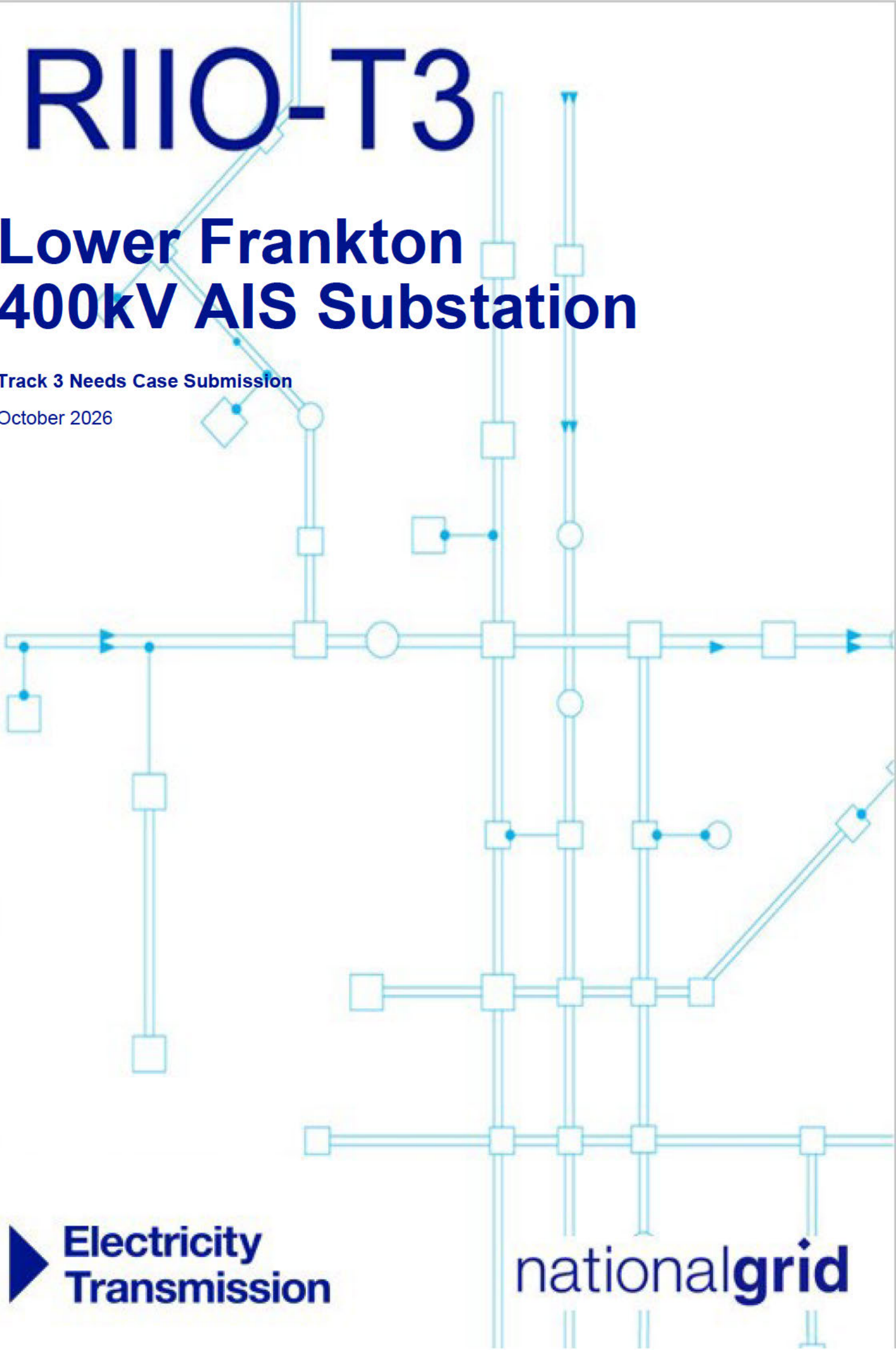
RIIO-T3

Lower Frankton 400kV AIS Substation

Track 3 Needs Case Submission

October 2026



Electricity Transmission

nationalgrid

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Reference and summary table

Field	Description
Project name	Lower Frankton 400kV
TO's preferred re-opener track	Track 3 Needs Case (NC)
RRP references	NGT500040 (400kV new substation) NGT500041 (132kV new substation)
BPDT / Scheme reference number	Not Applicable
Load Board reference	NGT500040

Investment driver(s)	**Primary Driver**
	• Connection of contracted Independent Distribution Network Operator (IDNO) 132kV substation for [redacted] and their five associated Bilateral Embedded Generation Agreement (BEGA) connections with Gate 2 offers – providing a combined Transmission Entry Capacity (TEC) of 693MW for onshore wind generation.
	Wider Drivers
	• The North–South Wales reinforcement (PSNC) first set out in Pathway to 2030 has been further developed in the Transitional Central Strategic Network Project 2 (tCSNP2) Refresh. It has been refined into two coordinated projects:
	  ◦ Upper Wales New Circuit (UWNC) – a new double circuit from North Wales to Shropshire
	  ◦ Mid Wales New Circuit (MWNC/MWN1) – a new 400kV circuit between West Midlands and Southwest England
	• This option incorporates the tCSNP2 Refresh requirement for power flow control through the installation of [redacted]2750 MVA Quad Boosters (QBs) at Lower Frankton, providing the capability needed to manage increased regional power flows and network constraints.

Project Outputs	• Construction of a new [redacted] bay 400kV AIS substation and 132kV at the standard connection boundary, with busbar infrastructure installed across all bays to facilitate future customer connections. • The IDNO will construct and own the 132kV substation.

Field	Description
	• Provision of [redacted] 400/132kV 460MVA super grid transformers (SGTs) and associated bays for IDNO customer connections. • Integration of overhead line (OHL) double turn-in, [redacted] sections, associated section breakers, and [redacted] bus couplers.
Short list of strategic options considered	Two main options were shortlisted for detailed analysis: • **Option E-2:** A new 400/132 kV AIS substation with [redacted] bays. • **Option E-3:** A new 400/132 kV AIS substation with [redacted] bays.
Preferred solution and explanatory narrative on the rationale	Following siting re-assessment, the preferred option remains Option E-3: new [redacted] bay 400kV double busbar AIS substation at Lower Frankton. This option was selected because it meets all current drivers while also accommodating greater future requirements, most notably the NESO-driven UWMC and MWNC/1 connections and flow control assets, without the later extension works which would be required under Option E-2. Although E-3 has a slightly larger upfront footprint, it aligns with "build it once" principles, reducing delivery risk by avoiding repeat mobilisation, reducing additional outages/system access constraints, and further local disruption.
PASE alignment	The current design is a PASE primary option – New build, 400kV Double Busbar Air-Insulated Switchgear (AIS) substation.
Costs (23/24 prices)	The total project cost for E-3, including contingency, is [redacted] at the 2023/24 price base. The expenditure has been assessed through a comparative option appraisal and represents the most efficient whole-life solution for meeting the contracted connection requirements while providing cost-effective capability for anticipated future network needs. Although lower-cost options were identified, these would require subsequent site expansion, resulting in additional construction costs, repeat outages, increased delivery risk, and greater disruption to stakeholders. The preferred option therefore minimises whole-life expenditure and supports efficient network development.
Delivery year	Phase 1: [redacted] (IDNO Connection) Phase 2: [redacted] (potential future UWNC and MWNC/MWN1 Connections)
Applicable reporting tables	E1.11 Pipeline Log - OSR NGT500040, NGT500041
Interactive projects	Ironbridge-Legacy-Shrewsbury and Ironbridge-Legacy Overhead Line (OHL) reconductoring schemes (formerly

Field	Description		
	named Deeside) and UWNC / MWNC/1 strategic reinforcements (formerly PSNC).		
Historic funding interactions	We have not received any historic funding for the investment. There are no early asset write-offs (EAWOs) associated with this project.		
Spend apportionment	**T2 (FY 2022-2026)**	**T3 (FY 2027-2031)**	**T4+ (FY 2032- 2037+)**
	[redacted]	[redacted]	[redacted]

Executive summary

Project summary

Lower Frankton 400kV will deliver a new [redacted] bay 400kV AIS substation at Lower Frankton, Shropshire, positioned on the existing OHL corridor between Legacy, Ironbridge, and Shrewsbury. The project is driven by the need to facilitate [redacted] contracted connection requirements. [redacted] IDNO network will connect seven BEGA energy parks, five of which have Gate 2 connection offers. The investment also provides sufficient flexibility to accommodate potential future network requirements identified through strategic network planning and Connection Reform processes. The substation will provide [redacted] 460 MVA super grid transformers, space to accommodate spare bays for potential future generation connections and enhanced operational flexibility through section breakers and bus couplers.

Submission purpose

We seek Ofgem's approval of the optioneering we have conducted and the preferred solution we have selected, under the Load Related Re-Opener and Price Control Deliverable in Special Condition 3.18.

Project need

Lower Frankton is a load-driven investment required to facilitate the connection of the [redacted] 132kV IDNO substation and its associated seven BEGA-backed onshore wind connections, with a combined total Transmission Entry Capacity (TEC) of 943MW. Five of the IDNO-associated customers hold Gate 2 Phase 2 offers (with 693 MW combined TEC) and represent the primary customer-driven need for the investment. The project is also driven by wider network requirements, including the need to accommodate the NESO-signalled strategic North-South Wales reinforcement works, and to address emerging system operability and power flow management need identified through network planning.

Optioneering to date

We have undertaken a multi-factor optioneering process to identify the most efficient solution to meet the identified needs. We conducted a high-level assessment of strategic options (do nothing, market-based, whole-system, reuse or extension of existing assets, and new-build) to develop a longlist of potential options shown in Table 1. In identifying a shortlist of options for this site, we have considered:

- Ability to provide customer with required connection.
- Extension/utilisation of an existing site versus newbuild.
- Ability to facilitate additional future connections and strategic drivers.

Lower Frankton was initially identified to facilitate the [redacted] IDNO connection. However, the scheme has since evolved into a multi-driver investment, reflecting increased customer demand, additional generation interest, and the identification of Lower Frankton as a strategic connection node for wider North-South Wales network reinforcement. This coordinated

approach enables multiple network requirements to be delivered through a single transmission investment, providing an efficient outcome for consumers.

In response to these additional strategic drivers, we revisited the siting assessment to confirm the continued suitability of the preferred location. The re-assessment, including consideration of additional shortlisted sites, confirmed that Option E-3 [redacted] 400kV AIS substation) remains the preferred solution when assessed against constructability, system integration, environmental constraints and stakeholder impacts. Whilst Option E-2 delivers the most favourable NPV under the base case assessment, we have selected Option E-3 as it provides greater flexibility to accommodate future network requirements and delivers the best long-term value for consumers.

The referenced layouts/Single Line Diagrams (SLDs) can be found in Section 3.

Table 1: Summary of Options

Option	Details	Drivers met?	New site?	AIS/ GIS?	Shortlist?	Preferred solution?
Option A	Do nothing counterfactual option The network is kept in its current state, and no new connections are facilitated.	No	No	N/A	No	No
Option B	Market-based solution Increased customer demand is accommodated through the procurement and use of ancillary services only.	No	No	N/A	No	No
Option C	Non-transmission, whole systems solutions The required customer connection is accommodated by a DNO instead of NGET.	No	No	N/A	No	No
Option D-1	Connection to Legacy Substation Works within existing operational substation boundary reduce consenting risk. Potential land and access constraints.	No	No	AIS	No	No
Option D-2	Connection to Ironbridge Substation Works within existing operational substation boundary reduce consenting risk. Potential land and access constraints within constrained substation footprint.	No	No	AIS	No	No
Option D-3	Connection to Shrewsbury Substation Works within existing operational substation boundary reduce consenting risk. Potential land and	No	No	AIS	No	No

Option	Details	Drivers met?	New site?	AIS/ GIS?	Shortlist?	Preferred solution?
	access constraints within constrained substation footprint.					
Option E-1	[redacted] bay, 400kV AIS substation Provision of a grid connection for [redacted] only, without full substation bay build out. The Substation would be 5000A continuous rated, 63kA fault level capability, comprise of [redacted] sections, sections breakers, [redacted] 460MVA SGTs and [redacted] bus coupler.	Yes, partially – would connect [redacted].	Yes	AIS	No	No
Option E-2	[redacted] bay, 400kV AIS substation New build [redacted] bay substation providing sufficient firm capacity for forecast growth. The Substation would be 5000A continuous rated, 63kA fault level capability, comprise of [redacted] sections, sections breakers, [redacted] 460MVA SGTs, [redacted] bus couplers and [redacted] spare bays.	Yes, partially. Current drivers met, limited future flexibility.	Yes	AIS	Yes	No
Option E-3	[redacted] bay, 400kV AIS substation Larger new build [redacted] bay substation providing maximum future capacity and operational flexibility. The Substation would be 5kA continuous rated, 63kA fault level capability, comprise of [redacted] sections, sections breakers, [redacted] 460MVA SGTs, [redacted] bus couplers and an increase to [redacted] spare bays.	Yes	Yes	AIS	Yes	Yes

Cost estimates

The preferred option (Option E-3) has an estimated total cost of [redacted] (23/24 price base), including risk and contingency. This early-stage estimate has been developed using internal cost benchmarks derived from comparable projects and has not yet been validated through market testing.

Final costs will be confirmed through the Project Assessment stage.

