500509
Load Board Reference	NGT500509
Investment Driver	<p>Customer connections: Grid Supply Point [REDACTED] and a Gate 2 BESS customer.</p> <p>[REDACTED]</p> <p>Connections Reform update: [REDACTED] additional customers that formed part of the original customer background now hold Gate 1 offers. These customers do not form part of the immediate contracted delivery requirement, but they support retaining proportionate future optionality in the site layout and design:</p> <p>[REDACTED]</p>
PASE Alignment	PASE Primary
Outputs	Construction of a new double busbar, double circuit turn in 400 kV AIS substation [REDACTED], in the Hirwaun area by [REDACTED] during Stage 1 to provide a new GSP. Additional [REDACTED] SGTs in by during Stage 2.
Short list of strategic options considered	<p>Three main options were shortlisted for detailed analysis:</p> <ul style="list-style-type: none"> • Option E-1: New 400 kV double busbar double circuit turn in AIS substation on the Eastern side • Option E-2: New 400 kV double busbar double circuit turn in AIS substation on the Western side • Option E-3: New 400 kV GIS substation
Preferred solution and explanatory narrative on the rationale	The preferred option is Option E-1: New 400 kV AIS double busbar substation on the eastern side of the preferred site. This option was selected as it meets the contracted requirement with lower consenting and delivery risk than Option E-2 and preserves a more efficient route for future expansion if later customer need materialises. Whilst Option E-3 was a possible solution, we discounted it based on our policy of AIS first, unless there are any environmental, spatial and/or public visual amenity challenges.
Expected Forecast Costs	[REDACTED]
Delivery Year	<p>Stage 1: [REDACTED]</p> <p>Stage 2: [REDACTED]</p>

Extension cost	N/A		
Applicable Reporting Tables	BPDT 6.1 Scheme C&V Load Actuals and RRP 24-25 Scheme C&V Calc Load Actuals.		
Historic Funding interactions	Not applicable		
Interactive Projects	Coordination between Bridgend and Llandyfaelog will be required due to similar construction timelines.		
Spend Apportionment	T2 (FY 2022- FY 2026)	T3 (FY 2027 – FY 2031)	T4+ (FY 2032 – FY 2037+)
	■	■	■

1. Executive Summary

1.1 Project summary

The investment will create a new 400 kV connection node in South Wales, enabling [REDACTED] new GSP requirement and supporting wider future generation and storage connections in the region. It will improve security of supply, increase system operability and resilience, and provide a futureproofed platform for later customer growth.

The project also supports the connection of substantial volumes of low-carbon generation and storage, contributing to decarbonisation, wider net zero objectives, and regional economic growth and job creation. In addition, the preferred option provides a deliverable and proportionate design solution with manageable consenting risk and sufficient flexibility for future expansion as customer need matures, subject to Connections Reform.

1.2 Submission purpose

This Eligibility Letter and associated CBA are being submitted as part of the RIIO-ET3 Load Reopener (LR) mechanism under Special Condition 3.18 (Load Re-opener and Price Control Deliverable) of the Electricity Transmission Licence Conditions.

This submission is requesting Ofgem's approval of project eligibility against the Load Reopener criteria and seeks approval of the project's needs case and preferred solution for the Banwen project. This submission further requests Ofgem's determination on the appropriate track for the project and seeks Pre-Construction Funding (PCF) under Special Condition 3.15 (Pre-Construction Funding Re-opener, Price Control Deliverable).

1.3 Need

This investment is load-driven. Banwen is primarily driven by [REDACTED] requirement for a new [REDACTED] Grid Supply Point (GSP) in the Hirwaun area by 2031¹. In addition, one [REDACTED] Battery Energy Storage System (BESS) customer currently holds a Gate 2 offer and forms part of the near-term customer background.

At the time the original optioneering and design development were undertaken, the customer background included a total of [REDACTED] BESS applications in the [REDACTED]. Following Connections Reform, [REDACTED] of those customers now hold Gate 1 offers and therefore no longer form part of the immediate contracted delivery requirement.

However, this does not remove the need for a new 400 kV connection node in the area, as the existing Rhigos 400 kV substation does not provide an efficient route to serve [REDACTED] request for a new GSP. The minimum configuration required to meet [REDACTED] contracted demand cannot be physically or electrically accommodated at Rhigos 400 kV without disproportionate cost and risk, with further detail provided in Sections 1.4 and 4.3. Without this investment, we would be unable to meet our contractual and licence obligations to connect customers and maintain an efficient, coordinated and economical transmission system.

1.4 Optioneering

We undertook a structured, multi-factor optioneering process to identify a proportionate and deliverable solution in the interests of consumers. We first considered a range of strategic options, including do nothing, market-based, whole-system, reuse or extension of existing assets, and new-build.

From these, we developed a longlist of seven options, including extending the existing Rhigos 400 kV substation. The extension of the existing Rhigos 400 kV substation was assessed but discounted as it cannot provide a viable route to meet [REDACTED] GSP requirement. Rhigos 400 kV is near full



capacity, has only limited eastward extension potential, and cannot accommodate the two SGTs required for [REDACTED] without significant civil works, Section 106 boundary impacts and constrained layout risks. Further expansion would also create material consenting and environmental risk due to protected species and sensitive peat bog habitat. Further detail is explained in Section 4.3.

We then shortlisted three options for detailed analysis: Option E-1 (400 kV AIS East), Option E-2 (400 kV AIS West) and Option E-3 (400 kV GIS). Of these, Option E-1 is our preferred solution because it performs better across constructability, environmental performance, future expandability and delivery risk factors, while fully meeting the system and customer connection drivers. Supportive evidence and detailed analysis of the preferred option is set out in Section 4.

The proposed substation design continues to preserve future optionality for customers currently at Gate 1. At this stage, however, the firm investment need is limited to [REDACTED] and the [REDACTED] BESS customer with a Gate 2 offer.

Table 1: Summary of optioneering longlist

Option	Details	Drivers met?	New site?	AIS/ GIS?	PASE	Short List?	Preferred Option
Option A	Do nothing counterfactual option	No	No	N/A	N/A	X	X
Option B	Market-based solution	No	No	N/A	N/A	X	X
Option C	Non-transmission, whole systems solutions (DNO)	No	No	N/A	N/A	X	X
Option D	Extension of the existing Rhigos 400 kV substation	Partially	No	AIS	Variant	X	X
Option E-1	New 400 kV double busbar, double circuit turn-in AIS substation (East)	All	Yes	AIS	Primary	✓	✓
Option E-2	New 400 kV double busbar, double circuit turn-in AIS substation (West)	All	Yes	AIS	Primary	✓	X
Option E-2	New 400 kV GIS substation	All	Yes	GIS	Non-compliant	✓	X

1.5 Cost Estimates

Option E-1 is the lowest-cost shortlisted option. The other shortlisted options reflect different trade-offs between the eastern and western AIS layouts within the preferred development area and the use of GIS technology as a compact alternative. These trade-offs relate primarily to differences in earthworks, overhead line entry arrangements, interaction with environmental features, overall construction complexity and the extent of future flexibility preserved within the site.

Indicative cost estimates, based on NGET's latest Cost Book using 2023/24 prices, range from [REDACTED] for Option E-1 through to [REDACTED] for Option E-3. These differences principally reflect:

- the extent of overhead line entry works;
- associated cable requirements;
- the greater earthworks, mitigation and construction complexity associated with the western AIS layout

1.6 Indicative delivery programme

The project is currently planned for staged delivery to align with customer requirements and wider future need. Stage 1 is currently aligned to the [REDACTED] requirement in 2031 [REDACTED] with Stage 2 providing for additional future capacity in 2037. As set out in Sections 2, 3 and 4.7, the scale and timing of the later phase continue to be reviewed in light of Connections Reform, with the immediate build focused on [REDACTED] contracted need and Gate 2 BESS customer, while retaining futureproofing for later customers currently holding Gate 1 offers.

2. Introduction

2.1 Banwen

This paper presents an Eligibility Letter application under the Load Re-opener and Price Control Deliverable Special Condition for investment in Banwen. It seeks the following approvals:

- Eligibility for submission under the Load Re-opener and Price Control Deliverable under Special Condition 3.18;
- Approval of the investment drivers, optioneering process to date and our preferred option, which is to develop a new 400 kV AIS double-busbar substation at Banwen;
- Confirmation of the proposed Track 2 EL assessment route because the needs case is clear and the preferred solution is PASE compliant;
- and Pre-Construction Funding (PCF) under Special Condition 3.15.

The investment is load-driven, with customer details explained in Section 3.

Banwen is the development stage of the internal NGET process, where an option has been selected and is now being devolved in detail by design and required surveys. Hence it is relatively mature, with detailed siting and optioneering completed and a preferred new site and substation option selected through that process.

2.1.1 Eligibility & Project Track Statement

Banwen is driven by [REDACTED] requirement for a new Grid Supply Point (GSP) in the Hirwaun area, along with a contracted Gate 2 BESS customer. The existing Rhigos 400 kV substation could not accommodate these connections within the site's existing capacity due to significant ecological, consenting, and constructability constraints, with further details explained in Section 2.2.3.

The investment is load-driven and triggered by contracted customer requirements and completion dates. We are submitting this project under Assessment Track 2 EL because the preferred solution is PASE-compliant and includes a new build 400 kV AIS double-busbar, double circuit turn-in substation.

2.1.2 Pre-Construction Funding Request

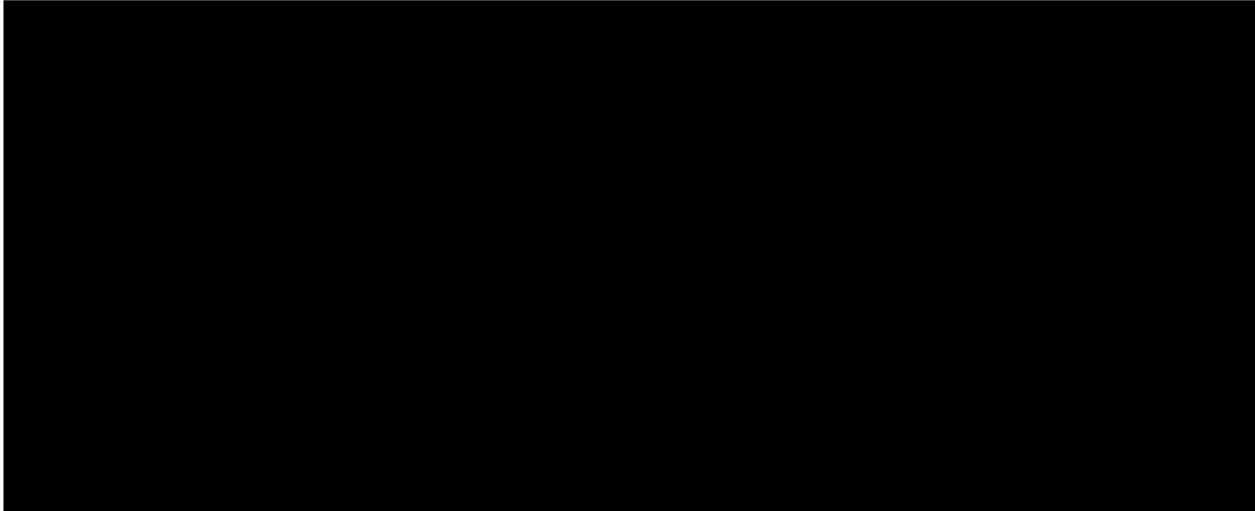
Under Special Condition 3.15 of the Electricity Transmission licence, this investment qualifies for allowances equal to [REDACTED]

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] contracted BESS customers have now a Gate 1 offer.



2.2 Background

2.2.1 Chronology to the investment

This project has been initiated because of [redacted] triggering a new GSP in the Hirwaun area of South Wales. The DNO ([redacted]) applied for a new Grid connection near Rhigos 400 kV in [redacted] seeking a firm connection with a capacity of [redacted]. Additionally, the Project Progression connection requested further capacity for [redacted]. System studies determined that these requirements necessitate a 400 kV substation [redacted].

