nationalgrid

Connah's Quay–Legacy–Trawsfynydd 1 & 2, Ironbridge–Legacy–Shrewsbury and Ironbridge–Legacy 2 OHL

Eligibility Letter Summary

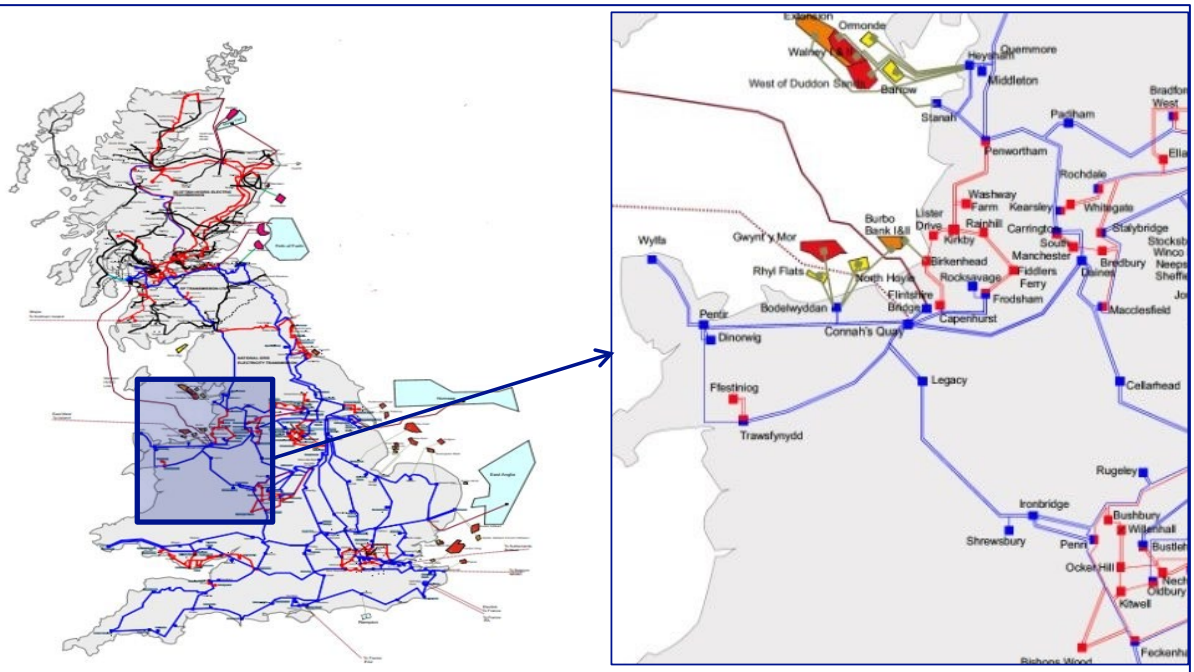
National Grid Electricity Transmission
Eligibility Letter

October 2026

1. Background

This investment will reconductor the two interrelated but distinct circuits. Connah's Quay–Legacy–Trawsfynydd 1 and 2 (ZK/ZKA) and Ironbridge–Legacy–Shrewsbury / Ironbridge–Legacy 2 (ZZJ/ZZK) 400 kV overhead line circuits in North Wales. The works comprise replacement of the existing conductors, renewal of associated fittings and optical ground wire, and strengthening of foundations and steelwork where required. The investment will increase transmission capability to facilitate customer connections and demand growth.

Figure 1: Proposed location of investment on our network



*Key: **Red** = 275 kV assets, **Blue** = 400 kV assets.*

This Eligibility Letter is being submitted as part of the RIIO-ET3 Load Re-opener (LR) mechanism under Special Condition 3.18 (Load Re-opener and Price Control Deliverable) of the Electricity Transmission Licence Conditions. This submission is requesting Ofgem's confirmation of the project's Track 2 assignment, as set out in its RIIO-ET3 Final Determinations, and confirmation of the needs case and preferred solution.