Indicative delivery programme

Customer connection milestones remain subject to ongoing Connections Reform processes. However, we anticipate a target energisation of the preferred option, E-3, in [redacted]

Key dependencies are planning consent, [redacted] land acquisition for the identified parcel near Lower Frankton, procurement of a main works contractor and regulatory approval. Procurement of long-lead equipment and coordination of outages are also required, with system access

constraints from concurrent ASTI schemes crossing the same boundary, such as North Humber–High Marham and Grimsby-Walpole new OHL circuits. This can result in potentially restricting outage windows and requiring careful scheduling.

The programme is realistic but subject to these dependencies. The delivery schedule will be further developed and confirmed at Project Assessment, with timings refined as land, planning, and outage arrangements progress.

1. Introduction

1.1 Lower Frankton 400kV Substation

This document is our Needs Case submission under the Load Re-opener and Price Control Deliverable in Special Condition 3.18 for the Lower Frankton 400kV substation scheme.

Through it, we seek approval of the investment need, optioneering and our preferred option.

If Ofgem confirms the needs case and optioneering, we will continue development and submit a Project Assessment in line with the re-opener process.

Eligibility, Project Track Statement and PASE

The Lower Frankton Eligibility Letter (EL) was submitted to Ofgem in May 2026. Whilst a formal decision on eligibility is pending at the time of this Needs Case submission, Draft Determinations indicate Ofgem are minded to approve the project's eligibility.

The project is being submitted through the Track 3 Load Re-Opener pathway.

This project is a PASE primary option consisting of a 400kV double busbar AIS substation. Further detail is provided in the PASE alignment section.

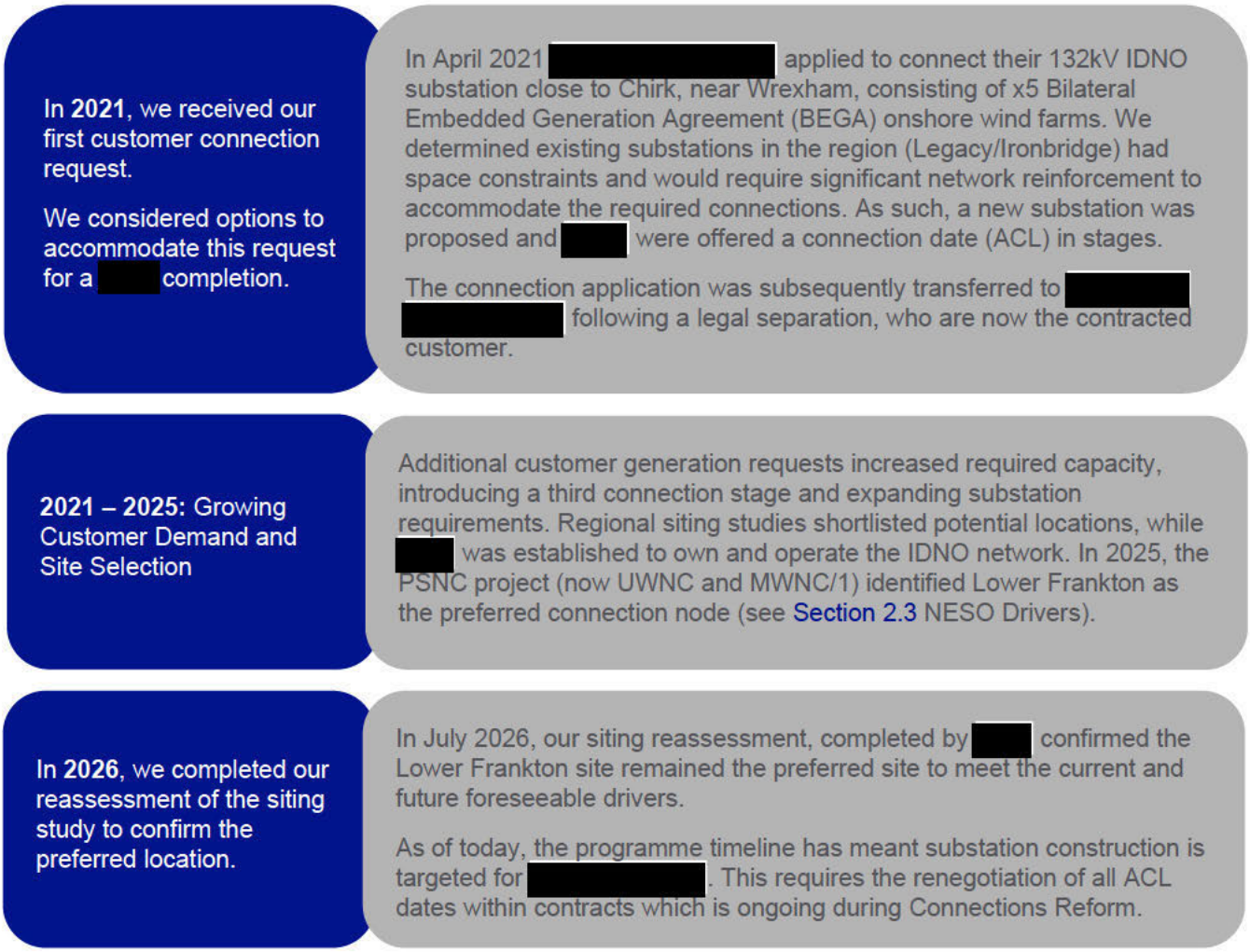
1.2 Background

Chronology of investment

The Lower Frankton investment originated from the need to establish a new 400 kV node in the region to facilitate customer connections, but has subsequently evolved into a portfolio-optimised investment addressing multiple network drivers. As network requirements have developed over time, the scale and functional requirements of the scheme have materially expanded beyond those considered in the original siting assessment. In response, we have revisited the siting work against the updated scope, drivers, constraints and delivery considerations, confirming that the preferred site remains appropriate for accommodating the revised investment requirements.

The chronology of the investment, its evolving drivers and the associated optioneering considerations are summarised in Figure 1.

Figure 1: Summary of chronology



Regional and network context

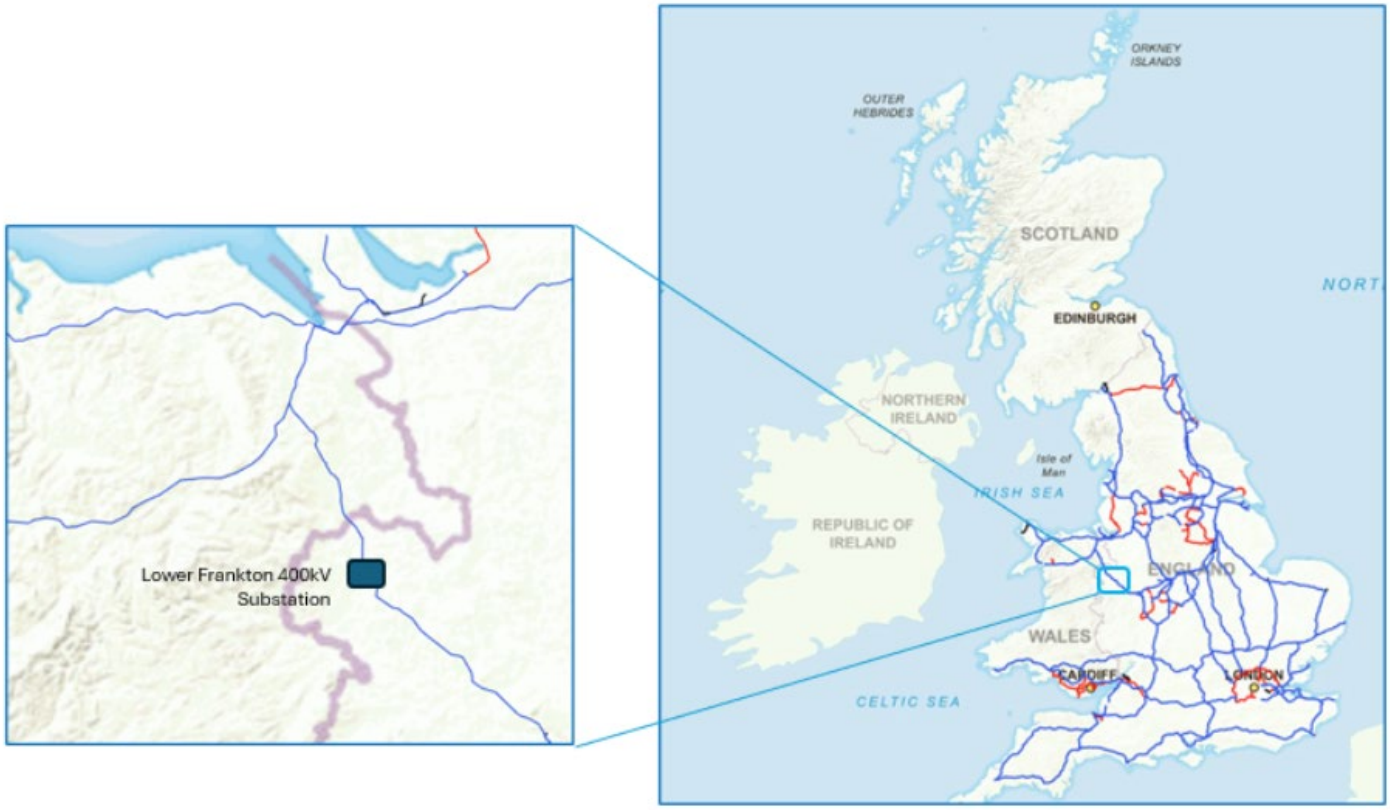
The regional context is characterised by significant renewable generation growth and multiple customer connection requirements across mid Wales, driving the need for additional transmission infrastructure. The existing 400 kV Legacy–Ironbridge–Shrewsbury corridor (ZZK) is a key route for power transfers between generation-rich areas of North Wales, the Midlands and wider GB transmission network, with regional power flows further influenced by the Western Link interconnector and increasing electrification-driven demand shown in Figure 2.

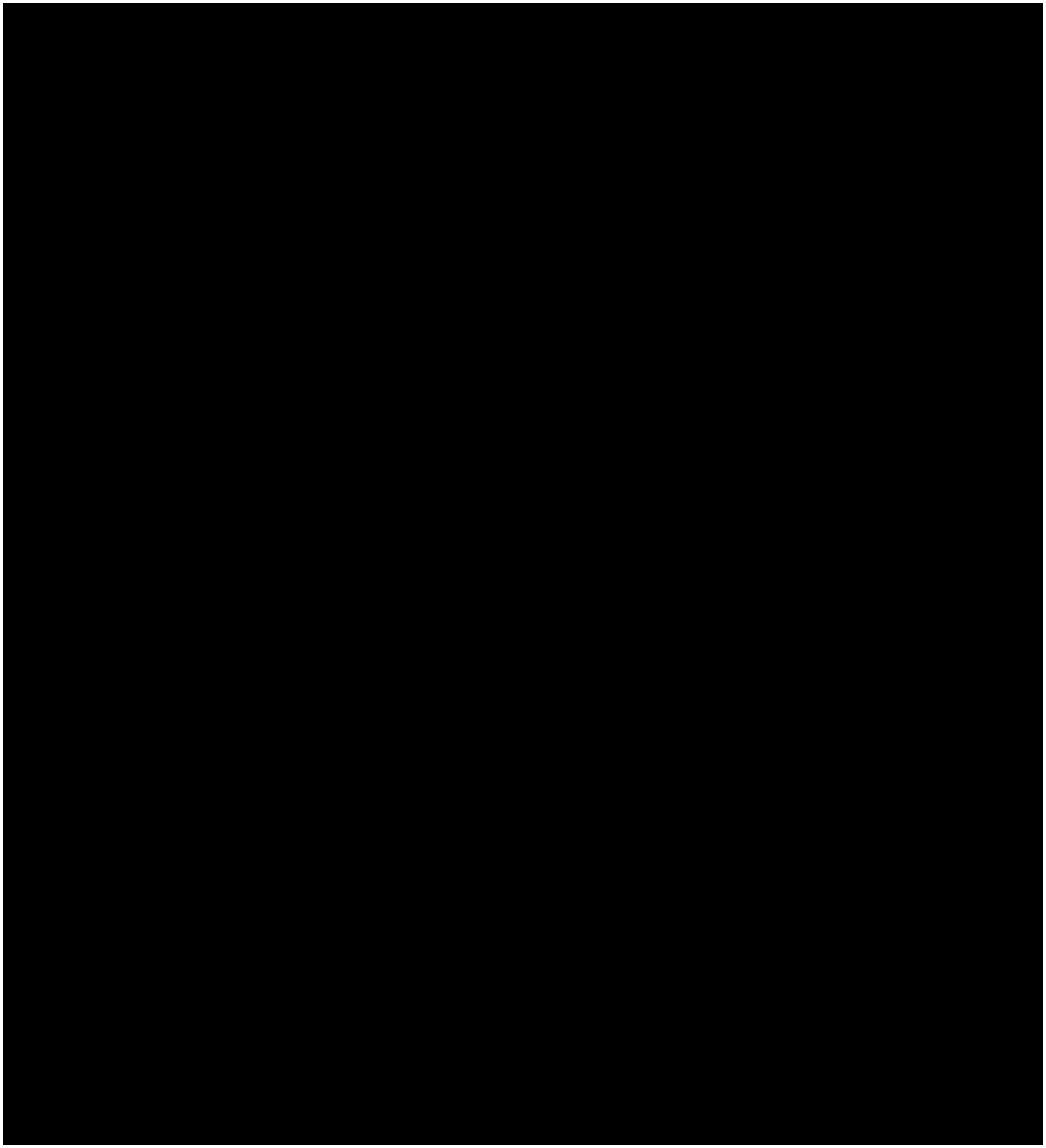
As a result, Lower Frankton has been identified as a strategically located connection node within this corridor, and forms part of a wider Mid Wales network development strategy. As such, the scheme has been assessed as a coordinated transmission investment rather than an isolated customer connection project, supporting the integration of contracted customer connections, including those with signed Connection Agreements, while maintaining flexibility to accommodate credible future network requirements identified through strategic network planning. This coordinated approach reduces the likelihood of inefficient, piecemeal reinforcement and aligns with whole-system planning principles.