The demand for this GSP was further substantiated by 7 Solar Battery Energy Storage System (BESS) generation customer connection applications [redacted]. However, as stated in Section 1, due to Connections Reform, only one BESS customer now has a Gate 2 offer [redacted].

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

Figure 1: Summary of chronology



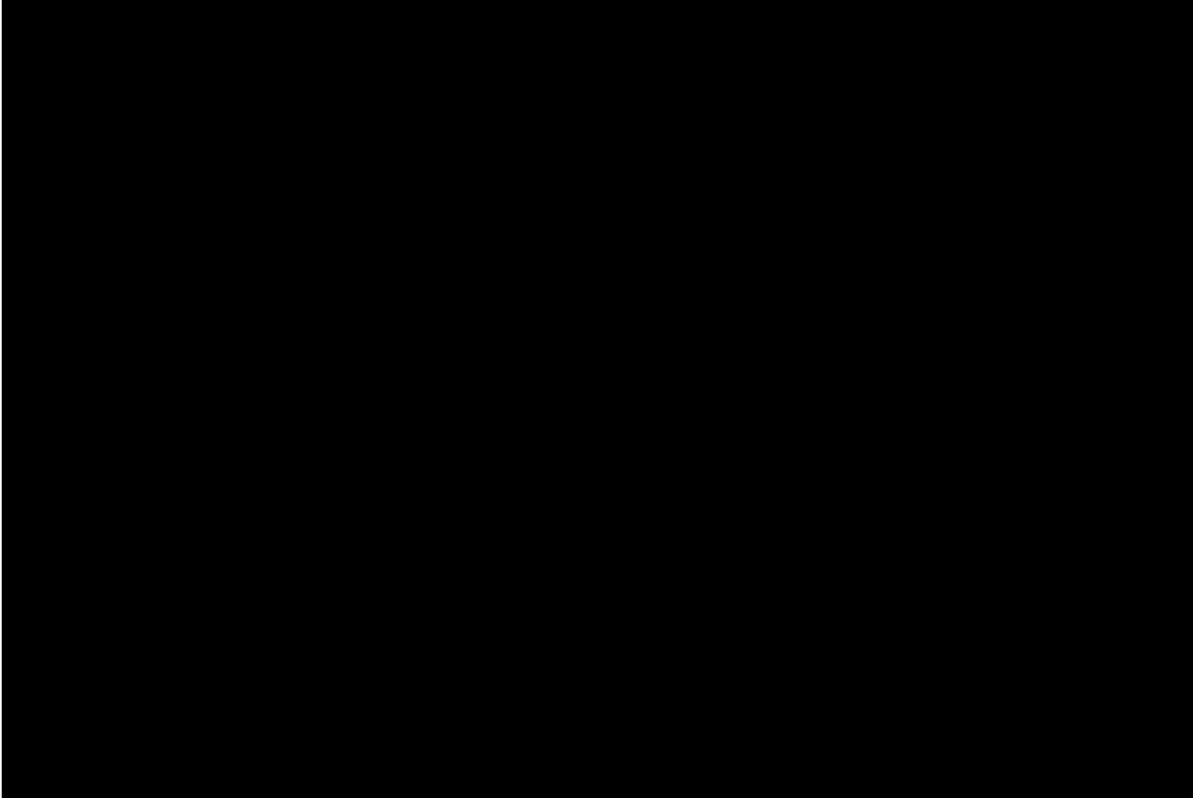
2.2.2 Regional & Network Context

The existing proposed site at Banwen will be a critical node on South Wales power flow, specifically with respect to the growing generation and connection demand in the region. Banwen occupies a

strategically important position within South Wales. This is one of Wales' most densely populated region, serving approximately one million households and 2.3 million people, and supporting one of the UK's largest industrial hubs.

The UK Government has designated South Wales as an AI Growth Zone. Significant growth in South Wales is driving the need for new transmission infrastructure, with multiple new substations already required across the region. Several new substations in the South Wales region are required to accommodate the increasing load, customer connections and to address system access constraints. Figure 2 below provides a schematic illustration of the existing network in the South Wales region.

Banwen has also been linked to the 400 kV circuit upgrades that are a part of the regional reinforcement strategy. There will also a be a Pembroke-Wallam OHL circuit turn in at Llandyfaelog before the planned OHL circuit route will be completed.



2.2.4 Site Background

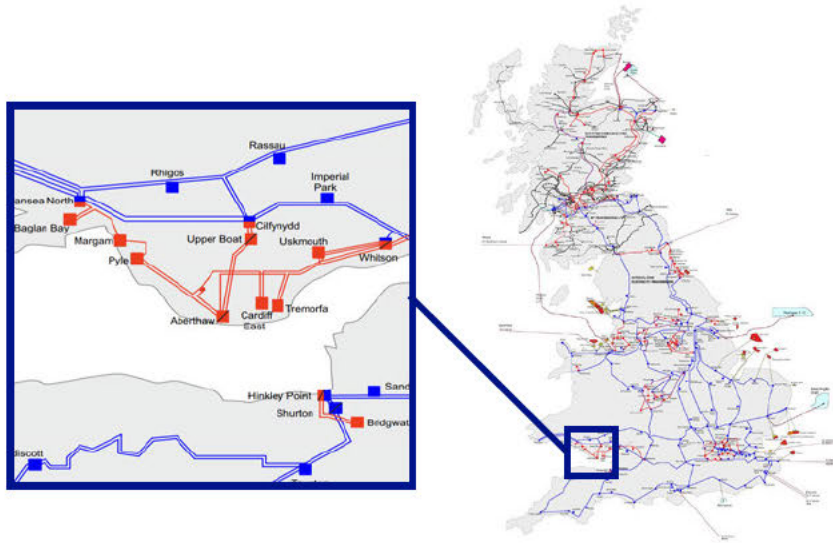
The proposed site for Banwen is Onllwyn (Neath Port Talbot County borough, South Wales), [REDACTED]. The surrounding landscape is predominantly woodlands and agricultural fields. Immediately to the north lies the village of Banwen Pyrddin, with Banwen situated [REDACTED].

The existing substation at Rhigos is a 400 kV AIS double-busbar transmission substation, constructed in 2015, located at Hirwaun Industrial Estate in South Wales. The site was developed on previously disturbed land, including areas of historic landfill and peat, and was delivered with extensive ground treatment measures, including piled foundations and a raised platform, to mitigate ground risk and ensure long-term asset stability.

The site currently comprises [REDACTED]. Rhigos 400 kV operates as a pure transmission node [REDACTED]. The substation is connected to the wider transmission network via the Rhigos–Swansea North and Cilfynydd–Rhigos 400 kV overhead line circuits.

The existing Rhigos 400 kV substation has no asset health risks, with none of its assets listed as medium-high to very high in asset health risk score. As such, there is no requirement for Banwen to be a rebuild of Rhigos 400 kV. Banwen is being progressed as a separate load-driven reinforcement, and the enduring network strategy is for both Rhigos 400 kV and Banwen to remain as operational network points.

Figure 4: Location of Rhigos 400 kV in NGET's network



2.2.5 Historical Funding

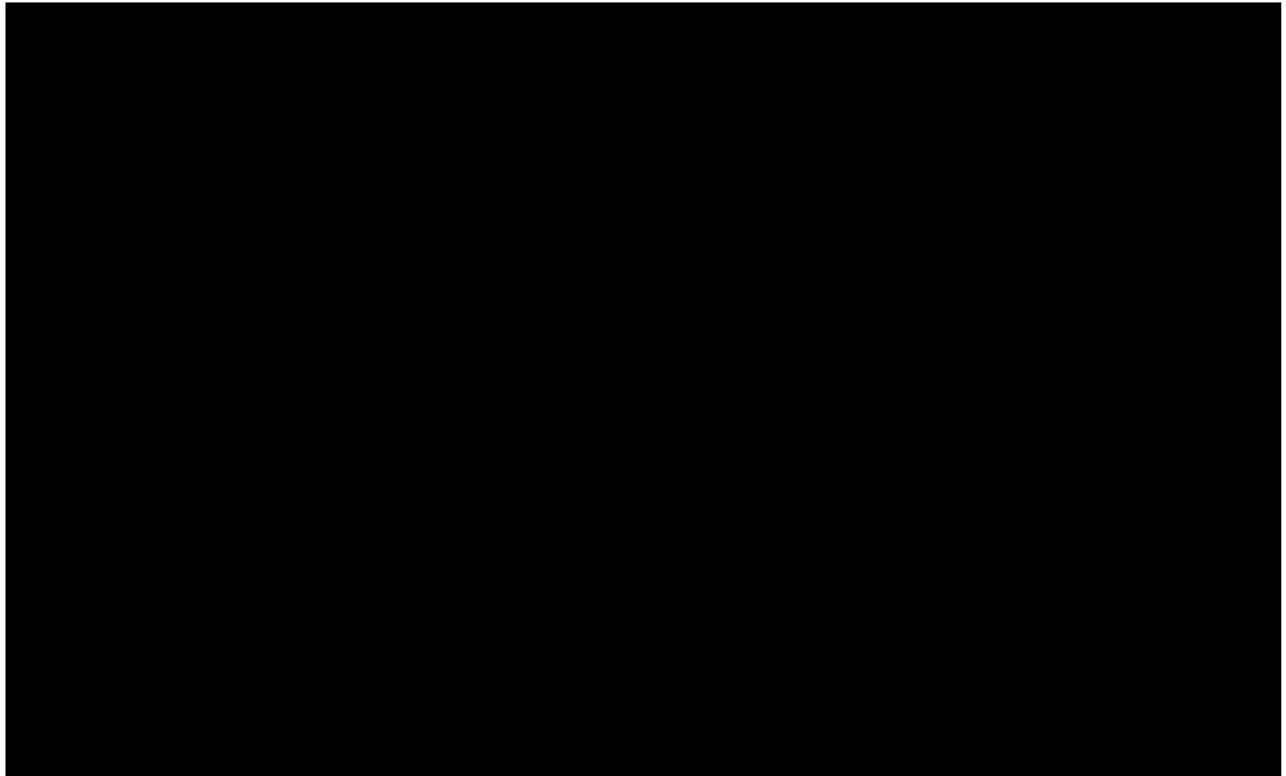
There is no historical funding for this project.

2.2.6 Early Asset Write Offs (EAWO)

Not applicable.

