nationalgrid

Elvanfoot – Harker OHL (EHRE)

Eligibility Letter Summary

National Grid Electricity Transmission
Eligibility Letter

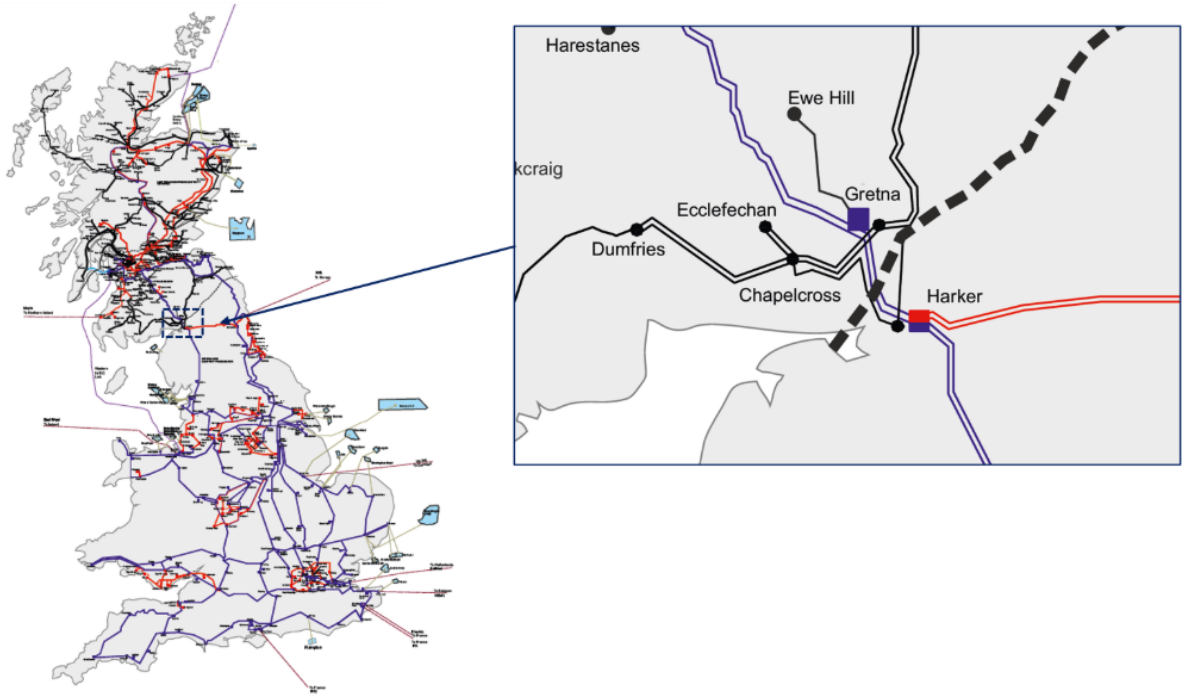
October 2026

1. Background

This investment will deliver the additional Harker cable, and interface works needed to realise the RIIO-ET3 Baseline Submission approved Elvanfoot (Gretna)–Harker and Harker–Moffat 400kV overhead-line uprating. The preferred solution diverts Gretna into the new Harker gas-insulated switchgear (GIS) substation and adds a third cable run per phase to the Moffat connection.

EHRE supports north-to-south power transfers across the B6 boundary between Scotland and England. Subsequent detailed design identified that the planned Harker cable arrangement would limit the uprated circuits, preventing delivery of the approved network output. The scope of this submission is for the incremental Harker Cable works required to mitigate the limiting factor identified.

Figure 1: Proposed location of investment on our network



*Key: **Red** = 275kV assets, **Blue** = 400kV assets. Investment location shown in **green** box.*

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 approval of project eligibility against the Load Re-opener criteria and seeks approval of the project's needs case and preferred solution. This submission further requests confirmation that the project should proceed via Track 2 and seeks Pre-Construction Funding (PCF) under Special Condition 3.15 (Pre-Construction Funding Re-opener, Price Control Deliverable).

2. Investment Drivers

The primary driver is NESO's requirement for approximately 400MW of additional B6 transfer capability by 2030. EHRE increases the circuits' winter post-fault rating from approximately 2,210MVA to 3,100MVA. The planned Harker cable arrangement is rated at approximately 2,170MVA and must be uprated to avoid constraining that output. Energisation is targeted for December 2029.

The need is network-led, supporting increased renewable generation transfers rather than a specific new customer connection. Asset health provides an additional efficiency opportunity: associated fittings can be replaced alongside the load-related works, reducing future standalone interventions and outages. No separate asset-health funding is sought.

3. Options

We undertook a structured, multi-factor optioneering process to identify a proportionate and deliverable solution in the interests of consumers. We identified eight longlist options within five strategic categories: do nothing, market-based, non-transmission whole-system, making use of existing assets and new infrastructure.

The assessment is limited to the incremental Harker interface; it does not reopen the approved need or baseline-funded overhead-line solution. Options E-2 and E-3 were shortlisted following assessment of engineering, environmental, deliverability, consumer-value and consenting considerations. No separate siting study was needed because the works must connect the existing circuits to the new Harker substation.