To facilitate these requirements and maintain network operability, the project includes enabling works such as a double turn-in of the Legacy–Ironbridge and Legacy-Ironbridge-Shrewsbury OHL and reverse power flow control schemes for the SGTs, outlined in Table 2. The investment

enhances regional network capability, resilience and operational flexibility, supporting the integration of increasing generation capacity and management of changing power flow patterns across the transmission network. The scheme is also aligned with wider strategic network planning, including future reinforcement options identified through NESO's Beyond 2030 work, which identified Lower Frankton as a preferred location for additional power flow control assets.

Figure 2: Lower Frankton Regional Context





Interactive projects

The following projects interact with the Lower Frankton project:

Table 2: Interactive projects

Project	Details	Status
Ironbridge - Legacy - Shrewsbury, Ironbridge - Legacy 2 OHL Reconductoring (Part of Connah's Quay project, previously named Deeside)	Lower Frankton is closely linked to the wider transmission reinforcement programme, including the Legacy – Ironbridge – Shrewsbury circuits uprating, which increase transfer capability on the transmission corridor into which Lower Frankton connects. Whilst the proposed Lower Frankton development delivers the primary network capacity required to accommodate future customer demand and generation growth, delays to the reconductoring programme may constrain the full network capability and operational flexibility expected from the wider reinforcement strategy until these works are completed.	The Eligibility Letter under the Load-Related Re-opener for "Deeside – Legacy – Trawsfynydd 1 and 2, Ironbridge – Legacy – Shrewsbury, Ironbridge – Legacy 2 OHL" is being submitted in October 2026. Outages are in place for [redacted] and [redacted] to undertake the work, and a contractor has been allocated the work [redacted]
Pentir to Swansea New Circuit in [redacted] (PSNC) (Split into Mid Wales New Circuit (MWNC/1) and Upper Wales New Circuit (UWNC))	The original PSNC concept has evolved into the separate UWNC and MWNC/1 strategic reinforcement projects. Together, these schemes increase North-South transfer capability, support future generation connections, enhance network resilience, and enable wider network development across Wales. Lower Frankton has been identified as a potential connection node for UWNC and MWNC/1. Whilst both projects will undertake further siting assessments to confirm their preferred connection locations, the potential for connection at Lower Frankton remains a key consideration underpinning this proposal.	The June 2026 Beyond 2030 Electricity Transmission Update confirmed a proceed signal for UWNC and MWN1/C, while removing SHNC. The removal of SHNC means UWNC and MWNC/1 are now fully interdependent projects. Following this proceed signal, we are now working towards the best way to progress the projects and will engage with Ofgem on this. These options are also subject to the Strategic Spatial Energy Plan back-check.

Site background

Lower Frankton is located in a rural area of Shropshire, shown in Figure 4, with the nearest major settlement being Oswestry, approximately 4 km to the west. The proposed substation site is surrounded by small villages, predominantly agricultural land, intermittent woodland, and the Shropshire Union Canal to the north-east.

The substation location is between the existing Ironbridge, Shrewsbury and Legacy substations on the Legacy-Ironbridge-Shrewsbury circuit, refer to Figure 3. However, as previously mentioned, we have reassessed the substation siting study to ensure the current location (Figure 4) remains optimal in light of updated drivers, considering future requirements, construction, system integration and stakeholder impact.



Historical funding

We requested Pre-Construction Funding as part of our Eligibility Letter submission in May 2026. Whilst we have not yet received formal approval of PCF, draft determinations indicate that the full 8.2% allowance will be allocated.

Early Asset Write Offs (EAWO)

This investment involves the construction of a new substation at Lower Frankton and associated overhead line turn-in works. As the project does not replace existing substation assets, previous interventions, historic asset spend and remaining Regulated Asset Value (RAV) are not applicable. While the design requires the decommissioning of tower ZZK058, and the construction of new towers ZZK058A and ZZK058B, a review of the register has identified no remaining RAV for recovery.

2. Drivers and need case

The need for a new 400/132 kV substation at Lower Frankton is driven by the requirement to connect [redacted] and five associated BEGA generation schemes with contracted Gate 2 offers. The investment is justified independently of future generation developments, UWNC/MWNC, or future Quad Boosters, although these have informed the design and size of the preferred solution to support efficient long-term network development.

Customer connection milestones remain subject to the ongoing Connections Reform process. Consequently, we have based the programme assumptions in this submission on current information and will confirm ACL dates and programme timelines at Project Assessment.

Table 3: Investment drivers

Summary of drivers		ACL date
[redacted] IDNO connection	New 132kV IDNO substation and associated BEGA-backed onshore wind generation require a new transmission connection point and transformer capacity. For a full list of current Gate 1 and 2 customers, refer to Table 4 or Table 18 Note: Discussions throug [redacted] and NGET have identified no confirmed DNO requirement for a connection at this location.	To be confirmed pending Connections Reform
Wider system operability – flow control devices	Lower Frankton enables the future integration of power flow control assets, including Quadrature Boosters, to manage power flows, maximise boundary transfer capability, alleviate network constraints and support the efficient integration of renewable generation. These assets are driven by requirements identified through the tCSNP2 Refresh and documented within NESO's Beyond 2030 pathway.	Targeted for [redacted]
North-South Wales Reinforcement - Strategic network interaction	Lower Frankton is the preferred connection point for both the UWNC and MWNC/1 projects, providing a connection node for the proposed new 400kV network development in Wales.	[redacted] (UWNC) [redacted] (MWNC/1)

2.1 Customer

Table 4 provides an overview of customer connections relative to this investment and the impacts of Connections Reform. A map showing customer locations is provided in Figure 5.

Some of the following customers, who had prior contracts to connect at Lower Frankton, have now received Gate 1 offers through Connections Reform. Consequently, these customers no longer hold active contracted offers with NESO for site connection. Their inclusion illustrates the number of connections previously considered during the investment optioneering process. Although these drivers are currently on hold, we have ensured that our proposed preferred solution continues to be the most appropriate and efficient approach to meet the confirmed Gate 2 customers and any other relevant drivers.

Table 4: Details of customers with contracted connections

Customer Name	Project Name	Technology Type	Demand Capacity (MW)	Transmission Entry Capacity (MW)	Voltage	ACL Date*	Connections Reform Gate / Phase
Direct connection to 400kV							
[redacted]					400kV	N/A	Gate 1
					400Kv	N/A	Gate 1
					400kV	N/A	Gate 1
					400kV	N/A	Gate 1
					400kV	N/A	Gate 1
[redacted]		IDNO		693*	400kV	Tbc	Gate 2 Phase 2
Customers connecting via [redacted] IDNO:							
[redacted]					132kV	Tbc	Gate 2 Phase 2
					132kV	Tbc	Gate 2 Phase 2
					132kV	Tbc	Gate 2 Phase 2
					132kV	Tbc	Gate 2 Phase 2
					132kV	Tbc	Gate 2 Phase 2
					132kV	N/A	Gate 1
					132kV	N/A	Gate 1

Please Note: [redacted] holds the contracted transmission connection. The BEGA energy park projects listed beneath [redacted] are downstream connections that utilise the IDNO network and are shown for completeness only. *693MW represents the total TEC associated with the Gate 2 Phase 2 IDNO connections.

Customers marked as “tbc” are pending ACL date confirmation through the Connection Reform process.

[redacted]

2.2 Asset health

Although the selection of the preferred load-driven intervention will affect how we manage the health of the assets at this substation, there is currently no fundamental asset health driver for interventions that is considered likely to affect the scope or timing of this project.

The project interfaces with the existing ZZJ/ZZK overhead line route through modifications to a limited number of towers to facilitate the turn-in, however there are no asset health interventions planned as part of this investment.

2.3 NESO

In assessing the preferred option, we considered future NESO-signalled network developments outlined in the Beyond 2030 – Electricity Transmission Update[1] and accompanying Technical Report[2] (published June 2026). The proposed [redacted] bay substation has been designed to accommodate the future NESO-signalled strategic drivers, which are summarised below.

North-South Wales Reinforcement

Lower Frankton has been identified as a potential landing point for the proposed Upper Wales New Circuit (UWNC) scheme and as a potential start node for Mid Wales New Circuit (MWNC/MWN1), subject to confirmation through independent siting studies.

Should Lower Frankton be selected, it would become a more strategic transmission node, with two 400kV double circuit routes terminating at the substation: the new Bodelwyddan-Lower Frankton route and the existing Legacy-Lower Frankton route. This configuration leaves only one 400kV double circuit route connecting Lower Frankton to Ironbridge, increasing the potential for constraints on the Lower Frankton-Ironbridge circuits during periods of high-power transfer. However, this potential drawback is not currently considered material to the site selection decision, as the associated operational impacts are manageable and are outweighed by the strategic benefits of Lower Frankton's location within the future transmission network.

Lower Frankton Quadrature Boosters

The NESO Beyond 2030 report identifies a need for additional network capability across North Wales, Mid Wales and the West Midlands to accommodate increasing generation and evolving power flow patterns. As part of this wider strategy, NESO has identified Lower Frankton as the preferred location for [redacted] Quadrature Boosters (QBs), recognising its strategic position on the transmission network and its role in delivering the power flow control capability required by the tCSNP2 Refresh.

The Lower Frankton site was already identified as the preferred location to meet contracted customer connection requirements, and a subsequent back-check of the siting study confirmed it remains the preferred option capable of accommodating both customer connections and the additional tCSNP2 network reinforcement requirements identified by NESO.

The proposed QBs at Lower Frankton would improve management of North-South Wales power flows, increase transfer capability across key network boundaries, and support the efficient utilisation of future strategic network reinforcements, including MWNC/MWN1.

[1] Beyond 2030 - Electricity Transmission Update, June 2026

[2] Beyond 2030 - Electricity Transmission Update – Technical Report, June 2026

3. Optioneering

This section explains how we assessed the connection options for the new substation.

We have applied a staged, multi-factor optioneering process to identify the preferred option.

i. We start by determining the most suitable strategic option, shown in Table 5. Strategic optioneering determines the type of investment we should develop.

ii. We then consider a longlist of technical options within each investment type, down selecting to a shortlist of options, shown in Table 6.

iii. We then consider a shortlist of technical options, selecting a preferred option based on a qualitative balanced scorecard of considerations: Engineering, environmental, deliverability, economic/consumer value and consenting/stakeholder.

iv. We then assess quantitatively all shortlisted options in a CBA to determine which technical option provides greater Net Present Value.

v. We then consider the outputs of both step 3 and 4 to provide a final preferred option.

Siting studies inform decisions on whether options should be rejected or progressed. Although this document presents the process sequentially, siting work is often undertaken in parallel with the assessment of longlisted and shortlisted options.

3.1 Strategic options

We considered the following strategic options:

Table 5: Strategic direction setting

Option	Description
Option A: Do nothing	This option involves making no changes and therefore doing nothing to facilitate the connection of customers.
Option B: Market based solution	This option involves accommodating increased customer demand through the procurement and use of ancillary services only.
Option C: Non-transmission, whole systems solution	This option involves addressing the identified need without constructing new transmission assets, instead relying on coordinated interventions across the wider electricity system.
Option D: Make use of existing assets	This option involves making use of existing infrastructure such as substations and could include extension or uprating.
Option E: New Substation	This option involves construction of a new substation.

We assessed a range of options to meet the Lower Frankton connection requirements, including non-network solutions, extension of existing substations and new-build substation configurations. Options A-C were discounted as they could not deliver a compliant physical connection solution capable of delivering the required connection capacity.

Options D1-D3, involving the extension of existing substations, were discounted due to insufficient space for the required 460 MVA SGTs and the significant reinforcement works required to facilitate expansion. We therefore concluded that the identified drivers are most effectively met through a new 400/132 kV AIS substation at Lower Frankton (Option E).

Options E1-3 were assessed as new-build AIS substations comprising [redacted] bays. Option E-1 [redacted] bays) was discounted as it could not accommodate the wider strategic network requirements without future expansion. As such, Options E-2 [redacted] bays) and E-3 ([redacted] bays) were progressed to the shortlist as both provide a compliant solution capable of accommodating contracted customer connections and identified network drivers.

In line with our internal processes and Ofgem's Load Re-Opener Guidance, we have undertaken a proportionate multifactorial assessment of the options to identify the option that offers the best overall outcome for consumer.

A descriptive rationale for rejection or progression from the longlist is explained in Table 6.