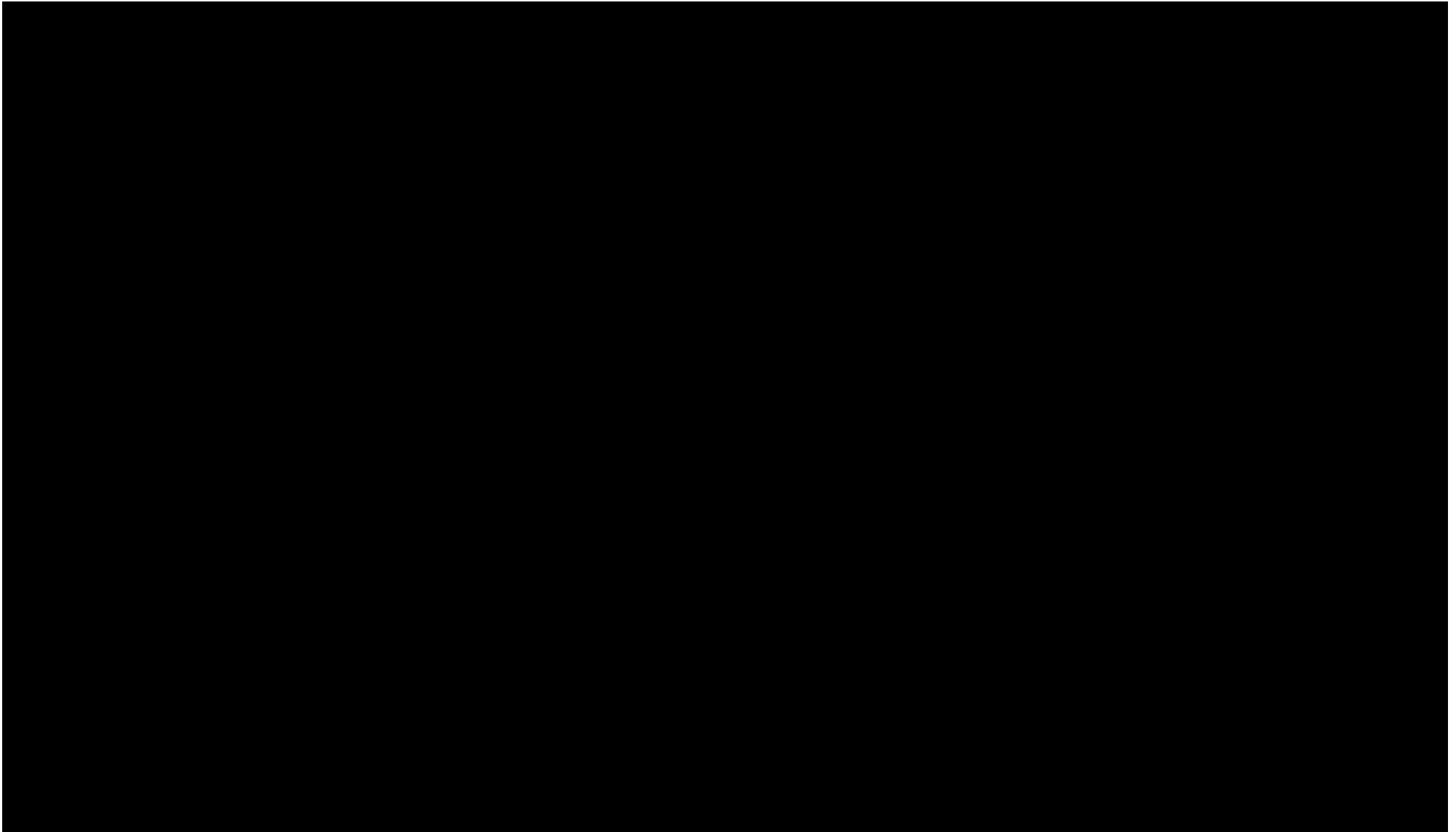
3. Drivers & Needs Case

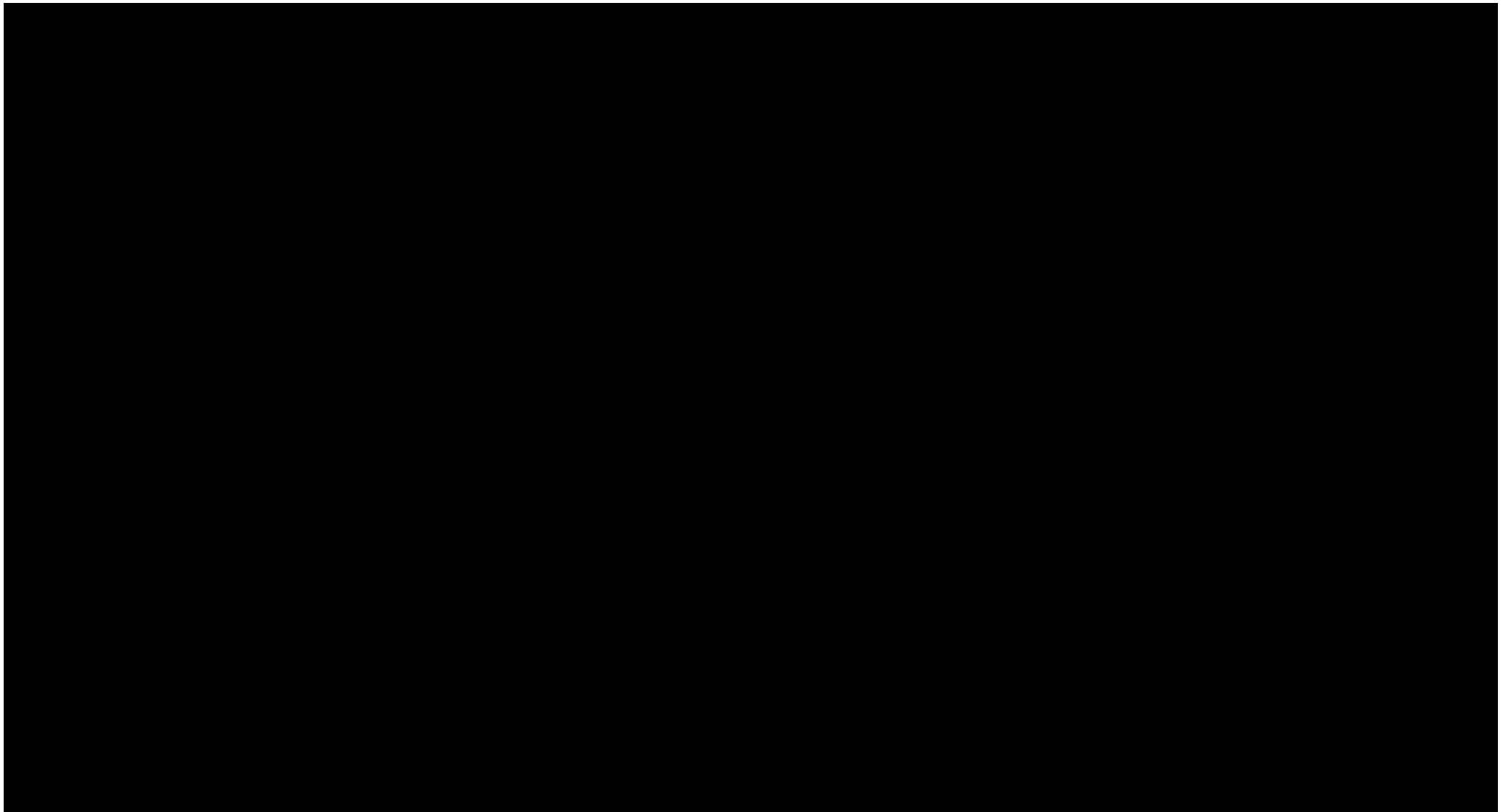
Banwen is a load-driven investment primarily required to deliver [REDACTED] contracted demand requirement for a new [REDACTED] GSP in the Hirwaun area. One [REDACTED] BESS customer currently holds a Gate 2 offer while [REDACTED] further customers, that were part of the original customer set, now hold Gate 1 offers following Connections Reform, and therefore do not form part of the immediate delivery requirement. Accordingly, the immediate Stage 1 build is sized around [REDACTED] GSP requirement.



In addition to the contracted customers, there is large scale customer activity emerging in the region including Data Centre interest. During the connection reform pause, a transitional offer was received from a future data centre looking to connect [REDACTED], however their application has not been progressed due to Connections Reform queue pause.

3.1 Customers





3.2 Asset health

Though the selection of the preferred load-driven intervention may affect how we manage the health of interfacing assets, there is currently no asset health driver directly associated with this scheme.

4. Optioneering

4.1 Strategic Options

In line with our standard optioneering process, we considered the following broad strategic options:

Table 5: 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.

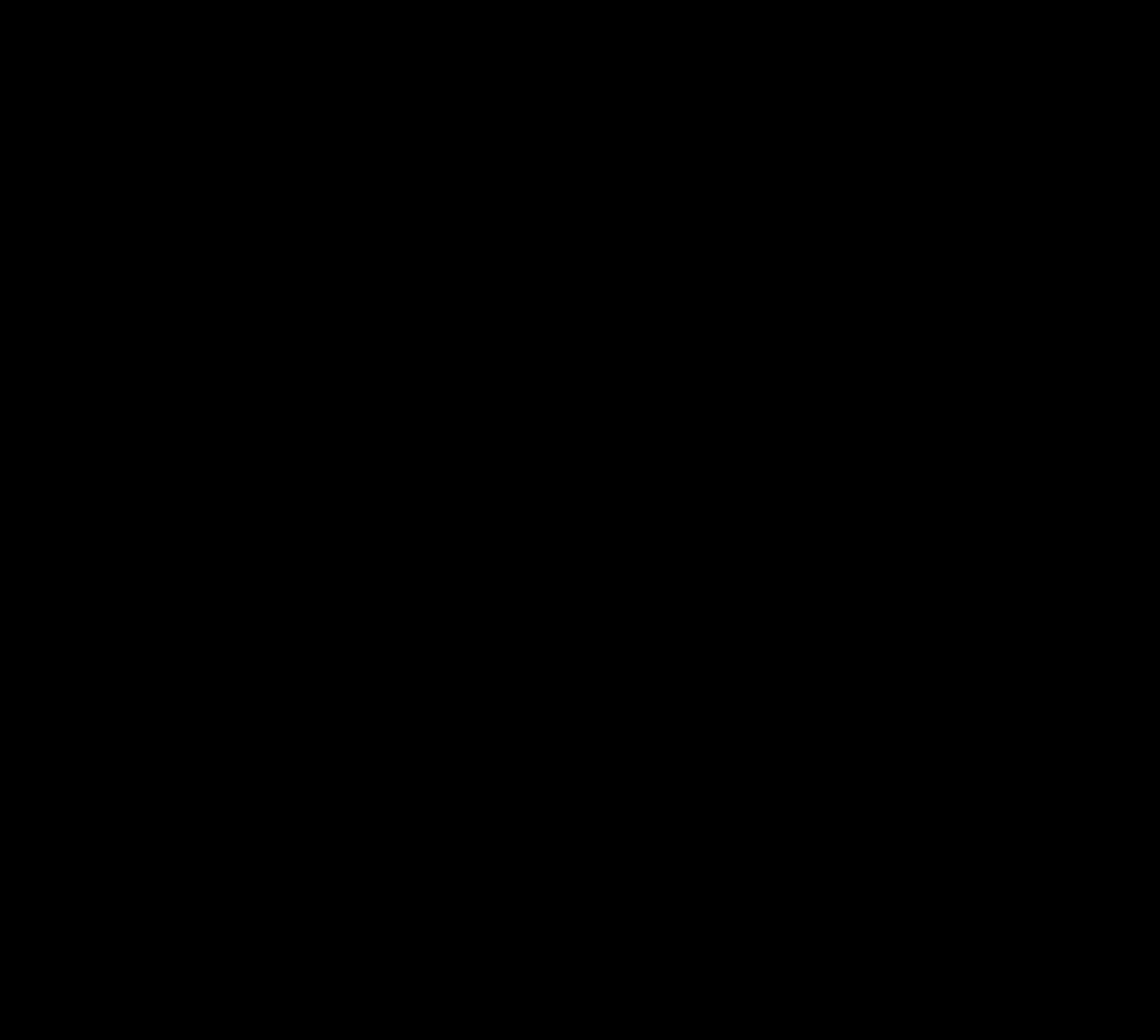
Due to licence and contractual obligations and the inability to facilitate connection requests, Options A, B and C were discounted early in our optioneering process. A descriptive rationale is provided in Section 4.3, Table 7.

Option D was discounted because the existing Rhigos 400 kV substation is near full capacity and cannot be extended to accommodate [REDACTED] GSP requirement due to significant engineering and ecological challenges. Further detail is provided in Section 4.3, Table 7.

4.2 Siting

NGET engaged [REDACTED] to undertake a siting study to find a suitable site within the 2-kilometre radius study area [REDACTED]

[REDACTED] The sites within the scope of the study are shown in Figure 5 below.



The siting study combined Geographical Information Systems (GIS) constraints mapping, planning appraisal, site visits and engineering input from Jacobs. 30 sites were identified across coupled AIS/GIS sites, decoupled AIS/GIS sites and wider development areas that allowed micro-siting of the final layout.