Table 1: Summary of longlist options assessment

Option	Details	Shortlist?	Preferred ?
A	Do nothing counterfactual	No – leaves the Harker constraint and prevents the approved output	
B	Market-based solution	No – does not provide an enduring capacity increase	
C	Non-transmission, whole-system solution	No – no viable alternative delivers the required boundary capability	
D	Retain the existing two-cable-runs-per-phase design	No – thermal and route constraints prevent the required rating	
E-1	Extend gas-insulated busbar (GIB) to both existing gantries	No – long routes, road crossings, access and security constraints	
E-2	Divert both Gretna and Moffat into the new GIS through overhead-line and GIB interfaces	Yes	
E-3	Divert Gretna through overhead line and GIB; retain and uprate the Moffat cable connection	Yes	Yes
E-4	Connect both circuits to existing gantries through combined GIB and cable links	No – cable congestion, complex interfaces and poorer consumer value	

Both shortlisted options provide compliant interfaces and allow substantial construction away from operational circuits, without simultaneous outages of Gretna and Moffat. Option E-3 also aligns the

final Moffat cable arrangement with the planned Harker works, reducing rework and additional system access.

4. Qualitative Trade-offs Between the Shortlisted Options

The table below sets out how the two shortlisted options compare against the balanced scorecard criteria used in our qualitative assessment.

Table 2: Qualitative trade-offs between the shortlisted options

Criteria	Option E-2	Option E-3
Engineering	**Neutral.** Provides established overhead-line and GIB interfaces for both circuits and avoids constrained cable installation. Two overhead-line circuits create clearance challenges in the tight layout.	**Neutral.** Retains the Moffat overhead-line route and existing ZV towers, while uprating the cable interface. Cable crossings within the substation increase layout and maintenance complexity.
Environmental	**Detractor.** Works are close to Harker Moss Nature Reserve and involve temporary use of an existing tower.	**Benefit.** The limited Gretna diversion retains Harker Moss, avoids woodland nature reserves and limits environmental and landowner effects.
Deliverability	**Detractor.** Much of the construction can take place offline, but temporary diversion and outage sequencing require more system access than E-3.	**Benefit.** Moffat cable works can proceed with Gretna in service. Integrating the final arrangement with Harker reduces repeat construction and outages, although existing cable diversions and coordinated outages remain necessary.
Economic / consumer value	**Benefit.** Further design optimisation is possible, but the option costs more and would leave 12 previously procured cable lengths surplus, risking avoidable expenditure if they cannot be reused or reallocated.	**Strong benefit.** Lower capital and whole-life costs, less GIB and civil infrastructure, and use of the planned Moffat cables. Programme integration reduces rework and delivery complexity.
Consenting / stakeholder	**Detractor.** New towers and gantries require statutory consent, planning approvals and updated land rights. The temporary diversion crosses third-party land.	**Detractor.** Similar consent and third-party land requirements. One new tower is on land consented for a battery-storage development; early engagement confirms the location would not prevent that development, but land rights remain to be secured.

Land and consenting risks are broadly comparable and did not determine the preference. E-3 provides the stronger overall outcome through lower cost and better integration with Harker. Its mixed overhead-line, GIB and cable arrangement is not a defined PASE solution; the submission justifies this targeted departure through compatibility with the new GIS substation and the constrained site.

5. Quantitative Trade-offs Between the Shortlisted Options

The table below expresses the position of Option E-2 relative to Option E-3. The cost-book estimates reflect our view at the time of optioneering and allow a like-for-like comparison of the shortlisted options. To ensure we can maintain a competitive tender process and in turn protect consumer value, we have anonymised supplier names and have only provided cost ratios.

Table 3: Quantitative trade-offs between the shortlisted options

Measure	Option E-2	Option E-3
Cost-book estimate (£m)	1.73	1
Total capital cost including replacement (£m, undiscounted)	1.73	1
Net present value (£m, discounted)*	1.73	1
Construction carbon cost (£m, undiscounted)	1.84	1
Electrical losses comparison	Not separately reported	Not separately reported
Asset-life / replacement comparison	Replacement assumed at 40 years	Replacement assumed at 40 years

* *Parentheses denote negative values as reported. A less negative NPV is better. The common 40-year replacement assumption is not a separately evidenced asset-life comparison.*

Option E-3 is around 73% more economical than E-2 based on the initial cost-book estimate. It requires less gas-insulated equipment and associated civil infrastructure while delivering the required interface capacity. The source assumes cable costs are delivered through Harker Energy Enablement and excludes them from these option estimates; the comparison should therefore not be read as a standalone estimate of all cable expenditure.

6. Preferred Solution

Based on the qualitative and quantitative assessment, **Option E-3** is the preferred solution because:

- **Consumer value:** it has the lowest capital cost and strongest NPV, with less GIB equipment and associated civil works.
- **Deliverability:** it integrates the final Moffat cable arrangement into the planned Harker works, reducing repeat construction and outages while allowing Gretna to remain in service.
- **Futureproofing:** the Moffat cable system is designed for 3,380MVA, supporting the approved 3,100MVA requirement and potential higher-rated conductor technology, subject to technical assessment and type registration.
- **Environmental considerations:** the limited Gretna diversion retains Harker Moss and avoids woodland nature reserves; reported construction carbon costs are lower than E-2.
- **Stakeholder considerations:** it aligns with the Harker programme and retains existing infrastructure. Comparable land and consenting requirements remain to be resolved.
- **Strategic benefits:** it removes the Harker bottleneck so the approved EHRE reinforcement can support increased north-to-south renewable power transfers.