Table 6: Assessment of Longlist Strategic Options

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
A: Do minimum **(Not progressed)**	The network is kept in its current state, and no new connections are facilitated.	N/A	No new environmental or consenting impacts as no new infrastructure is proposed, but does not address identified connection requirements	**Engineering:** Compliant customer connection not delivered. Under conditions of its Transmission Licence (Licence Condition C8), we have a statutory duty to make offers to provide connections to signed customer agreements. Licence Condition C17, requires NGET to plan, develop and operate the transmission system, in accordance with the NETS SQSS. The Do-Nothing option was therefore discounted as it would go against NGET Licence Obligations.
B: Market-based solution **(Not progressed)**	Increased customer demand is accommodated through the procurement and use of ancillary services only.	N/A	No new environmental or consenting impacts. Does not require land take or planning consent but does not deliver the physical infrastructure required for customer connections.	**Engineering:** Compliant customer connection not delivered. New customer connections require physical connections to the transmission network. The market-based option was discounted as it does not enable this.
C: Non-transmission, whole systems solution **(Not progressed)**	The required customer connection is accommodated by a DNO instead of NGET.	N/A	Environmental and consenting impacts would be dependent on third-party infrastructure requirements and have therefore not been assessed.	**Engineering:** Compliant customer connection not delivered. The non-transmission, whole system solution was discounted as new customer connections require a physical connection to the transmission network.
D-1: Connection to Legacy Substation **(Not progressed)**	Works to extend existing substation within existing operational land.	N/A	Lower planning risk as works are within an existing operational substation and could utilise Permitted Development Rights. Potential constraints	**Engineering:** Requires significant reinforcement works, feeder uprating, and protection changes. Legacy does not have sufficient physical space to accommodate the [redacted] 460 MVA SGTs required for the contracted connections, due to site-specific topographical and terrain constraints.

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
			associated with limited construction space, access requirements, outages and working within a live environment.	**Deliverability:** Programme risk to achieving the required connection date is high based on comparable reinforcement projects. Extensive outage requirements and construction within live assets introduce programme and safety risk. **Environmental and Lands:** Site is constrained physically by adjacent energy infrastructure (BESS), watercourses and surrounded by high-value habitats such as dense woodland. **Consumer value:** The option would not provide space for future generation connections or support the potential future connection of the UWNC and MWNC projects, unlike the new substation option.
D-2: Connection to Ironbridge Substation (Not progressed)	Works to extend existing substation within existing operational land.	N/A	Lower planning risk as works are within an existing operational substation and could utilise Permitted Development Rights. Potential constraints associated with limited construction space, access requirements, outages and working within a live environment.	**Engineering:** Requires significant reinforcement works, feeder uprating, and protection changes. Ironbridge does not have sufficient physical space to accommodate the [redacted] 460 MVA SGTs required for the contracted connections, due to being surrounded by ex-power station land. **Deliverability:** Programme risk to achieving the required connection date is high based on comparable reinforcement projects. Extensive outage requirements and construction within live assets introduce programme and safety risk. **Environmental and Lands:** No available land, site is physically constrained by adjacent railway, River Severn and topography, as well as being surrounded by ex-power station land which is subject to site wide redevelopment. **Consumer value:** The option would not provide space for future generation connections or support the potential future connection of the UWNC and MWNC projects, unlike the new substation option.

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
D-3 Connection to Shrewsbury Substation **(Not progressed)**	Works to extend existing substation within existing operational land.	N/A	Lower planning risk as works are within an existing operational substation and could utilise Permitted Development Rights. Potential constraints associated with limited construction space, access requirements, outages and working within a live environment.	**Engineering:** Shrewsbury is a tee connection from the transmission line to a transformer supplying the DNO network, it does not have an existing transmission substation arrangement capable of accommodating the required connections. Delivering this option would require the construction of significant new transmission infrastructure, making it effectively a new substation development rather than a straightforward extension of an existing site. **Deliverability:** As the option would require the development of substantial new transmission infrastructure, it offers limited deliverability advantages over a new substation. It would introduce additional complexity associated with constructing new assets within and around an operational network environment, resulting in increased programme, outage and construction risk. **Environmental and Lands:** Site is physically constrained by adjacent canal, major highway (A5) and residential properties in close proximity. **Consumer value:** The option would not provide space for future generation connections or support the potential future connection of the UWNC and MWNC projects, unlike the new substation option.
E-1: [redacted] bay, 400kV AIS **(Not progressed)**	Provision of a grid connection for [redacted] only, without full substation bay build out. The Substation would be 5000A continuous rated, 63kA fault level	N/A	New greenfield development requiring TCPA and Section 37 consents. Smaller land take and lower initial landscape, ecological and construction impacts than E-2 and E-3, although	**Engineering:** Provides IDNO customer connection to the National Electricity Transmission System (NETS). **Consumer Value:** This solution would facilitate the connection of contracted customers but offers limited adaptability to accommodate future demand or generation growth in the region and would not support the potential connection of the UWNC and MWNC projects. This could necessitate further upgrade

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
	capability, comprise of [redacted] sections, sections breakers, [redacted] 460MVA SGTs and [redacted] bus coupler.		future expansion would result in additional consenting requirements and environmental disturbance.	work in the future, resulting in additional upgrade costs and higher whole-life expenditure. **Stakeholder impact:** Lower initial visual impact and construction traffic/noise however future expansion would present comparable impacts to E-2 and E-3. **Consent and Land:** Smaller footprint mitigates consent challenges and land requirements however future expansion would present comparable challenges to E-2 and E-3.
E-2: [redacted] bay, 400kV AIS (Progressed)	New build [redacted] bay substation providing sufficient firm capacity for forecast growth. The Substation would be 5000A continuous rated, 63kA fault level capability, comprise of [redacted] sections, sections breakers, [redacted] 460MVA SGTs, [redacted] bus couplers and [redacted] spare bays.	N/A	New greenfield development on Grade 3 agricultural land requiring TCPA and Section 37 consents. Moderate landscape, ecological and construction impacts, with limited vegetation clearance anticipated. Future expansion may be required, resulting in additional consenting and environmental impacts.	The [redacted] bay option can accommodate all current contracted Gate 2 connections and includes [redacted] spare bays to support identified strategic network requirements, including UWNC, MWNC/MWN1 and Quad Boosters. However, the limited number of remaining spare bays reduces flexibility to accommodate future generation connections and may require site expansion should additional requirements materialise.
E-3: [redacted] bay, 400kV AIS (Progressed)	Larger new build [redacted] bay substation providing maximum future capacity and operational flexibility. The Substation	N/A	New greenfield development on Grade 3 agricultural land requiring TCPA and Section 37 consents. Largest initial land take and construction footprint of the options;	Addresses all identified customer and strategic network drivers within a single, PASE primary option, AIS substation design, including provision for UWNC, MWNC/MWN1 and future Quad Boosters for power flow control capability required by the tCSNP2 Refresh.

Option name and status (progressed/not progressed)	Technical Description	Relevant diagrams, layout or SLD reference	Consenting risk and environmental constraints	Rationale for rejecting or taking forward the option
	would be 5000A continuous rated, 63kA fault level capability, comprise of [redacted] sections, sections breakers, [redacted] 460MVA SGTs, [redacted] bus couplers and an increase to [redacted] spare bays.		however, it reduces the likelihood of requiring subsequent site expansion and associated future consenting, construction and environmental impacts.	This option provides sufficient flexibility to accommodate both current and future anticipated network requirements within a single development. This option best aligns with the 'build once' principles and was therefore progressed to the shortlist.

3.2 Siting

Taking forward Options E-2 and E-3, we then commissioned [redacted] to undertake a siting study to identify suitable locations for a new substation between Legacy and Shrewsbury substations. The study was undertaken in accordance with NGET's statutory duties and relevant planning policy, including the Electricity Act 1989, the Horlock Rules, the National Planning Policy Framework (NPPF) and National Policy Statements (NPS). To reflect a 'worst-case' scenario of needing a larger land take, the initial assessment assumed an AIS substation with an indicative footprint of 500m x 500m, and the back check footprint was increased to 500m x 650m to accommodate the additional drivers.

Refinement of Study Area

We identified a study corridor extending approximately 45 km between Legacy and Shrewsbury substations and initially limited potential locations to within 2 km of the existing 400 kV overhead line to minimise additional infrastructure requirements, environmental impacts, consenting complexity, programme risks and costs.

The initial 2 km corridor identified a substantial number of potentially suitable sites. Therefore, the study area was refined to 500 m either side of the overhead line to focus the assessment on locations that could realistically connect to the existing network while remaining technically, environmentally and economically feasible. This approach enabled a proportionate assessment of credible options without excluding viable development opportunities. Figure 6 shows the refinement from the initial 2km corridor (blue dotted line) to the final 500m corridor (purple dotted line). Figure 7 shows the sites shortlisted in the 500m corridor. This process identified 17 long-list sites across five focus areas, which were assessed against environmental, technical, land use and accessibility criteria.

Siting Re-assessment

Following identification of Lower Frankton as the preferred location, NGET undertook a siting study back-check and review to validate the site selection against updated project requirements. The reassessment was prompted by customer connection requirements and subsequent design development, including the need to accommodate the NESO-driven flow control devices (potential [redacted] Quad Boosters) and [redacted] Super Grid Transformers, which increased the required substation footprint beyond that considered in the original study.

Applying the original assessment methodology, alongside refinements including updated buffer assumptions and a review of Public Rights of Way, the long-list sites were reassessed using the larger development footprint, focussing on the following criteria:

- Availability of space to accommodate the proposed development (25 ha minimum);
- The need to minimise the connection distance to the existing OHL and therefore, locate site options within 500m of the OHL (some overlap with the study area boundary is considered acceptable);
- The need to minimise potential direct impacts upon key environmental receptors including the natural environment, cultural heritage, landscape and visual amenity caused by proximity to residential properties;
- Potential to mitigate visual impacts through the introduction of new planting and/or earthworks;
- Availability of suitable access.

The review confirmed that Lower Frankton remained the preferred site from environmental, land use and technical perspectives and continued to represent the most appropriate location for the proposed development.

See Table 7 for an appraisal on the shortlisted site locations.





Table 7: Shortlisted Site Locations - Options Appraisal and RAG

Site location option	2-A [redacted]	4 (Lower Frankton)	5-2 [redacted]
Environmental			
Ecology	Hedgerow and tree loss required; protected species impacts manageable through mitigation and habitat replacement.	Hedgerow loss and protected species considerations; residual impacts unlikely to be significant.	Trees, ecological corridors and ponds present; impacts manageable with mitigation and habitat enhancement.
Water	Outside Flood Zones; no significant residual flood risk or water resource effects anticipated.	Groundwater protection constraints and drainage ditches require consideration; impacts can be mitigated.	Flood Zone 3 crosses preferred area; residual effects cannot be fully ruled out, would require further flood risk assessment.
Landscape and visual	Open landscape with limited screening; noticeable visual effects and PRoW diversion required.	Significant local landscape change despite few visual receptors and existing screening.	New landscape feature with limited visual receptors; screening opportunities available.
Historic environment	Potential setting effects on [redacted] due to proximity and limited screening.	Potential setting impacts on nearby listed buildings requiring detailed assessment and mitigation.	Limited heritage constraints; potential setting effects mainly if development extends eastwards.
Land quality	Agricultural land loss anticipated; ALC survey required to confirm land classification	Predominantly Grade 3 land.	Predominantly Grade 4 land with limited agricultural land constraint.
Amenity	Nearby dwellings and commercial properties may experience visual and operational noise impacts.	Impacts focused on nearby residential receptors, particularly [redacted] mitigation likely required.	Few nearby residential receptors, but site benefits from existing woodland screening.
Socio-economic			
Traffic, transport	Construction traffic through local settlements and PRoW diversion likely required.	Temporary construction traffic impacts; good direct A-road access. No PRoW within substation site.	Temporary traffic impacts manageable through routeing and construction traffic management
Economic activity	Localised effects on nearby businesses and agricultural land; no overriding socio-economic constraints.	Temporary disruption to nearby receptors; no significant socio-economic barriers identified.	Limited socio-economic impacts due to sparse residential and business receptors.
Land and Planning			
Planning	Development feasible but affected by amenity, PRoW and heritage considerations.	Development not ruled out; heritage and residential impacts require careful management.	Development broadly compatible subject to flood risk and environmental mitigation.

Site location option	2-A [redacted]	4 (Lower Frankton)	5-2 [redacted]
Land restrictions	Multiple adjacent properties, PRoW crossing site and fragmented ownership constraints	Additional access land required and nearby heritage assets require consideration, but constraints manageable.	Multiple ownerships and tenancy interests present but ample land availability remains.
Technical			
Technical	Significant earthworks, constrained layout and access challenges increase delivery complexity.	Technically feasible with manageable access, OHL diversion and construction constraints.	Low technical complexity; principal constraint relates to securing suitable access route.
Overall Summary of Shortlisted Site			
Summary of Option	**Not preferred** Ecologically preferable due to limited vegetation clearance requirements, but overall constrained by significant landscape and visual impacts, PRoW diversion, substantial hedgerow loss, and potential adverse effects on the setting of nearby heritage assets, particularly Grade II* [redacted].	**Preferred Site** Balances ecological, landscape and heritage considerations most effectively, avoiding woodland loss while benefiting from existing screening and limited visual receptors, with manageable environmental and heritage impacts compared to the alternative site options.	**Least preferred** Offers the strongest landscape integration and screening potential with comparatively limited visual effects, but is significantly constrained by ecological sensitivities, flood risk, watercourse interactions, and potential heritage setting impacts, making it the least preferred ecological option.