Each candidate site was assessed through a Candidate Site Methodology Matrix (CSMM), which considered consenting and delivery risks, and the findings were then validated through site visits in July 2024 and December 2024. A preferred site workshop on 22 January 2025 then compared the most credible sites through a Summary Comparison of Strategic Options (SCOT) appraisal to identify the best-performing site.

30 sites were identified in the longlist screening and they were assessed based on the following criteria:

- Environmental and planning constraints;
- Landscape and visual effects;
- Residential amenities and socio-economic effects;
- Access and traffic;
- Heritage and archaeology; and
- Land, consenting and programme risk

The longlist confirmed that most candidate sites could be discounted on one or more of the following recurring grounds:

- Western sites around Seahill Road and the Dulais Valley generally exhibited steep or undulating topography, significant earthworks requirements and constrained/shared access arrangements, increasing constructability and programme risk.
- Several sites were constrained by Common Land, which would have introduced additional consenting complexity and replacement land requirements (please see Appendix B to see our position on Common Land);
- Some sites were either within, or too closely connected to, sensitive environmental receptors, including statutory designated sites and watercourses that would likely have required culverting or diversion contrary to the stepwise approach and planning guidance;
- Several sites were visually prominent because of elevated landform or proximity to the Brecon Beacons National Park or the Dulais Valley Special Landscape Area, increasing landscape and visual risk;
- Some sites sat in close proximity to residential receptors at a lower elevation, creating greater risk of overbearing, noise and objection;
- Certain eastern development areas were also affected by extant development proposals, including solar farm permissions, which increased land and consenting risk without offering sufficient offsetting benefits.

Following longlist screening, three development areas were progressed to preferred site assessment:

- SWSWA-DEV4
- SWSWA-DEV5
- SWSWA-DEV6

These were the only sites that remained credible when the environmental, technical, access, land and consenting factors were considered together.

A comparative assessment of the shortlisted Sites was undertaken using the SCOT appraisal which assessed the technical, environmental and socio-economic factors impacting the development of each site. In addition, as part of our Environmental study, "RAG" (Red, Amber, Green) analysis was conducted for the shortlisted Site Options, with a summary of the results shown in Table 6 below.

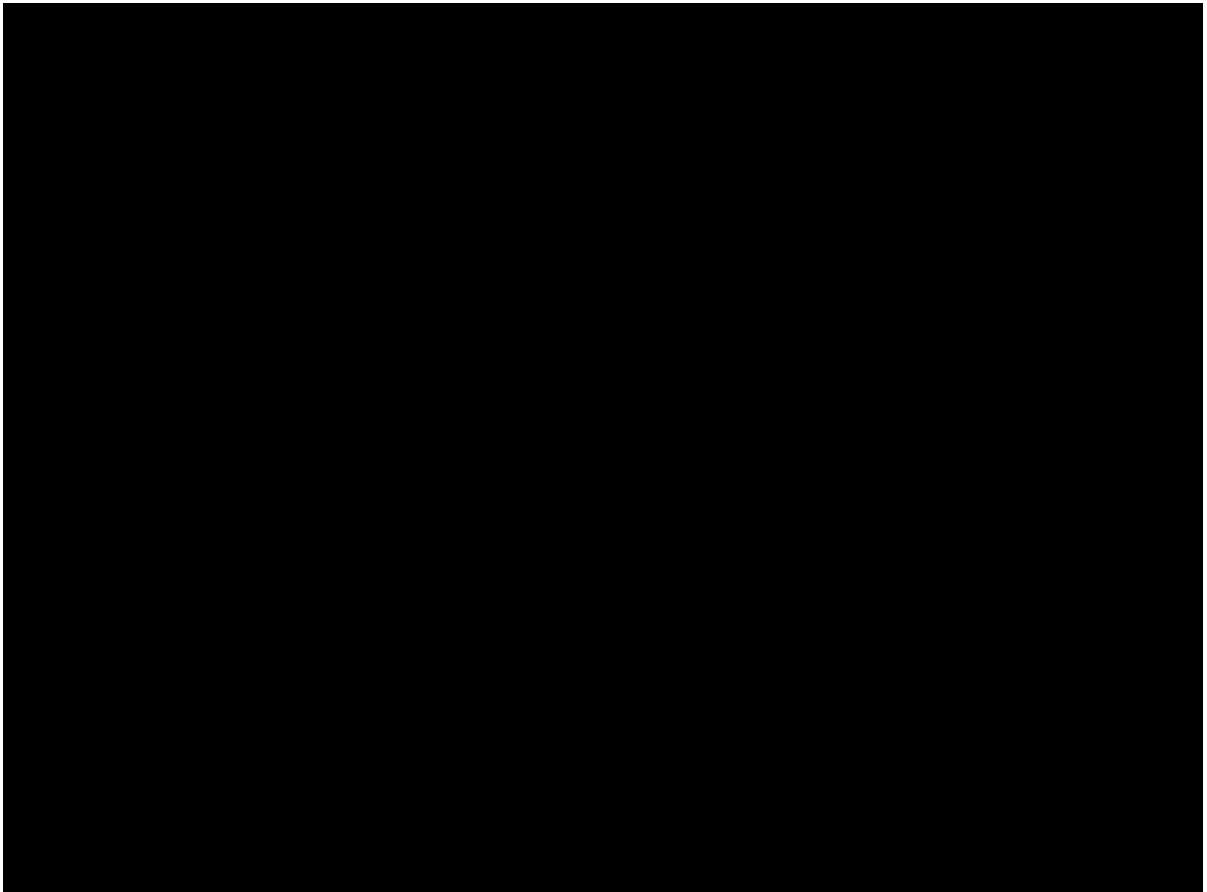
Table 6: RAG analysis of shortlisted Site Options

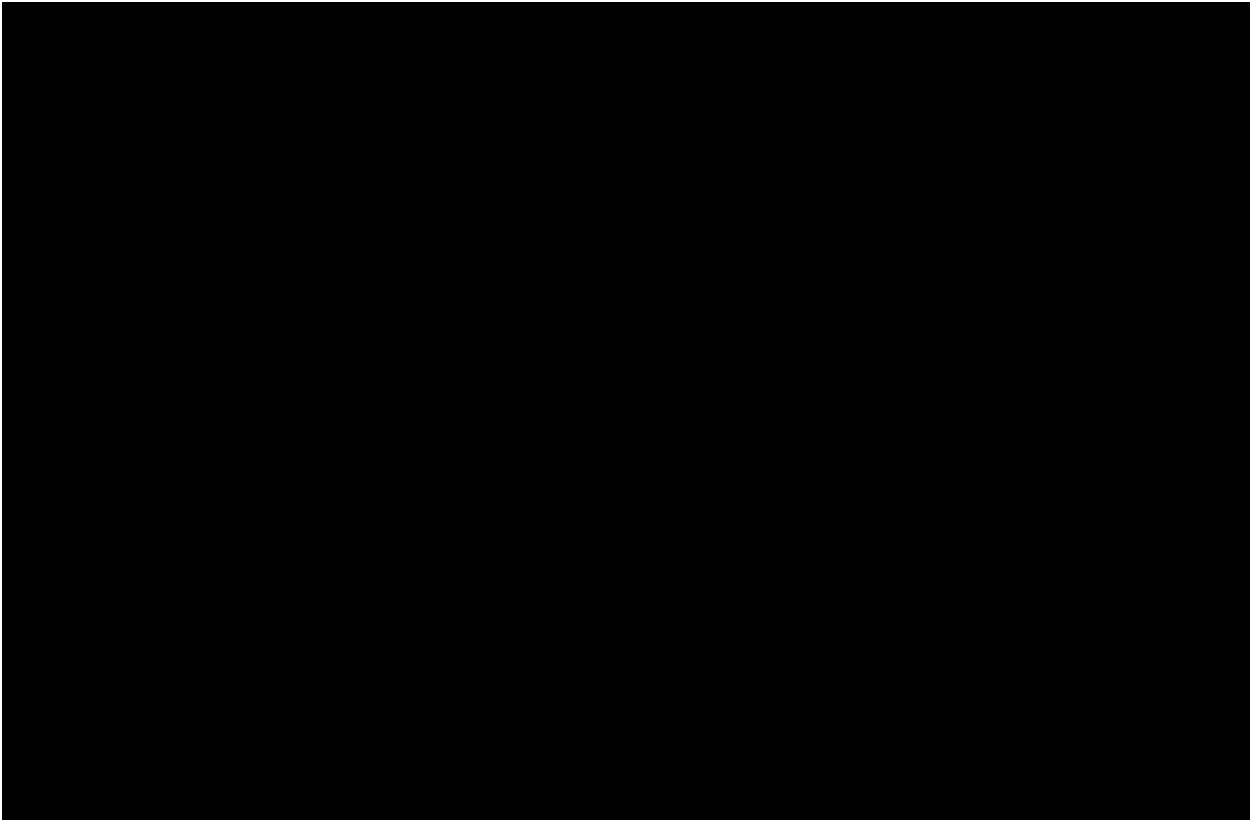
Site Option	SWSWA-DEV4	SWSWA-DEV5	SWSWA-DEV6
Biodiversity	Outside statutory designations, but close to [REDACTED]; mitigation and careful micro siting required.	Outside statutory designations and further from key SSSIs than DEV4, but the onsite water feature and habitat interfaces still present ecological risk.	Outside the SSSI boundary, but potential hydrological connectivity to [REDACTED] increases ecological and consultation.
Landscape and Visual	[REDACTED] Not in a designated landscape, but within the National Park setting; mitigation through micro siting and screening likely.	[REDACTED] with topography limiting intervisibility. Elevated position increases landscape and visual sensitivity.	[REDACTED] Elevated, constrained setting increases the likelihood of significant residual.
Historic Environment	No designated heritage assets within the site. Scheduled Monuments north of the A4109 are separated by distance and intervening infrastructure; assessment and consultation required.	No designated heritage assets within the site, but archaeological potential means further survey is likely.	No designated heritage assets within the site, but nearby historic and industrial features increase archaeological risk and consultation requirements
Geodiversity and Agricultural Land	No statutory designations within the site. Nearest SSSI is approximately [REDACTED] with no direct hydrological link; impacts are manageable with mitigation.	No statutory designations within the site. Nearest SSSI is approximately [REDACTED] but the onsite watercourse may increase ecological and consenting risk.	No statutory designations within the site, but Nant-y-Rhos SSSI is approximately [REDACTED]
Water Environment	Flood Zone 1 with minor surface water features; drainage and flood risk are manageable.	Flood Zone 1, but an open watercourse crosses the site. Culverting or diversion may increase consenting risk.	Watercourses cross the site and may connect hydrologically to the SSSI. Water constraints are a key issue.
Noise	Construction noise manageable with standard controls; operational noise within limits.	Elevated siting increases overbearing and noise risk, with less scope for mitigation.	Elevated, constrained position increases noise, amenity and objection risk.

Socio-economic	Residential properties [REDACTED] [REDACTED] Screening and layout design should help manage overbearing, noise and visual effects.	Proximity to homes and informal land use around [REDACTED] increases objection and disruption risk.	Residential property immediately south, shared access and greater interaction with neighbouring land users increase stakeholder and community impact.
Technical (Safety)	Compliant with NGET safety standards; clear separation distances and unconstrained construction.	More constrained working areas elevate construction safety risk.	Enhanced operational safety from enclosed equipment; construction complexity remains
Technical (OHL)	Straightforward double-circuit turn-in with minimal deviation from existing routes.	OHL connection is feasible, but less efficient than DEV4; the more complex alignment increases outage and construction risk.	The site's restricted developable area and proximity to the existing alignment significantly limit OHL layout flexibility and prevent an AIS solution. OHL development only possible if only GIS option so no further study of this.
Technical (Constructability)	Broadly flat site with gentle gradients (c. 3%), reducing cut and fill, programme risk and cost.	Sloping topography (c. 8%) increases earthworks and reduces constructability efficiency.	Valleys and watercourses constrain the layout and significantly reduce constructability.
Cost	Lowest cost and programme risk, with favourable topography, access and layout flexibility. Can accommodate AIS or GIS.	Higher cost and programme risk due to earthworks, access upgrades and residential mitigation.	Highest cost and programme risk due to constrained layout, water issues and inability to accommodate AIS.
Consenting, Lands and Programme	Consenting risks from the National Park setting, nearby homes and archaeology are manageable and proportionate.	Elevated siting, residential amenity effects and the watercourse create a more difficult consenting and programme position than DEV4.	Highest consenting and programme risk due to SSSI linkage, constrained layout, shared access and GIS-only.