2. Investment Drivers

The primary driver is the facilitation of aggregated customer connections. A pipeline of 3.03 GW of Gate 2 Phase 1 customers by 2030, and a further 5.06 GW of Gate 2 Phase 2 customers by 2035, is dependent on reinforcement of these circuits.[1] Network studies undertaken using NESO's Connections Reform planning background identified thermal constraints on the affected circuits and established a requirement for approximately 2,730 MVA summer pre-fault capability, or 3,325 MVA winter post-fault capability. The investment also aligns with the wider programme of regional

[1] The customer connection pipeline has been refined through Connections Reform. As part of this process, projects that did not meet the required progression criteria were reassigned to Gate 1, removing less mature projects from the near-term connection background. The remaining projects (Gate 2, which is split into Phases 1 and 2) therefore represent the current view of the most credible and deliverable customer connections.

reinforcement in North Wales, supporting coordinated development of the transmission network to accommodate connection-driven growth across the region.

Asset health is not a key driver. However, delivery of the preferred solution will provide associated renewal benefits.

3. Options

We undertook a structured, multi-factor optioneering process to identify a proportionate and deliverable solution in the interests of consumers. For each circuit, a total of **19 longlist options** were assessed across six strategic categories: do nothing, market-based solutions, whole-system solutions, making use of existing assets, reconductoring and new overhead line.

From the longlist, we **shortlisted options E-4 and E-11** following a high-level assessment against balanced scorecard criteria (see table below): reconductor using conductor D or conductor E. Options were discounted from the longlist where they could not meet the required rating, were not type-registered at the point of the investment decision, presented insufficient cost or supply-chain confidence, or introduced compatibility or compliance concerns.

Although Option E-4 (Conductor D) falls marginally short of the capability requirement, it was retained as the closest technically credible alternative to Option E-11, providing a proportionate comparator for the detailed value assessment.

For the ZK/ZKA route, the assessment considered conductors across both L2 and L6 tower types i.e. two conductors per option.

Table 1: Summary of longlist options assessment for both routes

Option	Details	Shortlist?	Preferred?
A	Do nothing counterfactual option	No – cannot provide required uprating	
B	Market-based solution	No – cannot provide required uprating	
C	Non-transmission, whole systems	No – cannot provide required uprating	
D-1	Hotwiring	No – cannot provide required uprating	
D-2	Dynamic line rating	No – cannot provide required uprating	
D-3	Quad booster	No – cannot provide required uprating	
D-4	Series reactors	No – cannot provide required uprating	
Reconductoring Options			
E-1	Reconductor to Conductor A	No – does not meet the capability requirement	
E-2	Reconductor to Conductor B	No – type registration withdrawn	
E-3	Reconductor to Conductor C	No – insufficient maturity and type registration	
E-4	Reconductor to Conductor D	✓	
E-5 to E-10	Alternative conductor solutions	No – capability, compatibility or compliance limitations.	
E-11	Reconductor to Conductor E	✓	✓
F	New Overhead Line Circuit	No – cannot provide required uprating in time and costly to consumers	

4. Qualitative Trade-offs Between the Shortlisted Options

The table below sets out the qualitative trade-offs between the two shortlisted options, which apply to both routes.

For the ZK/ZKA route, the assessment considered conductor solutions for both L2 and L6 towers. However, as the preferred conductor solution for the L6 towers is the same across the shortlisted options, the comparative assessment and shortlisting outcome were **principally driven by the shortlisted L2 tower conductors**. In contrast, the ZZJ/ZZK route comprises only L2 towers and therefore only a single conductor solution was considered for each shortlisted option.