**Amber (lighter) = Constraints are likely to require further assessment but are also likely to be capable of resolution. Would not need to avoid.*

***Amber (darker) = Constraints are likely to require detailed assessment and/or mitigation and should be avoided if possible.*

Siting conclusion

We considered a range of alternative locations for the Lower Frankton 400 kV substation, excluding sites on Grade 1 and Grade 2 agricultural land and within the Green Belt to minimise environmental impacts and planning risk. Following a comparative appraisal of environmental, socio-economic, planning and technical factors, our preferred site is Lower Frankton (site 4) as it provides the most balanced and deliverable solution overall.

While the appraisal identified some localised constraints relating to landscape, heritage and residential amenity, none are considered to fundamentally affect deliverability. The site benefits from its proximity to the customer connection location and existing transmission infrastructure, avoids significant flood risk constraints, requires limited vegetation removal and provides opportunities to mitigate residual effects through detailed design, micro-siting and landscaping. The preferred Lower Frankton site can accommodate both the E-2 and E-3 options without significant environmental or engineering constraints.

Overall, we conclude that the Lower Frankton site is the most suitable, sustainable and deliverable option, providing the best balance of environmental, planning, technical and operational considerations while enabling an efficient connection to the transmission network.

Stakeholder influence on shortlisting

We considered stakeholder influence throughout shortlisting, with customer requirements necessitating a compliant connection solution. Options involving extension of existing substations were discounted because they could not accommodate all identified connection and network drivers due to physical and operational constraints. In particular, there is insufficient space at existing substations to accommodate the required connections and future network reinforcements. These options would also require extensive outages to modify and expand operational assets, increasing delivery complexity, programme risk and network disruption. Environmental and land take impacts for new build options were assessed, noting that both shortlisted options could be built on Grade 3 agricultural land with minimal tree felling.

Stakeholder and Community Acceptance

While the larger footprint of the preferred [redacted] bay option (E-3) may initially attract more local opposition, the difference in stakeholder impact between E-3 and the [redacted] bay option (E-2) is not material when considering future extension needs for E-2. Option E-3 provides capacity to accommodate the anticipated connection of the UWNC and MWNC/1 projects, for which there is a NESO-identified system need, and avoids the potential requirement for additional substations or site extensions in the future. This reduces the risk of repeat construction activity and associated stakeholder and local disruption, while ensuring the network can be developed in an economic and coordinated manner.

Land Requirements

[redacted]

Consenting

We have undertaken early engagement with Shropshire Council regarding the proposed development. Through these discussions, the Council advised that the project should progress through a formal pre-application process supported by a Planning Performance Agreement (PPA). An Environmental Impact Assessment (EIA) Screening Request was submitted in May 2026, and a negative screening opinion was subsequently issued in September 2026,

confirming that an EIA is not required for the consent. We will continue engagement with the Council and other stakeholders, agree a PPA, and seek formal pre-application planning advice ahead of submitting a planning application [redacted]

Nonetheless, we remain cognisant of the concerns held by the local community and MPs about [redacted] project, particularly regarding the visual impact of the proposed 31-mile overhead line. We were aware of these issues when undertaking the shortlisting process, aiming to balance considerations of community impact against system need, especially when evaluating sites that may not naturally screen the substation.

Some work has already gone into liaising with key elected representatives. They have taken a close interest in [redacted] their proposals and approach to engagement. To date, the site ward councillor and Shropshire Council portfolio holder [redacted] have been briefed in general terms regarding the proposals. Similarly, a number of meetings with [redacted] have also taken place. These briefings introduced National Grid more generally along with an outline of the scheme and approaches to consultation.

The OHL diversion is subject to detailed design, however, is anticipated less than 2km in length and would be consented under Section 37, with no Development Consent Order required.

3.3 Shortlisted options

The following shortlisted options were developed and assessed to identify the solution that best meets the confirmed network need and customer connection requirements, while providing an efficient, operable and deliverable design with appropriate capacity for future network developments.

Description of short-list options considered

Option E-2 – Construction of a new [redacted] bay 400kV double busbar AIS substation

Change from [redacted] bay to [redacted] bay option: Option E-2 was assessed as an [redacted] bay AIS substation in the May 2026 Eligibility Letter. Design development identified the need for dedicated bus coupler and generation bays, increasing the layout to [redacted] bays[3], to improve operational flexibility, maintainability and network resilience, without the need to change customer requirements.

Proposed Works:

New [redacted] bay 400kV double busbar AIS substation to the West of the existing 400kV Legacy-Ironbridge 2 and Legacy-Ironbridge-Shrewsbury circuits, comprising:

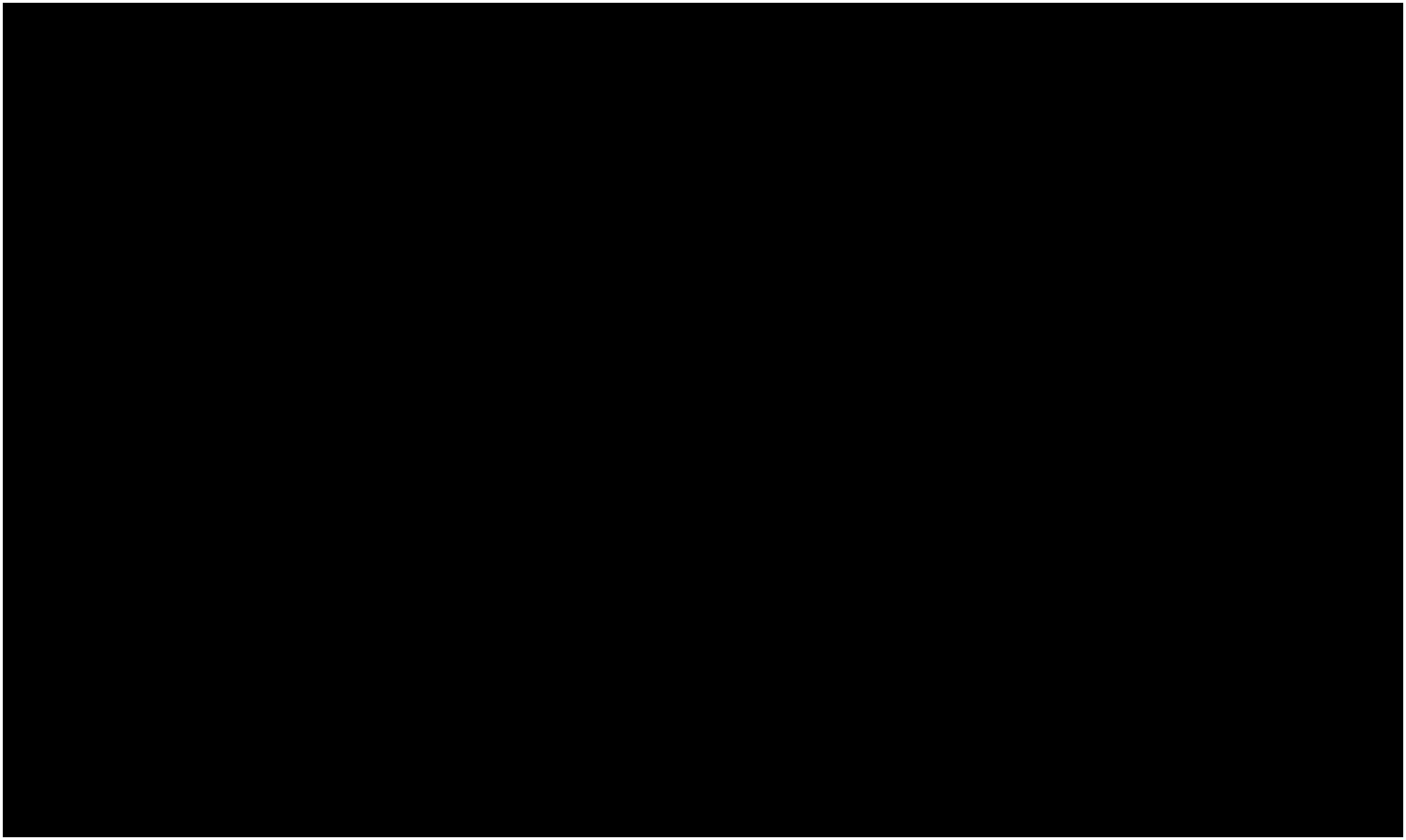
- [redacted] new 400/132kV 460MVA SGT bays;
- [redacted] bus couplers occupying [redacted] bays;
- [redacted] feeder bays, including provision for [redacted] 2750MVA Quad Boosters associated with the OHL turn-in;
- [redacted] section breaker bays;
- [redacted] spare bays in total;

[redacted]

  - [redacted] spare bays expected to be occupied by NESO-signalled reinforcement projects (future UWNC and MWNC/1 connections); and
  - [redacted] spare bays remaining for future generation requirements.
- Install associated substation plant, control buildings and ancillary equipment, including telecommunications, protection and control systems, welfare facilities and a standby diesel generator.
- Construct a new double turn-in from the existing Legacy-Ironbridge-Shrewsbury circuits, including associated 400kV and 132kV cable connections.

How it meets the driver:

- Provides a connection for [redacted] and five contracted Gate 2 customers, allows future flexibility to accommodate UWNC and MWNC/1 connections.



Option E-3 – Construction of a new [redacted] bay 400kV double busbar AIS substation (Preferred Option)

Proposed Works:

Construct a new [redacted] bay 400kV double busbar AIS substation to the west of the existing Legacy-Ironbridge 2 and Legacy-Ironbridge-Shrewsbury circuits, comprising:

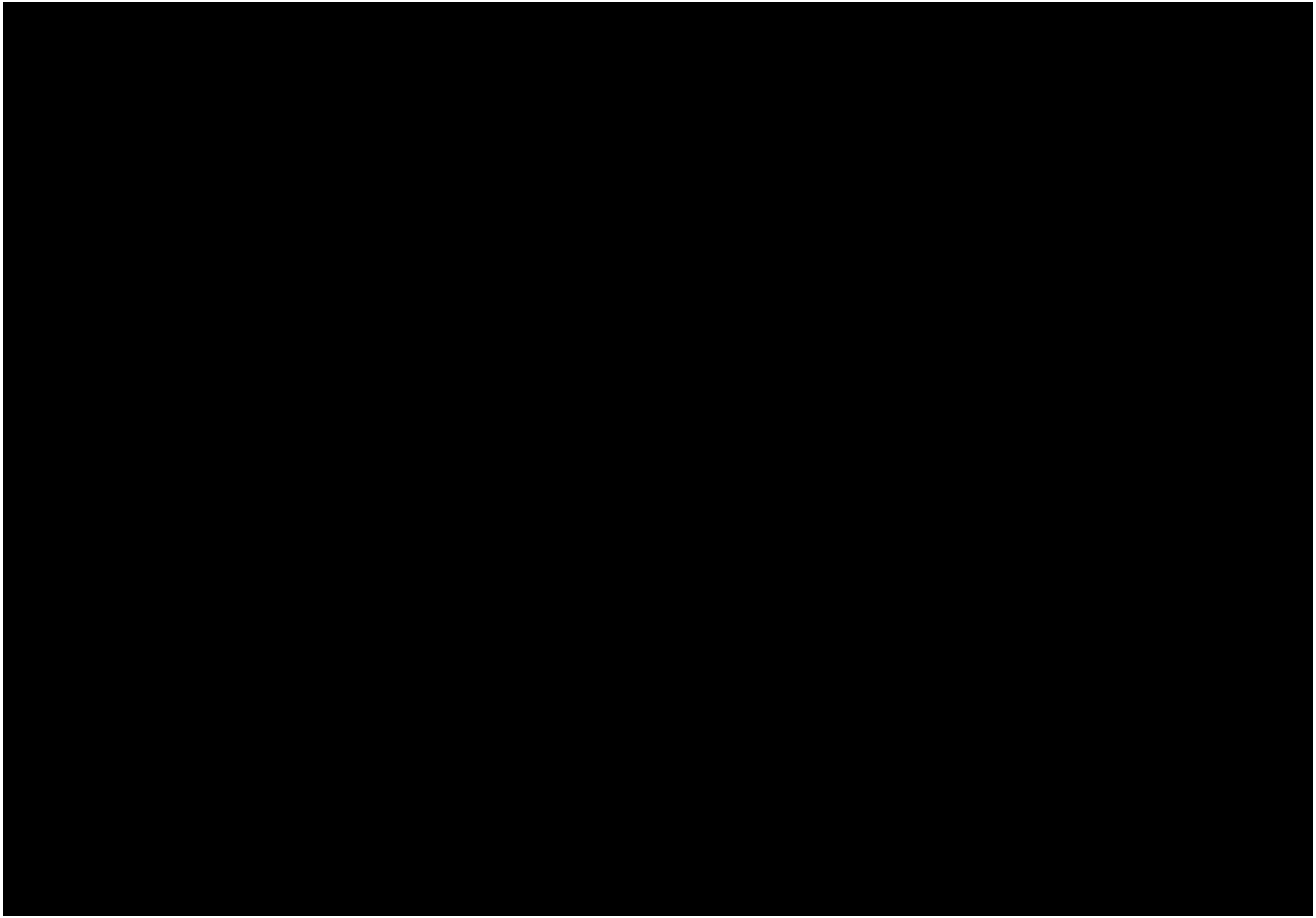
- [redacted] new 400/132kV 460MVA SGT bays;
- [redacted] bus couplers occupying [redacted] bays;
- [redacted] feeder bays, including provision for [redacted] 2750MVA Quad Boosters associated with the OHL turn-in;
- [redacted] section breaker bays;
- [redacted] spare bays in total;
  - [redacted] spare bays expected to be occupied by NESO-signalled reinforcement projects (future UWNC and MWNC/1 connections); and
  - [redacted] spare bays remaining for future generation requirements.
- Install associated substation plant, control buildings and ancillary equipment, including telecommunications, protection and control systems, welfare facilities, portable relay rooms and a standby diesel generator.
- Construct a new double turn-in from the existing circuit, including associated 400kV and 132kV cable connections.