As a summary, from our initial siting options appraisal:

- **SWSWA-DEV4 emerged as the preferred site** because it provides the strongest overall balance between engineering feasibility, environmental performance, deliverability and consenting risk. SWSWA-DEV4 was identified as the best performing from a technical perspective regarding constructability and connections to the existing Rhigos overhead line alignment. The Development Area demonstrates the ability to accommodate either AIS or GIS configurations, like SWSWA-DEV5. SWSWA-DEV6 could not accommodate an AIS configuration due to the proximity of the overhead line alignment, watercourse crossing restricting the developable area of the site and significant landform valley to the western extent of the site.
- SWSWA-DEV5 was discounted due to the elevated positioning and potential for the location to have overbearing visual impact for the residents in the area.
- SWSWA-DEV6 was discounted due to not being capable of accommodating an AIS substation and consenting risks due to the hydrological connectivity into the Nant y Rhos. The Site is crossed by a watercourse, limiting the developable area and is impacted by sloping topography in a north/south alignment and a north westerly alignment. Significant earthworks would be required to level the Site and culvert watercourses which would likely be resisted by the Local Planning Authority (LPA) and Lead Local Flood Authority (LLFA).





4.3 Longlist of options considered

Table 7: Longlist table

Option	Technical Description	Relevant Diagrams or Layout References	Consenting Risks & Environmental Impact	Rationale for rejecting or taking forward the option
Option A: Do minimum Not progressed	The network is kept in its current state, and no new connections are facilitated.	N/A	N/A	Engineering: Compliant customer connection not delivered.
Option B: Market-based solution Not progressed	Increased customer demand is accommodated through the procurement and use of ancillary services only.	N/A	N/A	Engineering: Compliant customer connection not delivered.
Option C: Non-transmission, whole systems solution Not progressed	The required customer connection is accommodated by a DNO instead of NGET.	N/A	N/A	Engineering: Compliant customer connection not delivered. Deliverability: The customer ██████ requested for a new GSP in the Hirwaun area which makes this option unviable. In addition, there are a total of ██████ contracted BESS customers with one having a Gate 2 offer. Combined, these customers represent ██████ making this option unfeasible.
Option D: Extension of the existing Rhigos 400 kV substation Not progressed	Extension of the existing Rhigos 400 kV substation.	N/A	N/A	Engineering: Extending Rhigos 400 kV was initially considered however it was found to be practically and economically unviable - with only one feasible extension direction (east) for two user bays. There was also an optioneering activity conducted to see if the ██████ required for ██████ could be accommodated at the site however, it was found that this would not be able to be accommodated due to extensive civil works, and section 106 agreement boundary.

				<p>There would be a high cost and risk associated with constrained layouts, limited circuits, and high generator infeed risk.</p> <p>The existing Rhigos 400 kV substation is currently also being extended to connect [REDACTED] onshore wind customers, which makes it near full capacity.</p> <p>Environment: During the ecological studies, it was identified that there are protected species in the area. In particular, the presence of sensitive peat bog habitat and a Section 106 agreement would restrict the extent of permissible development at the site, with any further expansion presenting increased environmental and planning risks.</p> <p>Deliverability: [REDACTED] new GSP requirement cannot be accommodated at Rhigos 400 kV due to significant engineering and environmental challenges explained above.</p>
<p>Option E-1: 400 kV AIS substation on Eastern side</p> <p>Taken forward to the shortlist</p>	<p>Construction of a new 400 kV double-busbar AIS substation within Development Area SWSWA-DEV4 (preferred site). [REDACTED]</p>	<p>SLD and layout is included in Section 4.4</p>	<ul style="list-style-type: none"> • Located outside statutory environmental designations. Primary consenting considerations relate to landscape and visual effects within the setting of the Brecon Beacons National Park and residential amenity. • Eastern siting minimises cut and fill, reduces impacts on southern woodland and avoids direct impacts on water features within the site. 	<p>Technology choice: The AIS option is a known design and there is nothing bespoke at present. This option also accommodates possible future connections due to design choice of a new double busbar.</p> <p>Environment: Reduced environmental impact – no GCN's recorded within 2km of site and no recorded presence of aquatic species within the site.</p> <p>Futureproofing: This option can be extended if required.</p> <p>Residential separation: The layout is furthest from the housing at Banwen to the west and is marginally further away from the housing on the A4109.</p>
<p>Option E-2: 400 kV AIS substation on Western side</p> <p>Taken forward to the shortlist</p>	<p>Construction of a new 400 kV double-busbar AIS substation design as Option E-1, with identical electrical capability and staging, but repositioned</p>	<p>SLD and layout is included in Section 4.4</p>	<ul style="list-style-type: none"> • Although within the same development area and outside statutory designations, the western layout 	<p>Technology choice: The AIS option is a known design and there is nothing bespoke at present. This option also accommodates possible future connections due to design choice of a new double busbar (enabling staged delivery).</p>

	<p>within the DEV4 site on the western side.</p>		<p>would require greater earthwork.</p> <ul style="list-style-type: none"> • Encroach closer to woodland and surface water features, and result in longer OHL entry requirements • increased interaction with southern habitats in pond 	<p>Land, planning and consent: Proximity to residential area presents challenges in consumer acceptance. Engineering: OHL entry arrangements are longer, increasing construction complexity. Futureproofing: Future extension is not possible due to A4109 to the north and forested hillside to the south of the layout.</p>
<p>Option E-3: 400 kV GIS substation</p> <p>Taken forward to the shortlist for cost comparison</p>	<p>Development of a 400 kV GIS substation providing equivalent electrical functionality to the AIS options, with enclosed equipment and reduced physical footprint. Considered as a contingent alternative should AIS consenting risks prove unacceptable.</p>	<p>SLD and layout is included in Section 4.4</p>	<ul style="list-style-type: none"> • Reduced land-take and visual impact, which may lower planning risk in constrained scenarios. 	<p>NGET Policy: Our policy is to adopt AIS technology for new or extended substations at sites designated as International Electrotechnical Commission (IEC) pollution class III or less, unless environmental, spatial and/or public visual amenity factors preclude the use of AIS.</p> <p>Rejected at this stage but retained as fallback and taken forward to the shortlist in this paper only for cost comparison purposes. GIS does not represent best value for consumers under current conditions but provides a risk-mitigation option should AIS planning or land acquisition risks become prohibitive. This approach maintains optionality without prejudicing PASE compliance.</p>

4.3.1 Influence of stakeholders on shortlisting

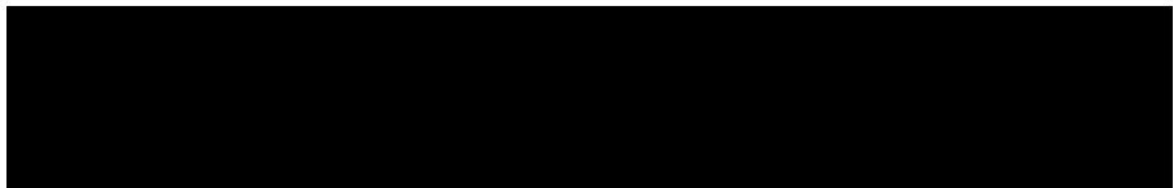
For Banwen, we have been regularly engaging with our customer, [REDACTED] through bi-weekly checkpoints, and they are on board with our optioneering i.e., our preferred solution. Section 4.7 explains our preferred solution and its rationale.

4.4 Shortlisted options

4.4.1 Option E-1: 400 kV AIS Substation with Eastern Position

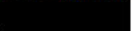
Option is a new-build 400 kV double busbar AIS substation, located within the preferred site – Development Area SWSWA-DEV4 – [REDACTED] on the eastern portion of the site to meet the drivers of new 400 kV customer connections and increased DNO demand. The option provides [REDACTED] at Stage 1, and sufficient space for future [REDACTED] transformers and generation bays in later stages, consistent with the system design requirements. The layout in Figure 9 is an indicative design [REDACTED]

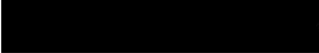
The eastern arrangement minimises cut and fill, allows shorter and more direct OHL entries, and provides improved separation from sensitive environmental features and residential receptors along the A4109. Consenting considerations are therefore dominated by landscape and visual effects within the setting of the Brecon Beacons National Park, which are considered manageable through embedded mitigation and layout optimisation.



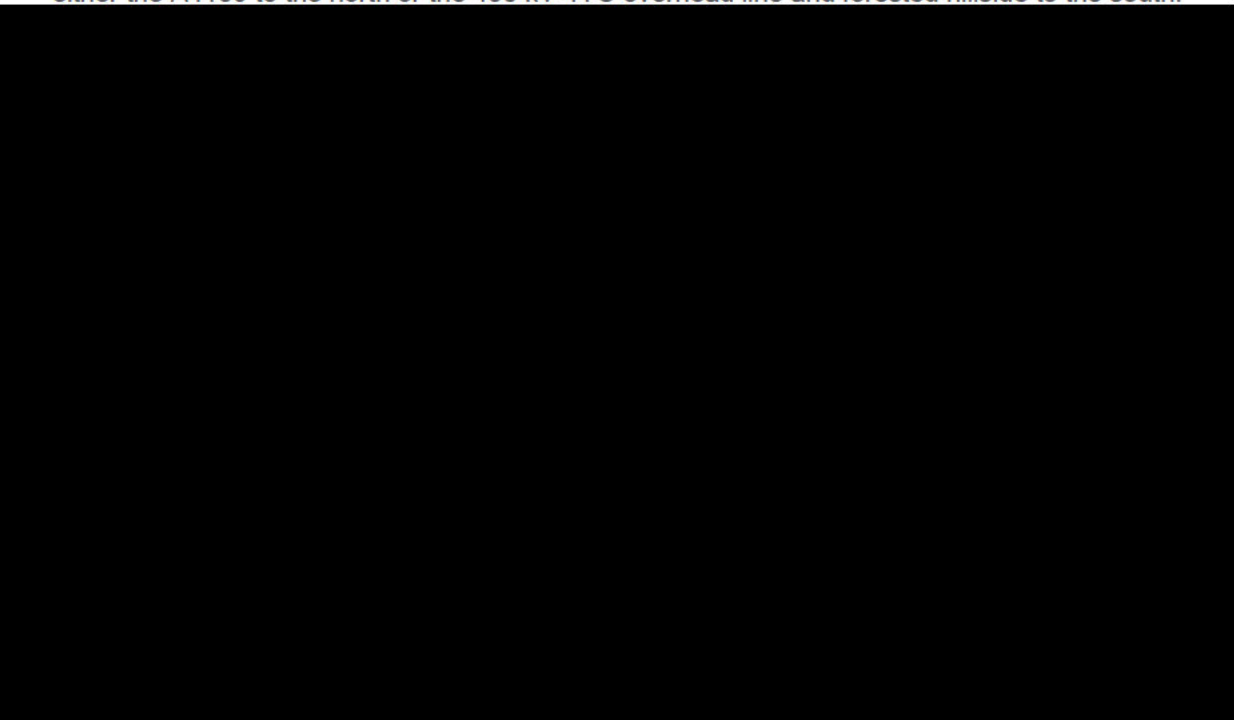


4.4.2 Option E-2: 400 kV AIS Substation with Western Position

Option E-2 has an alternative layout of the same 400 kV double-busbar AIS substation design as Option E-1, located within the western portion of Development Area SWSWA-DEV4. 