Table 2: Qualitative trade-offs between the shortlisted options

Criteria	Option E-4: Conductor D (L2)	Option E-11: Conductor E (L2)
Engineering	**Detractor.** Delivers approximately 2,690 MVA and falls short of the required capability.	**Benefit.** Delivers approximately 2,740 MVA and meets the required capability.
Environmental	**Detractor.** Higher losses and associated carbon impacts.	**Neutral.** Similar environmental profile, although with lower losses than Conductor D.
Deliverability	**Neutral.** Limited deployment history and single-supplier dependency.	**Benefit.** Greater operational familiarity. Additional suppliers are progressing through type registration, providing a route to broader future supply.
Economic / consumer value	**Detractor.** Higher conductor and installation costs.	**Benefit.** Lower capital cost and stronger consumer value outcome.
Consenting / stakeholder	**Detractor.** Additional temporary laydown requirements associated with ACC conductor installation.	**Benefit.** Standard installation arrangements with no material additional stakeholder impacts.

5. Quantitative Trade-offs Between the Shortlisted Options

The tables below express the position of Option E-4 relative to Option E-11 across both routes. The cost-book estimates reflect our view at the time of optioneering and allow a like-for-like comparison of the shortlisted options. To maintain a competitive tender process and, in turn, protect consumer value, we have anonymised conductor supplier names and presented the values as ratios only. Ratios are calculated within each route using Option E-11 as the 1.00 baseline.

For interpretation of Tables 3 and 4, Option E-11 is set as the 1.00 baseline for each route. The cost-book estimate, total capital cost, and undiscounted carbon and losses cost ratios are direct cost comparisons, such that a value above 1.00 indicates that Option E-4 is more costly and a value below 1.00 indicates that it is less costly. As the NPVs are negative, the NPV ratio instead reflects relative economic performance: a value below 1.00 indicates that Option E-4 has a lower, more negative NPV and therefore performs less favourably than Option E-11. A useful economic life ratio of 1.00 indicates equivalence between the options.

Table 3: Quantitative trade-offs between the shortlisted options - ZK/ZKA route

Measure	Option E-11: Conductor E (L2) + Conductor X (L6)	Option E-4: Conductor D (L2) + Conductor X (L6)
Cost-book estimate	1	1.26
Total capital cost over the 50-year appraisal period, including replacement	1	1.33

Net present value (NPV)	1	0.82
Undiscounted carbon and losses costs	1	0.97
Useful economic life	1	1

Table 4: Quantitative trade-offs between the shortlisted options - ZZJ/ZZK route

Measure	Option E-11: Conductor E (L2)	Option E-4: Conductor D (L2)
Cost-book estimate	1	1.48
Total capital cost over the 50-year appraisal period, including replacement	1	1.48
Net present value (NPV)	1	0.73
Undiscounted carbon and losses costs	1	0.97
Useful economic life	1	1.00

For ZK/ZKA: Option E-11 is approximately 21% lower cost than Option E-4 based on the initial cost-book estimate. This cost advantage increases over the asset life, with Option E-11 delivering around 25% lower whole-life capital costs and an approximately 18% improvement in NPV. Option E-4 has marginally lower aggregate undiscounted carbon and transmission loss costs, driven by lower construction carbon costs, while Option E-11 has lower transmission loss costs. Both options provide an equivalent useful economic life.

For ZZJ/ZZK: Option E-11 is approximately 33% lower cost than Option E-4 based on the initial cost-book estimate. This cost advantage is maintained over the asset life, with Option E-11 delivering around 33% lower whole-life capital costs and an approximately 27% improvement in NPV. Option E-4 has marginally lower aggregate undiscounted carbon and transmission loss costs, driven by lower construction carbon costs, while Option E-11 has lower transmission loss costs. Both options provide an equivalent useful economic life.

6. Preferred Solution

Based on the qualitative and quantitative assessment of the shortlisted options, **Option E-11 is the preferred solution across both routes** because:

- It is the only credible shortlisted option capable of meeting the identified minimum capability requirements.
- It provides the strongest consumer value outcome, with lower capital costs, lower whole-life costs and higher NPVs than the shortlisted alternative.
- It aligns with PASE principles by using the highest-rated technically feasible conductor solution available for the existing tower configurations.
- It benefits from established installation, operation and maintenance practices