How it meets the driver:

- Provides a connection for [redacted] and five contracted Gate 2 customers.
- Accommodates NESO-signalled reinforcement projects (UWNC and MWNC/1) while providing optionality for future generation requirements within the initial development.

In appraising these two options, we undertook a proportionate, multi factor qualitative assessment to determine which option delivers the best overall outcome for consumers, while meeting the investment drivers. The results are summarised in Table 8.

The System Design Table (SDT) for each option is provided within Appendix B - System design table.



3.4 Qualitative assessment of shortlist

With a high-level screening of the short-listed options complete, each shortlisted option has been assessed in greater depth to understand its engineering feasibility, environmental interactions, deliverability, economic/consumer value, consenting and stakeholder requirements. This assessment provides the comparative evidence needed to show the process of determining the proposed preferred option.

Table 8: Multifactorial analysis

	Optioneering Categories				
Option	**Engineering**	**Environmental**	**Deliverability**	**Economic/Consumer Value**	**Consenting /Stakeholder**
Option E-2 [redacted] bay Substation	× **Construction:** A temporary overhead line diversion would be required to construct the substation; this would need to be constructed west, with through connections and a later turn-in once the substation is built. ✓ **Third-party impacts:** The OHL diversion does not affect nearby woodland habitat. × **Future:** The option provides capacity for identified connection requirements and future UWNC and MWNC connections but provides limited flexibility for further future customer connections. ✓ **Deliverability:** The SGT delivery route has been cleared, and the assessment remains a key logistics consideration. × **Future network:** QB bays may be unviable due to bridge capacity and road restrictions but would be accommodated elsewhere on the network if not possible at Lower Frankton.	× **Landscape:** The substation would influence the landscape and there would be hedgerow loss; impacts would be mitigated through landscape planting and BNG. × **Nature:** Some areas of woodland are priority habitat. Areas of woodland east of the Shropshire Council ecological network may be affected. ✓ **BNG:** Screening and planting would be supported by the BNG approach, but the final baseline and impact are still to be confirmed. × **Visual:** An AIS substation would have a greater visual impact on local views than other options, including fewer mature screening trees to the east. ✓ **Land:** The option is proposed on Grade 3 agricultural land and outside the green belt. × **Ecology:** A long access road would be required, creating additional ecological impact.	✓ **Supply chain:** The supply chain is aware of the intervention and clear of the works [redacted] ✓ **Landowners:** Only [redacted] need to be engaged. ✓ **Access:** The option has an existing access road to the west, allowing the [redacted] to construct the main access road while limiting impact on the main traffic route. ✓ **Programme:** The option would have a slightly shorter construction period, avoiding later extension works and reducing additional [redacted] mobilisation and internal support. × **System access:** System access has been agreed for [redacted] but may need management because the substation is near North/South power flow and outages along the route may be difficult. (Single circuit outage only) × **Interface:** Significant laydown and welfare areas are required for both builds. × **Community:** High construction traffic, noise and pollution may affect the local population.	✓ **Customer scope:** A significant amount of renewable generation is contracted at Lower Frankton, supporting regional and national decarbonisation targets. ✓ **Connections:** All identified contracted customers are included, and allowance to connect future UWNC and MWNC/1 projects. × **Future generation:** Limited future capacity would remain once contracted connections and UWNC/MWNC projects are accommodated; expansion may be required for future generation drivers.	✓ **Footprint:** The initial footprint is smaller, but later expansion may push the eastern boundary closer to Option E-3. × **Landowners:** Whilst the land take required for the project is less, there are still potential [redacted] × **Stakeholder feedback:** No definitive feedback has been received at this stage. × **Planning:** Significant visual impact on the local landscape is anticipated, although there are opportunities to screen the substation from view.
	Benefit	Detractor	Benefit	Benefit	Neutral

	Optioneering Categories				
Option	**Engineering**	**Environmental**	**Deliverability**	**Economic/Consumer Value**	**Consenting /Stakeholder**
Option E-3 [redacted] Bay Substation	As with Option E-2, however this option: ✓ **Future flexibility:** Accommodates the future connection of the UWNC and MWNC projects and provides greater flexibility for additional generation connections. ✓ **Future extensions:** Reduces the likelihood of future substation extensions and the associated cost, construction impacts and network disruption. ✓ **Reduced connection time:** Readily available connection bays reduce delivery times for future customers by avoiding additional substation expansion work.	As for Option E-2 however this option: × **Land:** Has a slightly greater land take and a marginally greater environmental impact than Option E-2, reflecting the additional footprint required. ✓ **Nature:** Minimises impacts to high-value habitats as the additional land take is expected to be lower-value agricultural land. ✓ **Carbon:** Avoids the environmental impacts of later site extension, reducing whole-life environment and sustainability impacts. ✓ **Construction efficiency:** Delivers the required capacity through a single construction programme, reducing whole-life carbon and resource consumption through one period of site clearance, mobilisation, manufacturing, delivery and construction.	As for Option E-2 however this option: × **Construction scope:** Results in a larger upfront construction scope than Option E-2. ✓ **Future delivery risk:** Reduces the need for future substation extension works and the risk that future delivery could be delayed by constraints relating to [redacted] availability, equipment procurement, internal resource availability or access to suitable outages. ✓ **Programme:** Delivering the infrastructure as part of the initial project provides greater programme certainty and reduces future delivery risk.	As for Option E-2, however this option: ✓ **Future:** Provides capacity for identified future network requirements, including the UWNC and MWNC projects and an additional [redacted] bays for future generation customers within the initial build. ✓ **Consumer value:** Reduces the likelihood of future substation extension works, avoiding additional mobilisation, outage, consenting and construction costs and providing greater long-term value for consumers.	As for Option E-2 however this option: × **Stakeholder:** May be more prone to local opposition due to the larger initial footprint, although the impact is considered similar when allowing for the potential future expansion of Option E-2. ✓ **Community:** Minimises the need for future extensions and avoids re-mobilising a major construction site later, reducing future disruption to local communities and additional environmental impacts associated with further construction activity.
	Benefit	Neutral	Benefit	Benefit	Neutral

Qualitative assessment output

Based on the qualitative assessment, we have selected Option E-3 as our preferred option because it:

- Provides all the core capability of E-2 while also providing better future flexibility by allowing scope for future generation customers alongside NESO-signalled UWMC and MWNC/1 connections within the initial build. The Option E-3 is designed to provide an enduring, long-term solution for the region and in this regard aligns closely with Ofgem's desire for adaptable, future proofed designs - a key principle of ETDP[4] and PASE[5].
- The preferred site is located on predominantly Grade 3 agricultural land and can be delivered with limited tree removal, helping to reduce impacts on higher-value agricultural land and established vegetation.
- Reduces whole-life sustainability impacts by enabling a single construction phase, avoiding future site remobilisation, reducing vehicle movements and improving efficiencies in procurement, manufacturing and delivery.
- Reduces planning and land risk by minimising repeat local disruption and pressure on delivery resources, supporting an adaptable solution for the region.
- Reduces whole-life programme and delivery risk by incorporating future capacity within the initial development, reducing reliance on future funding, contractor availability, equipment procurement, internal resources and transmission system outages. This approach provides greater programme certainty and reduces the risk of delays associated with future expansion works.

PASE alignment

Option E-3 is a 400kV double busbar substation which is a primary PASE option. The option aligns with PASE principles by:

- **Proportionate**: providing capacity commensurate with current and identified future network requirements.
- **Anticipatory**: incorporating capacity for the future UWNC and MWNC/1 connections, power flow control capability required by the tCSNP2 Refresh and future generation customers within the initial build.
- **Strategic**: supports coordinated strategic network development by establishing Lower Frankton as a strategic connection node for customer connections, North-South Wales reinforcement and future power flow management, enabling multiple network requirements to be delivered through a single investment.
- **Economic**: reducing whole-life costs by avoiding future extension works, remobilisation, minimising long outages and consenting activities.

[4] Electricity Transmission Design Principles (ETDP), specifically OP2 (Environment, Community and Sustainability), OP3 (Economics and Regulation), S2 (Operational Flexibility and Resilience), S3 (Substation Land Considerations), S7 (Substation Space Optimisation) and S10 (Substation Carbon Impact)

[5] Pre-Approval of Solutions by Engineering (PASE) framework, Ofgem Load Re-opener Guidance and Submission Requirements Document

- **Efficient**: improving operational flexibility while reducing future delivery risks associated with contractor availability, supply chain constraints and system access requirements.

3.5 Quantitative analysis of shortlist options

Cost estimates of shortlist options

Cost estimates have been determined using a parametric cost estimating methodology suitable for the stage of development and option selection for this investment. At this point of development, a standard [redacted] has been applied to all options reflecting the typical historic risk and contingency experienced on previous projects of this nature. Both the underlying cost estimates and appropriate risk and contingency levels will be refined and matured as we progress through detailed development of the preferred option and progress to Project Assessment stage.

[redacted]

As shown in Table 9, Option E-2 has the lower initial capital cost, reflecting its smaller [redacted] bay configuration and reduced upfront investment. Option E-3 requires an additional [redacted] of upfront expenditure but has been selected because it delivers a larger [redacted] bay substation that provides greater future flexibility and optionality for accommodating potential network requirements, reducing the need for more costly future expansion. Of the [redacted] spare bays included within Option E-3, [redacted] are expected to be occupied by NESO-signalled reinforcement projects, for which a proceed signal has been issued, and [redacted] additional bays will provide optionality for future generation growth. The additiona[redacted] investment therefore secures optionality against a range of credible future network outcomes.

Table 10 below presents an illustrative future expansion scenario and is not part of the base price comparison. It demonstrates the potential additional costs that could arise if future transmission or generation requirements materialise beyond the current Gate 2 contracted customer requirements.



Under this illustrative scenario, Option E-2(a) may require a future extension of the Lower Frankton site, whereas Option E-3 would provide sufficient additional capacity from the outset. This flexibility is particularly important given the constrained nature of the local network, demonstrated in the longlist analysis (Table 6). This analysis identified no suitable alternative sites within the local network area to accommodate additional capacity requirements, meaning any future network growth would most likely need to be delivered through an extension of the Lower Frankton site. The analysis is therefore intended to illustrate the potential cost implications of future expansion should such requirements materialise.

As such, E-3 represents a strategic upfront investment that may reduce future reinforcement costs, delivery risks and disruption, providing better long-term value for consumers if additional network requirements materialise.

Opex costs are not material to the decision, as per the CBA analysis.

Cost Drivers

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

- All capex estimates for E-2 and E-3 are based on the latest cost book and Estimating Units Lines (EULs), reflecting the required scope and new assets. The cost book's EULs determine capital expenditure, reflecting bay numbers, foundations, and new asset requirements.
- Key cost drivers include physical footprint and associated civil works, which are greater for E-3 due to its [redacted] bay configuration versus E-2's [redacted] bays. E-3's larger footprint increases these costs initially, but it is not material when considering later costs and disruption from site extension required for E-2.
- Programme duration and long-lead items for procurement of major plant and equipment such as SGTs and QBs, are significant cost drivers.
- E-3's larger scope requires greater initial investment but reduces future mobilisation and outage risks by delivering all assets in a single phase.
- Security and site access costs are higher for E-3 initially but become comparable to E-2 when E-2 is extended.
- Operational expenditure (opex) is not included in the comparative assessment, as it is not significant for decision-making between the options.

- All estimates use a 2023/24 price base and assume a 40-year asset life.

Cost Benefit Analysis (CBA)

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 benefit**s: 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 two 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 cost

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

- E-2, a new 400/132 kV AIS substation with [redacted] bays, and
- E-3, a new 400/132 kV AIS substation with [redacted] bays.

CBA outcome

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



The discounted lifetime CBA results (Table 11), indicate Option E-2 ([redacted] bay) delivers the highest NPV ([redacted] 2023/24 base prices), with a [redacted] improvement in NPV relative to Option E-3 ([redacted] bay). However, we have selected Option E-3 as it delivers the best value for consumers when considering future network requirements. While Option E-2 delivers the most favourable base case NPV, Option E-3 would provide the lowest whole-life costs and a [redacted] improvement in NPV if future network requirements necessitate expansion of the E-2 option.

This recommendation analysis is subject to confirmation through deliverability, consents/land, outage and risk considerations, and any CBA sensitivities (e.g. carbon price trajectories) set out in the assumptions below.

Assumptions of the CBA analysis

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.
- Price base: 2023/24 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).

Costs



Benefits

The following benefits have been included within the CBA:

- SF6/Alternative gas leakage

- Transformer Losses
- Carbon cost of construction
- Summary of all Benefits

Table 13 presents the summary of all (undiscounted) benefits, including environmental and non-environmental benefits, considering the central base case carbon price.