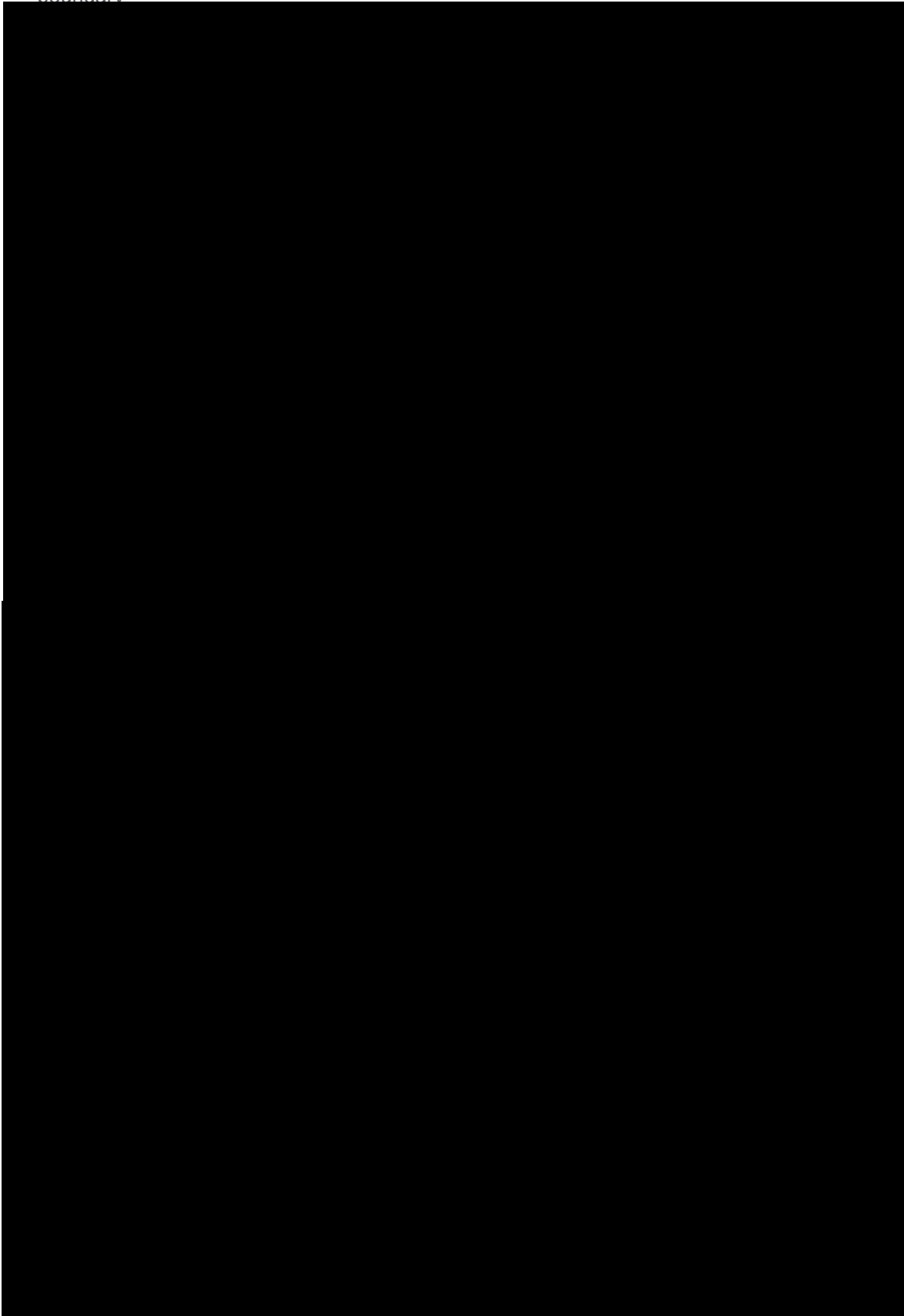
While technically feasible, the western layout is constrained by greater localised level variation, closer proximity to woodland and surface water features, and longer OHL entry requirements. These factors increase the extent of earthworks, construction complexity and interaction with environmental features when compared with the eastern arrangement, without providing any offsetting technical or system benefit. Futureproofing for this option is less feasible than Option E-1 because of space constraints. The north-south alignment of the 400 kV substation may limit future extension due to either the A4109 to the north or the 400 kV 4YU overhead line and forested hillside to the south.



4.4.3 Option E-3: 400 kV GIS Substation

Option E-3 is a compact GIS substation option located within the preferred site, providing equivalent initial system functionality to the AIS options but using GIS technology to reduce the physical footprint of the substation. The option was considered as a technology alternative rather than a

different site, with the GIS footprint assumed capable of being accommodated within the DEV4 boundary



4.5 Detailed qualitative analysis of shortlisted options

Table 8: Detailed Qualitative Assessment Table

Optioneering Categories					
Option	Engineering	Environmental	Deliverability	Economic/Consumer Value	Consenting /Stakeholder
Option E-1 AIS Eastern	<ul style="list-style-type: none"> ✓ Meets network requirements for a new South Wales West Connection Node, supporting [REDACTED] GSP demand and future generation connections. ✓ Double-busbar 400 kV AIS design with double-circuit OHL turn-ins; compliant with NETS SQSS requirements for fault level, voltage stability and system operability. ✓ Eastern layout minimises boundary constraints, shortens OHL entry lengths and improves constructability. ✓ Provides high operational flexibility, maintainability and long design life, with proven technology and minimal vendor reliance. 	<ul style="list-style-type: none"> ✓ Located outside statutory environmental designations; environmental considerations relate primarily to landscape and visual effects within the setting of the Brecon Beacons National Park. ✓ Eastern layout reduces interaction with woodland and surface water features compared to the western arrangement, minimising construction disturbance. ✓ Whole-life carbon impacts considered acceptable relative to alternatives, with decarbonisation benefits driven by enabling low-carbon generation and storage connections. 	<ul style="list-style-type: none"> ✓ Supports the earliest in-service date, 2031, due to reduced earthworks, simpler access and shorter OHL interfaces. ✓ Lower construction and system access risk compared to Option E-2. ✓ Delivery risks are well understood and considered manageable, with no requirement for complex technical deviations. 	<ul style="list-style-type: none"> ✓ Enables timely connection of [REDACTED] demand by 2031, supporting regional economic growth, inward investment and jobs. ✓ Allows future expandability, allowing additional SGTs and generation bays within the preferred site, delivering strong future value and whole-system benefit if later customer need materialises. ✓ Lowest capex option. 	<ul style="list-style-type: none"> ✓ Planning risks primarily relate to landscape, visual impact and residential amenity, all considered mitigable through layout optimisation and landscaping. ✓ Land availability confirmed within the preferred site, with sufficient space for current and future requirements. ✓ Eastern layout maximises separation from sensitive receptors, improving community acceptance. * While this option has a strong likelihood of achieving planning permission, there are consenting risks associated with the selected site due proximity to a national park and due to the size of AIS substation for the Local Planning Authority.
	Strong Benefit	Benefit	Benefit	Benefit	Neutral
Option E-2 AIS Western	<ul style="list-style-type: none"> ✓ Electrically identical to Option E-1 and fully capable of meeting network 	<ul style="list-style-type: none"> ✓ Same baseline environmental context as 	<ul style="list-style-type: none"> * Longer and more complex construction sequence compared to Option E-1. 	<ul style="list-style-type: none"> * Higher cost escalation risk due to increased earthworks and mitigation requirements. 	<ul style="list-style-type: none"> * Consenting risks of similar nature to Option E-1 but heightened by closer

	<p>requirements and NETS SQSS compliance.</p> <ul style="list-style-type: none"> * Western layout within DEV4 introduces greater boundary constraints, increased cut and fill and longer OHL entry requirements. * Higher constructability risk due to proximity to woodland, surface water features and areas of greater local level variation. ✓ Similar system operability, and resilience benefits as Option E-1. 	<p>Option E-1 due to shared land parcel.</p> <ul style="list-style-type: none"> * Western arrangement increases interaction with woodland and surface water features, resulting in greater construction disturbance. * Increased landscape and visual effects due to layout orientation and additional earthworks. • No decarbonisation or biodiversity benefit relative to Option E-1. 	<ul style="list-style-type: none"> * Increased delivery risk driven by earthworks, access complexity and environmental constraints. * Greater risk to programme certainty with no improvement to in-service date. 	<ul style="list-style-type: none"> ✓ Similar benefits related to system performance, confirming future value or consumer benefit. * Futureproofing is challenging on the western layout due to roads and vegetation. 	<p>proximity to environmental features and increased landscape effects.</p> <ul style="list-style-type: none"> * Reduced community acceptance potential due to increased visible impact and construction effects. * Inferior consenting performance within the same site boundary. * Multiple landowners resulting in more complex acquisition requirements.
	Benefit	Neutral	Detractor	Neutral	Detractor
Option E-3 GIS	<ul style="list-style-type: none"> ✓ Technically capable of meeting initial network requirements within DEV4. 	<ul style="list-style-type: none"> ✓ Smaller physical footprint but OHL interfaces and landscape context remain unchanged. 	<ul style="list-style-type: none"> * Longer installation times compared to AIS. 	<ul style="list-style-type: none"> * Lower cost escalation risk, although higher capex than Options E-1 and E-2 as per quantitative analysis below. ✓ Future expansion is possible by adding more bays. 	<ul style="list-style-type: none"> ✓ Due a relatively smaller footprint, Option E-3 could have an advantage over AIS for achieving consents from the Local Planning Authority.
	Neutral	Neutral	Detractor	Neutral	Benefit

4.5.1 Summary

Based on the qualitative assessment, Option E-1 emerges as the preferred option as it provides the most balanced solution across constructability, environmental impact, future expandability and delivery risk, while meeting the system and customer connection drivers.

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, we have applied a [REDACTED] contingency, based on historic project analysis, to account for unforeseen circumstances and mitigate risks during implementation. As noted in Section 4.3, we have only mentioned GIS in this section for cost comparison purposes.

Options E-1 and E-2 include Stage 1 costs and enabling works for Stage 2. [REDACTED]
[REDACTED] Options E-1 and E-2 represent the current cost-book estimates for the Stage 1 works and enabling works required to preserve future expandability.

Option E-1 is lower cost than Option E-2 because of higher OHL and cables cost. Option E-2 consists of slightly greater quantities of OHL due to its layout and route.

Option E-3 has a higher cost because it's not split up by staged delivery.

The final project scope and costings will be subject to confirmation of site-specific security requirements.

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:

- Super grid transformers (SGTs)
- SGT cables

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:

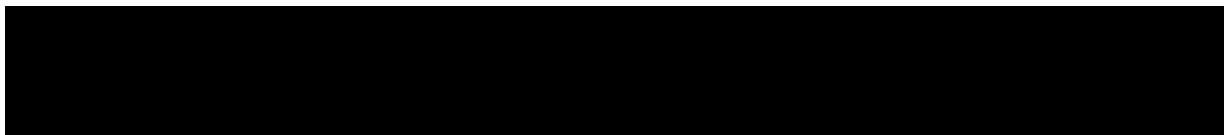
- (i) Initial CAPEX investment required
- (ii) Future end of life replacement costs

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

- Option E-1: 400 kV AIS substation (East)
- Option E-2: 400 kV AIS substation (West)
- Option E-3: 400 kV GIS substation

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.



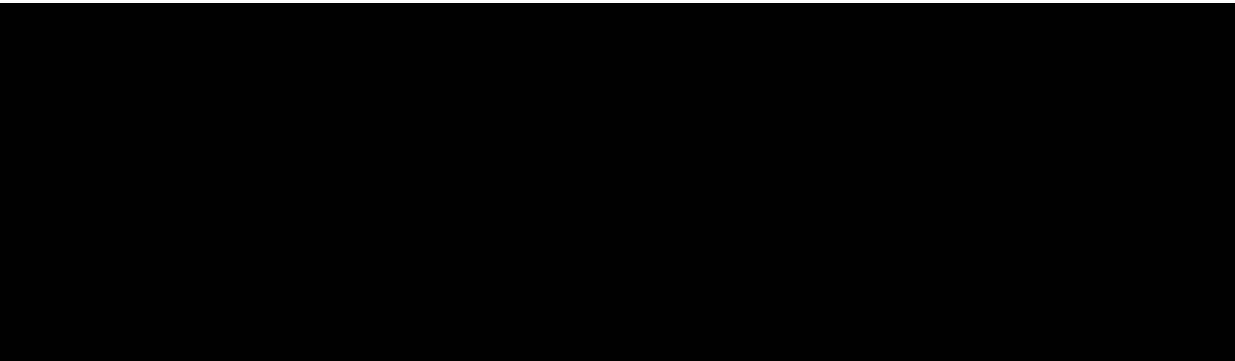
On the basis of the discounted lifetime CBA results (Table 10), **Option E-1** delivers the highest NPV () and therefore represents the preferred option on consumer value grounds. Options E-2 and E-3 also deliver negative NPVs however they are lower than E-1 (). This analysis is subject to confirmation 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

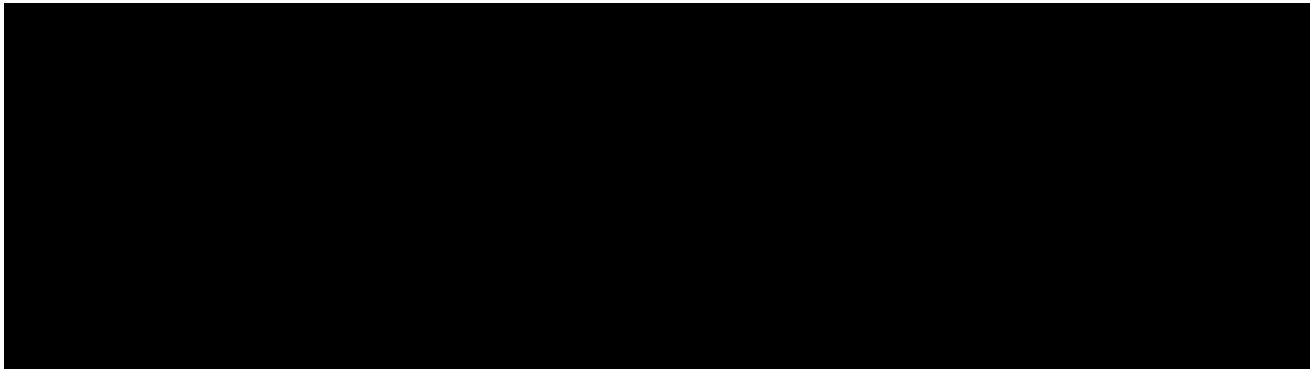


4.6.2.5 Benefits

The following benefits have been included within the CBA:

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

Table 12 presents the summary of all (undiscounted) benefits, including environmental and non-environmental benefits, considering the central base case carbon price.



The transmission loss is higher for Option E-3 because it includes 4 SGTs (not split using the Staged delivery approach as done for Options E-1 and E-2), and provision for Reactive compensation. The gas leakage costs are higher for Options E-1 and E-2 because they have SF6 components whereas Option E-3 is SF6 free.

4.7 Preferred solution

Based on the detailed analysis in Sections 4.5 and 4.6, the preferred solution is Option E-1: New 400 kV AIS double busbar substation on the eastern side of the preferred site. The preferred option establishes a new 400 kV double-busbar AIS substation with double-circuit turn-ins, strengthening transmission capability and creating a strategic South Wales network node, in a region that is a designated AI-Growth Zone and is experiencing increased connection demand.

A new build substation has been selected as the existing Rhigos 400 kV substation cannot accommodate [REDACTED] GSP requirement due to reasons explained in Table 7, Section 4.3. Among the shortlisted options, Option E-1 is the lowest-cost or highest Net Present Value option, and the qualitative assessment provides us with material engineering and consenting advantages over Option E-2, that would result in meeting the delivery timeline of [REDACTED].

Option E-1 has shorter and more direct OHL entries, lower earthworks requirements, and reduced interaction with woodland and surface water features compared with Option E-2. Furthermore, Option E-1 has a relatively lower consenting risk within the preferred site because the layout has less interaction with sensitive receptors, has relatively easier land acquisition and strongest likelihood of achieving planning permission. These factors support a more practical construction solution and lower the delivery risk which is a critical factor in ensuring that we meet the customer's delivery expectations.

4.7.1 Project benefits, outputs & deliverables

The proposed investment at Banwen will deliver several benefits to the network, stakeholders and consumers. A summary of the indicative output for the developing investment and foreseen benefits is summarised in Table 13 below.

Table 13: Summary of Outputs and Benefits

Output & Proposed PCD	Construction of a new double busbar, double circuit turn in 400 kV AIS substation in the Hirwaun area by 2031 during Stage 1, to connect [REDACTED] GSP for [REDACTED] and [REDACTED] of BESS demand.
	<ul style="list-style-type: none">• Establishes a new 400 kV double-busbar AIS substation with double-circuit turn-ins, strengthening transmission capability and creating a strategic South Wales network node.• Alleviates existing South Wales corridor constraints, improving system resilience, outage flexibility, and long-term operability.• Facilitates local demand by improving the transmission interface with the [REDACTED] distribution network.• Located away from built-up areas, causing less disturbance for residents. Does not disturb endangered or protected species, providing an ecological benefit.• Unlocks major storage and renewable projects, supporting regional economic activity, low-carbon growth and job creation in South Wales• Reduces the risk of delay-related system costs by enabling the timely connection of contracted demand and generation customers.• Supports future local development and inward investment by increasing network capacity and reducing the risk of electricity constraint.• Includes digital P&C equipment for better maintenance and digitalization of the substation. Set to be the first Digital substation in the country leading in the futureproofing of the network.

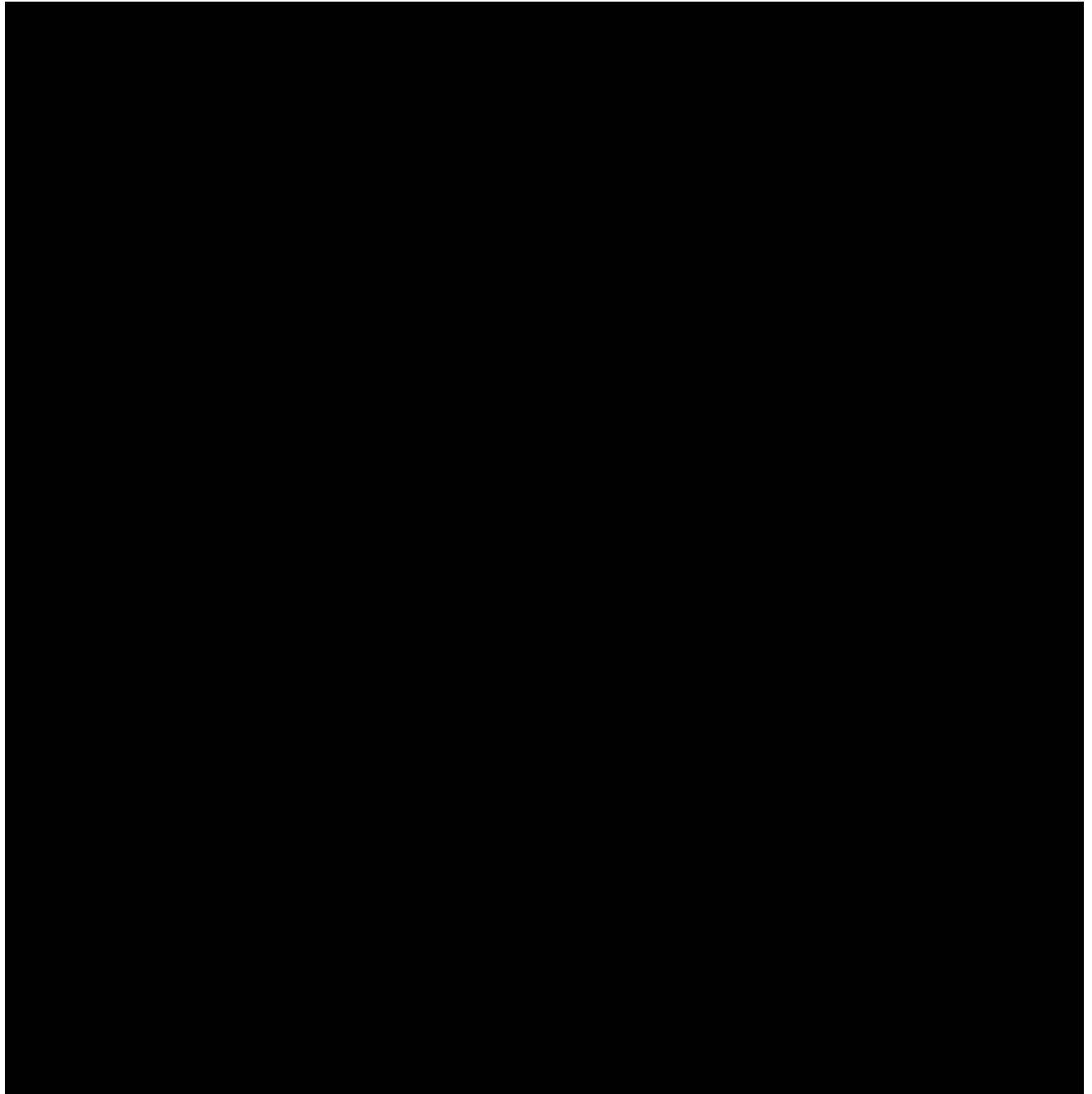
4.7.2 Futureproofing

The new 400 kV AIS double busbar substation can accommodate multiple new customers – currently there are eight contracted customers, and the project will be completed in a staged delivery phase. The position of the substation on the eastern side of the preferred layout was considered as it provides us with the flexibility to expand the substation in future, considering the significant growth in connections demand in the South Wales region. In addition, as stated in Section 1.4, the design of the substation preserves optionality for customers that currently hold Gate 1 offers.

5. Project Delivery

5.1 Proposed deliverability programme

The indicative timeline for this investment is detailed in Table 14 below.



5.2 Procurement & contracting strategy

The proposed procurement is for Banwen to be delivered via the newly instigated Electricity Transmission Partnership (ETP), which was launched in September 2025. ETP establishes a partnering approach to allocation of substation construction projects to our supply chain contractors to ensure that we continue to deliver value for consumers. This will take advantage of utilising regional allocation where it is mutually beneficial to further enhance growth and social value.

We will award the full scope of work to Murphys, who have been allocated as the enterprise partner for the southeast region. They will be contracted to do the 4.4 detailed design which will be completed in 2026 and awarded a staged ECI contract to support and liaise with sub-contractors.

5.3 Risk & risk management

A risk management process has been used for managing reasonably foreseeable risks. Table 16, below, lists the key risks identified for the project and our approach for mitigating them.

Table 16: Risk Summary Table

Risk	Mitigation
Historic Coal Mining field identified at substation site.	GI surveys to be carried out during development stage of project to determine the extent of contamination
Murphys, the regional partners, may not have the capacity to carry out ECI works	If Murphys are unable to tender for works, it will be open to National partners to tender.
Long lead times for SGTs	We will order SGTs with enough time considering the 24-36 lead times.

Additional risks identified since this risk register include:

- **Consenting risks:** There are consenting risks associated with the selected site due to proximity to a national park and due to the size of AIS substation for the Local Planning Authority, this may result in redesign for a GIS substation. To mitigate this there will be early engagement with the local planning authority and preplanning consultation events to advise planning application.
- **Connections Reform:** There is a risk to the customers due to Connections Reform. A number of contracted customers have Gate 1 offers, if / when these are progressed to more detail this may expand the scope required in the near term. As a result, there is a risk of programme development delay.