3.6 Preferred solution

Based on the outputs of our multi-factor assessment and CBA, our preferred option is E-3: a new 400/132 kV AIS substation with [redacted] bays. While Option E-2 delivers the most favourable NPV under the base case assessment, we have selected Option E-3 as it provides greater flexibility to accommodate future network requirements and delivers the best long-term value for consumers. E-3 enables connection of all current and anticipated requirements, including; the current contracted IDNO connections, NESO-signalled reinforcement requirements including UWNC, MWNC/1 and power flow control capability required by the tCSNP2 Refresh, as well as allowance for future generation customers without later expansion.

We consider Option E-3 to represent the least-regret solution. Whilst Option E-2 could satisfy immediate contracted customer requirements, Option E-3 provides greater flexibility should future transmission requirements materialise. This reduces the risk that additional land acquisition and site expansion would be required at a later date. Delivering the additional capability within the initial construction phase avoids repeat construction activity, additional outages, further planning activity and avoidable disruption to local communities. Option E-3 therefore delivers the strongest whole-life consumer value outcome and reduces the risk of future reinforcement works. E-3 also aligns with Ofgem's principles for adaptable, enduring solutions, and minimises stakeholder objections by reducing repeat local impacts.

The option meets the investment drivers by providing a compliant connection for all contracted customers, accommodating future growth, and supporting regional network resilience. On this basis, E-3 represents the best overall outcome for consumers, combining strong economic

performance, reduced delivery and outage risk, and alignment with long-term strategic objectives.

Project benefits and outputs

Table 14: Summary of outputs and benefits

Output and proposed PCD:	Description
Outputs and benefits	• Construction of a new [redacted] bay 400kV AIS substation and 132kV Cable Sealing Ends (CSEs) at the standard connection boundary, with busbar infrastructure installed across all bays to facilitate future customer connections. • Provision of a compliant and enduring transmission connection for the [redacted] 132kV IDNO substation and associated BEGA-backed generation. • Delivery of sufficient transformer capacity and fault level resilience through [redacted] SGTs, double busbar and 63kA fault rating. • Enables easier connections for future generation connections (up to 3.8GW) with flexibility to accommodate other customers pending Connections Reform as and when required. • Provides a strategic node for the region where existing substations are at capacity and will facilitate network reinforcement projects including UWNC, MWNC/1 and the tCSNP2 QB scheme, enabling large volumes of low carbon generation (including offshore HVDC linked generation) to be exported from North Wales to demand centres. • Designed as a long term, enduring solution that minimises environmental and community impacts by building once rather than extending later, aligning with Ofgem's preference for adaptable, enduring solutions and proportionate optioneering. • Environmental and planning benefits are realised by constructing on Grade 3 agricultural land with minimal tree felling, and the whole-life impact is comparable to smaller options when future expansion is considered. • Consumer benefits include reduced whole-life costs and disruption, as the enduring solution avoids repeat design, extension costs, and local stakeholder nuisance.

4. Delivery

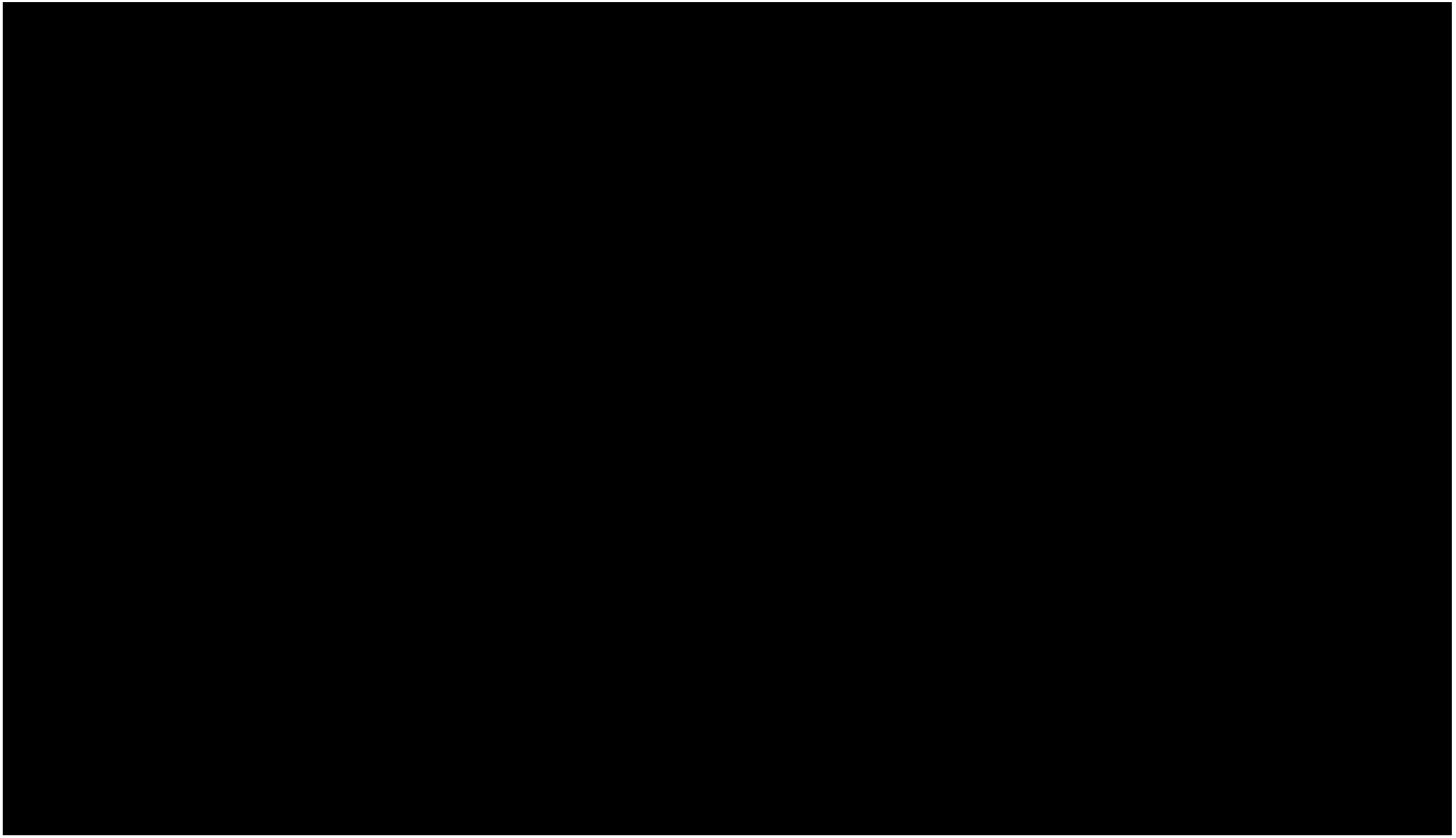
4.1 Delivery year and indicative timeline

The programme has been developed to support the identified network need and is based on current assumptions regarding customer requirements, system access and project dependencies. Delivery dates remain subject to ongoing network planning activities, customer agreements and the implementation of Connections Reform.

The indicative programme covers development, surveys, FEED, planning, land acquisition, procurement, detailed design, construction, commissioning, and handover. Programme milestones and spend profile are detailed in the CBA Support Tool.

Programme detail will be updated at Project Assessment.

Figure 10 details the high-level program for Option E-3.



4.2 Procurement and contracting strategy

Our indicative procurement strategy is to utilise established delivery partners and frameworks where appropriate to deliver the main works. This approach seeks to minimise interface risks between project stages, capture efficiencies through coordinated delivery and value engineering, and maintain flexibility to adopt alternative delivery models should these offer greater value for consumers.

At Project Assessment, we will provide detailed procurement timelines, contractor selection criteria, and evidence of supply chain engagement to demonstrate deliverability and value for money.

4.3 Risks and risk management

An overview of current delivery risks is listed below along with mitigations. As risks continue to evolve, an updated detailed view of risk and mitigations will be supplied within the Project Assessment submission.

Table 15: Summary of risks and mitigations

Risk	Mitigation
Consenting (Programme and Reputational): Delays in obtaining planning permission, discharging planning conditions, or a potential Judicial Review could extend the programme, increase costs and impact achievement of the customer connection date.	National Grid will undertake early engagement with the LPA, statutory consultees, landowners and local communities, including public consultation planned for ahead of the planning application submission in . The application will be supported by robust environmental and technical assessments and managed through a proactive consenting strategy, including ongoing stakeholder engagement, early identification of secondary consent requirements, active management of planning conditions, and specialist planning and legal support to minimise determination delays and the risk of Judicial Review.
Customer Planning Approval (Programme): Delays in obtaining may impact the customer's ability to satisfy planning and NESO requirements within the required timescales. This could result in delays to key project milestones,	National Grid will maintain regular engagement with to monitor the progress of , programme milestones and emerging consenting risks. Key dependencies associated with the customer's planning approval and NESO requirements will be tracked through project governance and risk management processes. Ongoing engagement with and NESO will be maintained to ensure

Risk	Mitigation
increased development costs, and a postponement of transmission delivery activities. Prolonged delays or an unsuccessful determination could result in the scheme being rephased, deferred or cancelled, preventing the anticipated network and customer benefits from being realised.	emerging risks are identified early, allowing programme impacts to be assessed and mitigated where practicable. Where possible, National Grid will continue to progress development activities in parallel to reduce the impact of any delay in the customer's consent programme.
Transportation of Quad Boosters (Deliverability): There is a risk that a negative outcome from the CAT 3 bridge assessment identifies route constraints that prevent transportation of the Quad Booster equipment to the preferred Lower Frankton site. This could require the assessment of alternative installation locations, such as Shrewsbury, and result in programme delays, increased development and delivery costs, and additional engineering activities. A change in location may also necessitate revisions to the network design, Single Line Diagrams (SLDs), Substation Design Specifications (SDSs), protection systems and associated project documentation, with potential impacts on project scope, programme and cost.	Initial transport feasibility assessments, including a 3D route model, have returned a positive outcome, indicating that transportation of the Quad Booster equipment to the preferred site is achievable. To further validate the route, [redacted] has commissioned [redacted] to undertake a CAT 3 bridge assessment, with completion expected by the [redacted] Following completion, the assessment will be submitted to NMWTRA for review and approval. NGET will continue to engage with [redacted] NMWTRA and equipment suppliers throughout the assessment process to ensure any route constraints or mitigation requirements are identified and addressed at the earliest opportunity. Contingency options, including alternative installation locations and transport solutions, will be maintained and assessed in parallel to minimise any programme, cost or engineering impacts arising from an adverse assessment outcome.
Main Works contract award (Programme and Cost): Delays in contract award may result in a delayed onboarding of the delivery partner and subsequent delay to the commencement of scheme development and construction activities. Prolonged delays could increase project costs through extended development activities, resource retention and programme inefficiencies, and may impact the project's ability to achieve key delivery milestones.	Ongoing engagement will be maintained with the prospective contractor and Commercial teams to understand tendering priorities, resource availability and procurement constraints. Procurement milestones and contract negotiations will be proactively managed through project governance processes, with contingency delivery options considered where appropriate to minimise delays to contract award and project mobilisation.
Land Acquisition (Programme and Cost): Delays in securing the required land rights through [redacted] may prevent NGET obtaining possession of the land in line with the project programme. This could result in delays to design development, procurement and construction activities, increased land	[redacted] Property specialists and legal advisors will be engaged throughout the acquisition process to support negotiations and identify potential barriers to agreement at the earliest opportunity. Land acquisition progress will be regularly monitored through project governance, with programme assumptions reviewed

Risk	Mitigation
acquisition and project costs, and a delay to the commencement of site works. [redacted]	as negotiations develop. [redacted] Early preparation of supporting information will help minimise programme impacts should [redacted] be required.
Outages (Programme): Cancellation, shortening or amendment of pre-agreed outages may prevent the completion of planned construction and commissioning activities within the allocated outage window. This could result in programme delays until a suitable future outage can be secured, contractor downtime, and additional costs associated with the demobilisation and remobilisation of construction resources. Prolonged delays may also impact project delivery milestones and increase overall project costs.	Early engagement with System Access, Asset Operations and NESO will be maintained to identify, secure and manage outage requirements. Outage plans will be reviewed throughout project development, with programme contingencies and alternative work sequencing considered to minimise the impact of outage amendments or cancellations on project delivery.
Resource (Programme): Limited availability of NGET SAP and Commissioning resources may delay critical construction, outage and commissioning activities, resulting in programme delays, increased project costs, contractor compensation events and additional project management resource requirements. Prolonged delays may also impact planned outage windows and damage National Grid's reputation with customers and stakeholders.	Initial engagement with Asset Operations planning teams has been completed. Further detailed resource planning will be undertaken as the project develops to confirm SAP, Commissioning and outage requirements, with resource demand monitored through portfolio governance processes to identify and mitigate potential constraints before they impact project delivery

5. Conclusion

This submission outlines the preferred solution to satisfy the investment drivers. It seeks approval of the needs case, optioneering and preferred solution.

The preferred option, E-3, comprises a new [redacted] bay 400/132 kV AIS substation at Lower Frankton. Following a comprehensive options assessment, siting study and subsequent reassessment, E-3 was identified as the preferred solution as it meets current connection requirements while providing capacity for identified future network and customer drivers. By incorporating this capacity within the initial development, the option reduces the need for future extension works, delivering greater operational flexibility, reduced delivery risk and improved long-term value for consumers in line with Ofgem's PASE principles.