6. Proposed working arrangements

6.1 Details of proposed working arrangements between TOs

Not applicable.

6.2 Details of proposed working arrangements between DNOs

We are engaging with NGED on interfaces relevant to the development of Banwen. In particular, third-party works will be required to re-route an existing NGED 132kV OHL that crosses the field, and these will need to be diverted before the build of the new substation. In addition to this, there have been discussions around land and consents for the co-location of the substation with [REDACTED] and it has been agreed that both of us will consent and purchase the land separately.

7. Conclusion

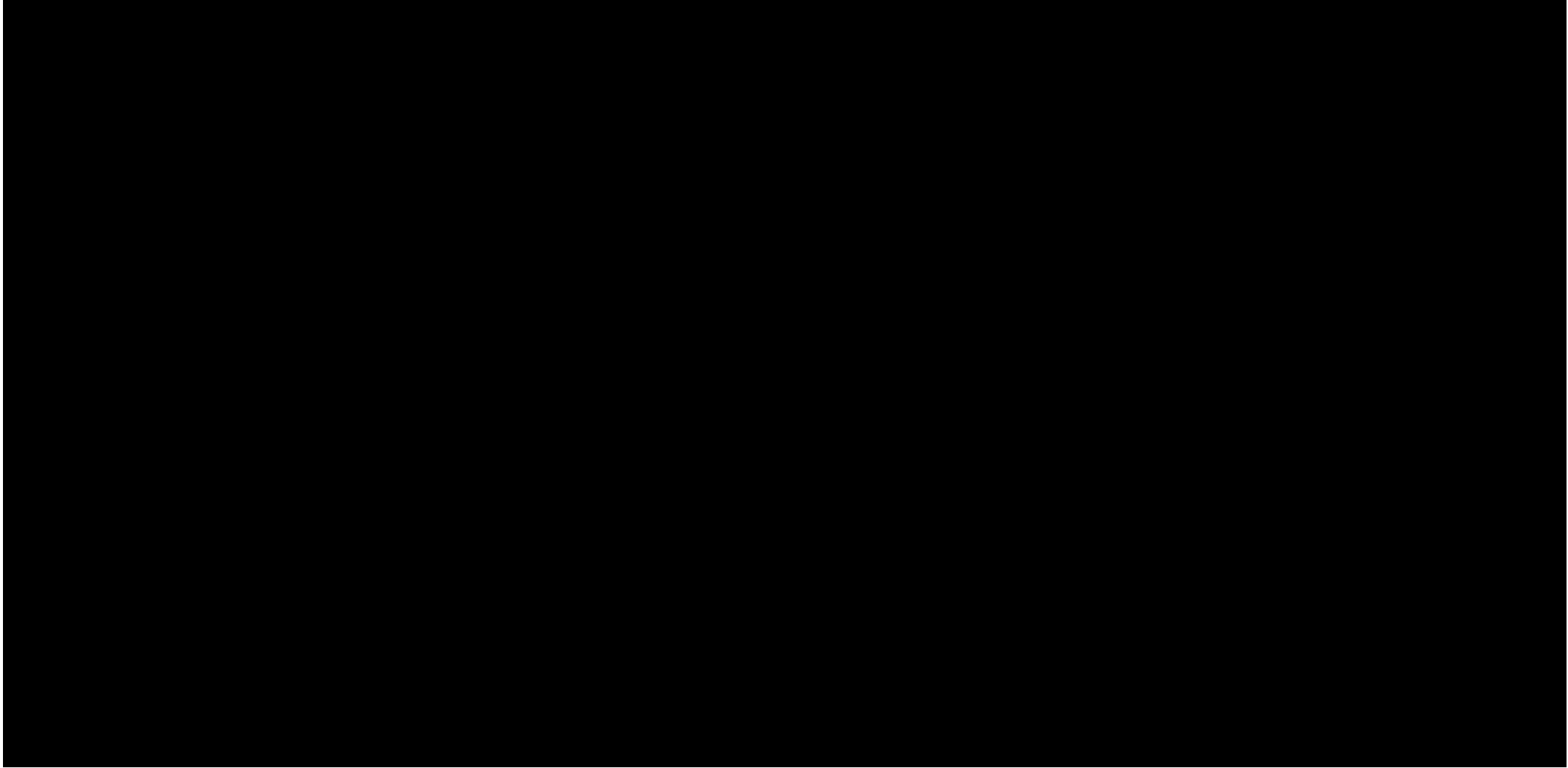
This submission outlines a preferred solution to satisfy the investment drivers. It seeks confirmation of eligibility under Special Condition 3.18, confirmation of eligibility for PCF under Special Condition 3.15, confirmation of re-opener Track 2 EL and formal approval of the eligibility and preferred solution.

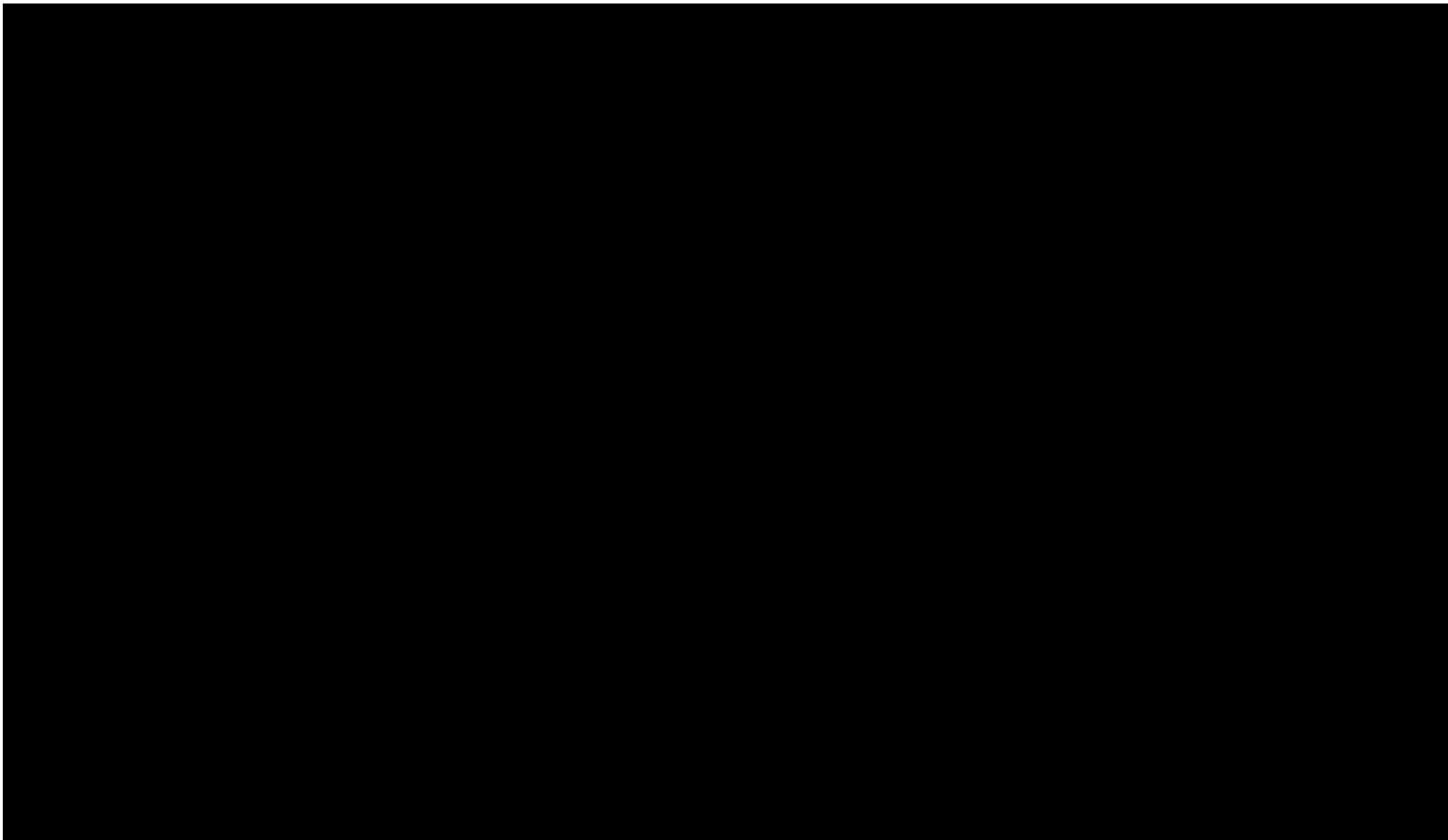
The preferred Option E-1 comprises of a new build Double Busbar 400 kV AIS substation on the eastern side of the preferred site.

Table 17: Investment summary

Main Drivers	<ul style="list-style-type: none"> • [REDACTED] requirement for a new [REDACTED] Grid Supply Point (GSP) in the Hirwaun area by 2031. • A [REDACTED] MW Battery Energy Storage System (BESS) customer with a Gate 2 offer [REDACTED]
Preferred Options	Option E-1: A new-build 400 kV double-busbar AIS substation, located within the preferred site – Development Area SWSWA-DEV4
Estimated Cost & Timing	<p>Total forecasted expenditure: [REDACTED]</p> <p>Indicative delivery timeline: [REDACTED]</p>
Outputs	Delivery of a new 400 kV double busbar AIS substation, to enable [REDACTED] connection – GSP – for [REDACTED] by 2031 (Stage 1), and to connect a [REDACTED]

8. Appendices





8.2 Appendix B – NGET’s position on Common Land

Common land in Wales presents a significant consenting and programme risk for nationally significant electricity transmission projects where it is required to be compulsorily acquired outside the Planning Act 2008 regime.

Where a Compulsory Purchase Order includes common land, the Acquisition of Land Act 1981 requires the acquiring authority to either secure a specific certificate from the Welsh Ministers or proceed through Special Senedd Procedure, unless narrow statutory exceptions apply. Special Senedd Procedure is particularly onerous and common land is protected. NGET have an environmental duty and compulsory acquisition of common land has the potential to introduce multi-year delays to project delivery and consenting uncertainty, creating a material risk to strategic customer connection dates.

The statutory exceptions to avoid Special Senedd Procedure are limited and highly constrained. They require either the provision of suitable and proximate exchange land of equal advantage, land take below a very de-minimis threshold, or acquisition for the purposes of preservation or improved management of the land. In practice, identifying suitable exchange land that meets Welsh Government guidance and public interest tests is often challenging, and where required, certificate applications and any associated inquiry processes carry inherent uncertainty and delay risk.

In addition, deregistration of common land under the Commons Act 2006 is generally not always achievable, where NGET does not already control both the release land and the replacement land, further constraining delivery options.

Given these requirements, NGET’s position is to assess the risk, harm and mitigation considering our environmental licence duties and deregistration requirements to the common land wherever reasonably practicable, particularly for projects driven by firm customer demand and defined delivery milestones. Limiting the amount of development in common land (which has statutory protection) reduces harm and consenting complexity, limits exposure to Special Senedd Procedure, and provides greater confidence in programme certainty and deliverability.

Where interaction with common land cannot be avoided, this would need to be identified at the earliest possible stage, with parallel consideration of certification requirements and programme impacts. However, such scenarios are recognised as high risk and materially less attractive than non-common-land alternatives.

8.3 Glossary

Table 19: 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

Abbreviation	Description
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
kW	Kilo Watt
LLTI	Long Lead Time Items
LTDS	Long-Term Development Statement
LV	Low Voltage

Abbreviation	Description
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
tCOE6	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

Abbreviation	Description
UKPNS	UK Power Networks Services
UXO	Unexploded Ordnance
VCA	Voltage Compliance Assessment
XPLE	Cross-Linked Polythene

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