Table 16: Submission summary

Submission summary	
Main drivers	Connection of contracted customers, identified future network requirements including UWNC and MWNC/1, NESO-led network reinforcement (Quad Boosters), and future generation customers.
Preferred option	E-3: New [redacted] bay 400/132 kV AIS substation providing capacity for contracted connections and identified future network requirements, reducing the likelihood of future extension works and associated disruption.
Estimated cost and timing	Estimated cost is [redacted] inc. risk and contingency (2023/24); energisation targeted for [redacted] subject to planning and land acquisition.
Outputs	A new [redacted] bay 400kV AIS substation, [redacted] 460MVA transformers and 132kV CSEs at the standard connection boundary, with busbar infrastructure installed across all bays to facilitate capacity for identified future network requirements, and associated reinforcement works including power flow control.
Proposed PCD	[redacted] delivery and energisation of a new [redacted] bay 400/132 kV AIS substation at Lower Frankton, including associated enabling works and capacity to facilitate identified future network requirements.

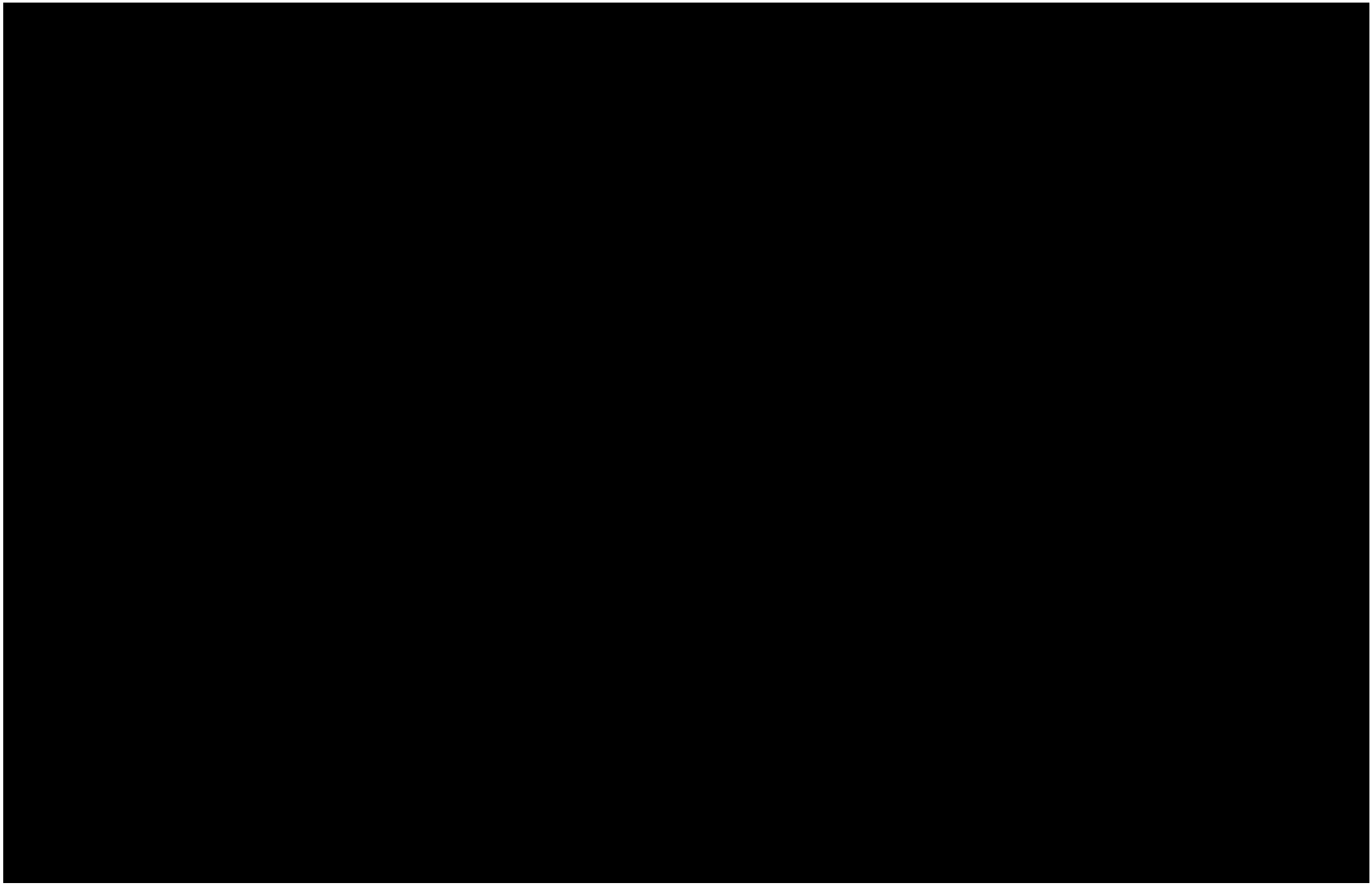
Appendix A
Glossary

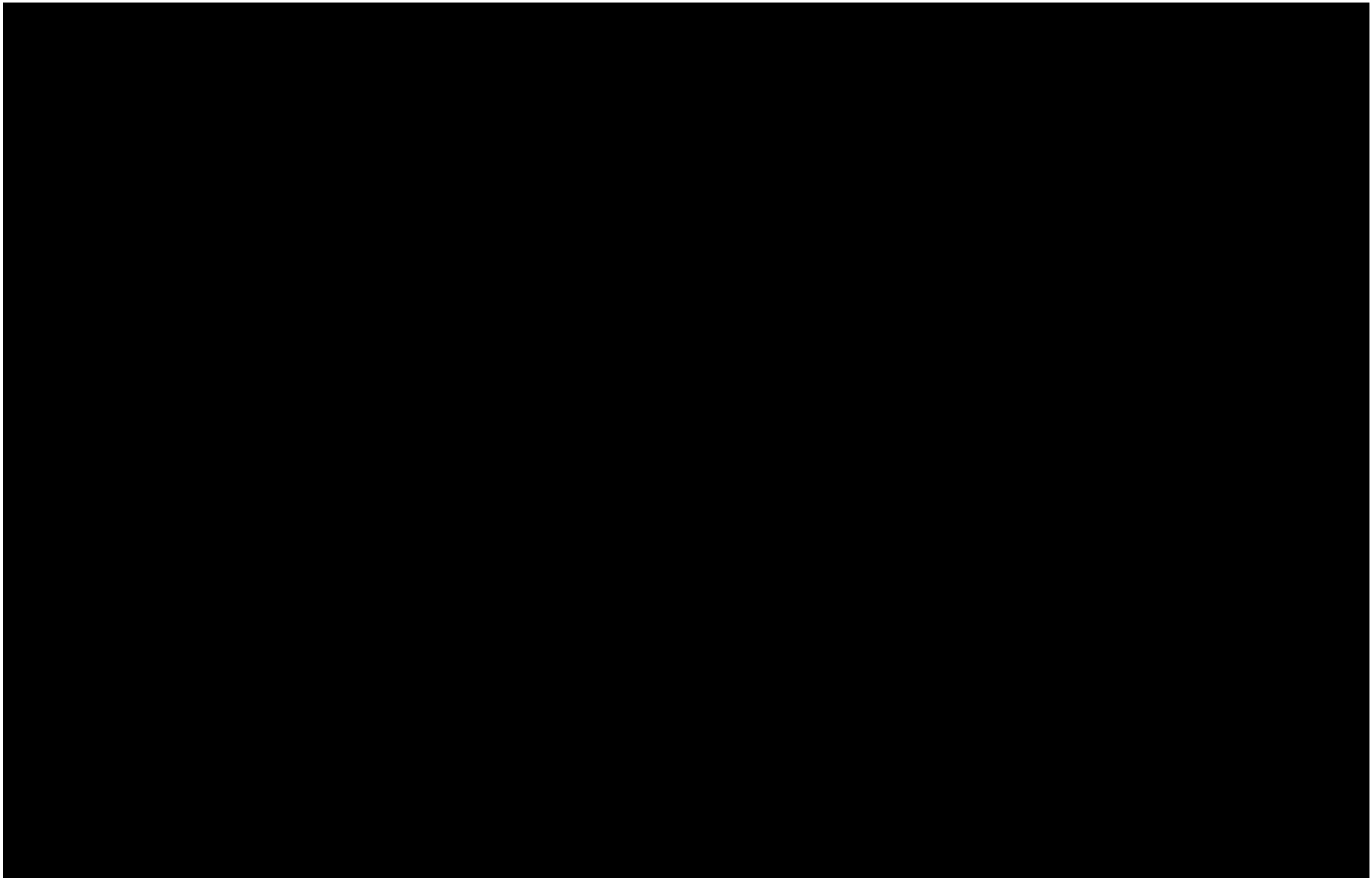
Table 17: Table of abbreviations and definitions

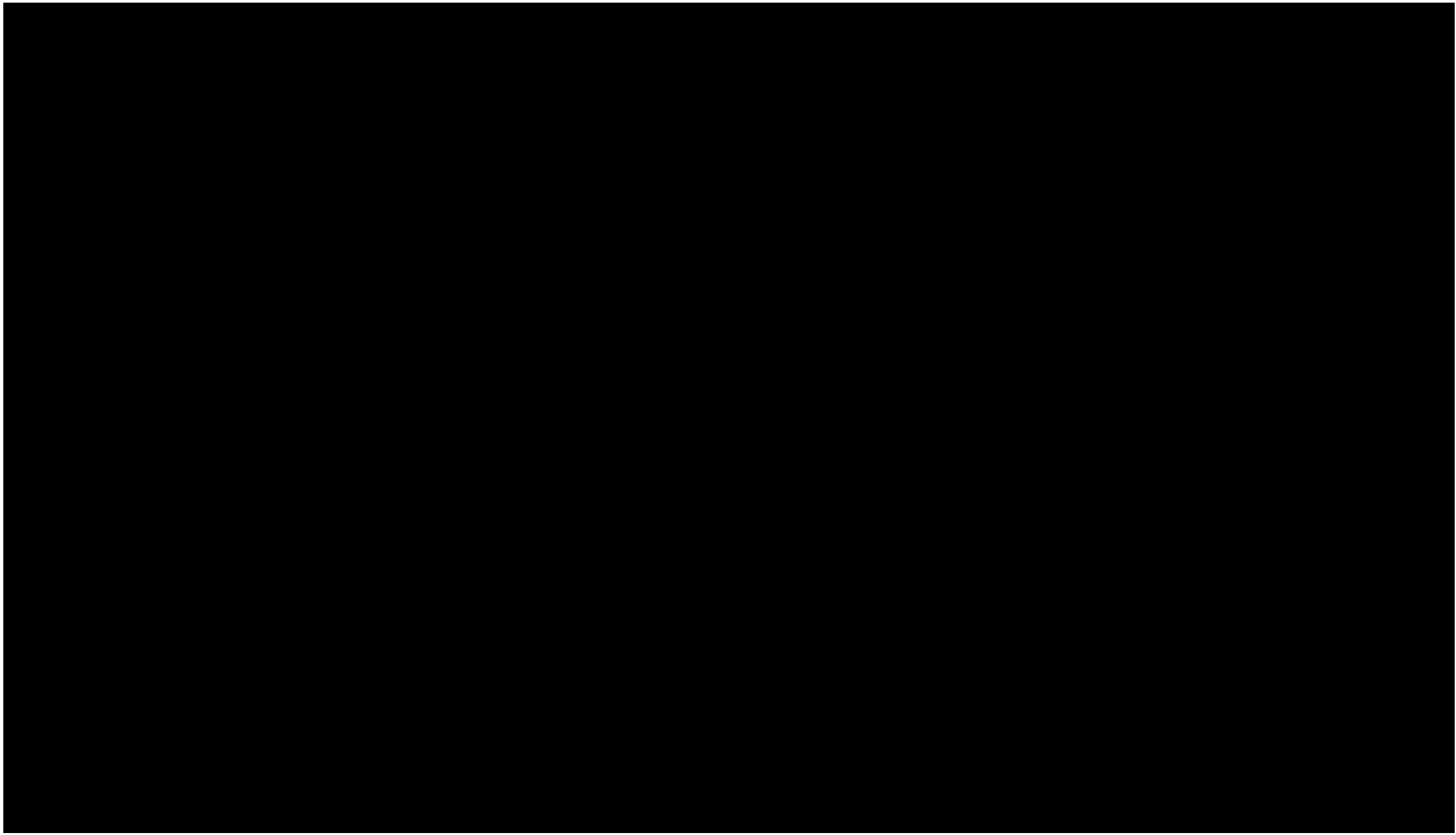
Abbreviation	Description
ACE	Advanced Commissiong Engineer
ACL	Available For Commercial Load
ACSR	Aluminium Core Steel Reinforced
AIS	Air Insulated Switchgear
APM	Advanced Procurement Mechanism
BESS	Battery Energy Storage System
BP	Business Plan
BPDT	Business Plan Data Template
CAI	Closely Associated 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	Disconnector
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

Abbreviation	Description
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
IEC	International Electrotechnical Commission
kW	Kilo Watt
LLTI	Long Lead Time Items
LTDS	Long-Term Development Statement
LV	Low Voltage
LVAC	Low Voltage Ac
M&E	Mechanical And Electrical
MITS	Main Interconnected Transmission Systems
MSIP	Medium Sized Investment Project
MVA	Megavolt-Amperes
MW	Mega Watt
NESO	National Energy System Operator
NETS	National Electricity Transmission System
NG	National Grid
NGED	National Grid Electricity Distribution
NGET	National Grid Electricity Transmission

Abbreviation	Description
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
SAP	Senior Authorised Person
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
XLPE	Cross-Linked Polyethylene







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