nationalgrid

Uprating Tilbury – Warley to 400kV

Eligibility Letter Summary

National Grid Electricity Transmission
Eligibility Letter

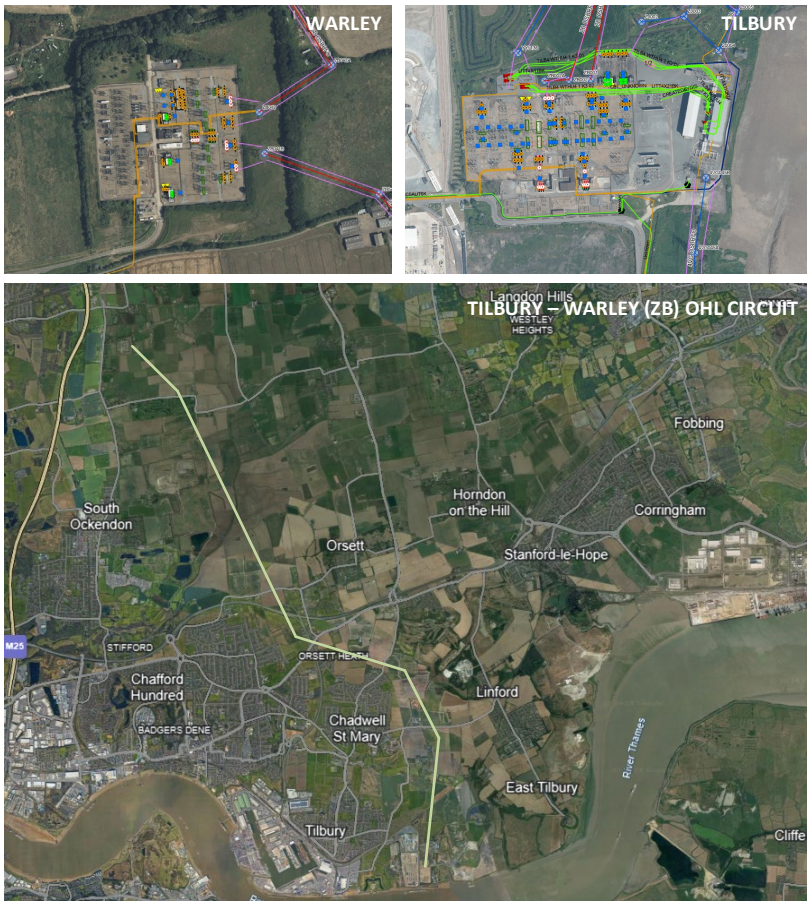
October 2026

1. Background

This investment will uprate the 14km Tilbury – Warley overhead line (OHL) circuit in Greater London from 275kV to 400kV. It will reconductor both circuits on the existing route and renew the associated fittings, steelwork and OHL components, enabling the connection of customers at Tilbury and Warley, and enabling the boundary uplift set out in NESO's TWNC project. Asset health is an additional secondary driver for this investment.

Greater London consumes around a fifth of the nation's electricity, and demand is rising as transport and heating are electrified and major data centres are developed. With limited large-scale generation within London, the capital relies on the transmission network to import power, placing growing pressure on the outer network that supplies it. This investment is being developed alongside other projects in the area and wider reinforcement of the outer London network to avoid duplication and reduce overall system costs.

Figure 1: Location of proposed investment on our network



This Eligibility Letter is being submitted as part of the RIIO-ET3 Load Re-opener (LR) mechanism.[1] This submission requests Ofgem's approval of project eligibility and seeks acceptance of the investment need, the optioneering completed to date and the shortlist of options we will take forward to detailed analysis. This submission further requests Pre-Construction Funding (PCF) and

[1] Under Special Condition 3.18 (Load Re-opener and Price Control Deliverable) of the Electricity Transmission Licence Conditions.

confirmation that the project should proceed as a Track 3 project.[2] Our preferred solution will be confirmed in our Needs Case submission.

2. Investment Drivers

The primary driver is customer connections. Around 1.5GW of new demand is forecast to connect at Tilbury, and around 1.9GW at Warley.[3] The Tilbury-Warley OHL must be capable of operating at 400kV. Without this uprating, the circuit would overload under forecast network conditions and would not meet the required safety standards. The uprating is also needed to enable an increase in the capacity to transfer power into London across the LE1 boundary.

3. Options

We undertook a structured, multi-factor optioneering process to identify a proportionate and deliverable solution in the interests of consumers. We first identified **11 longlist options** within six strategic option categories: do nothing, market-based, non-transmission whole-system, making use of existing assets, reconductoring, and a new OHL.

Our original optioneering, submitted with our RIIO-T3 business plan in December 2024, preferred Option E-2. We subsequently withdrew this as a preferred option due to a complication with the conductor. We re-evaluated our options in 2026: from the longlist, we **shortlisted options E-1, E-3, E-4 and E-5** following a high-level assessment against balanced scorecard criteria (see table 1).

Options A to D were rejected because they could not provide the required capacity or would cause overloads elsewhere on the network. Option E-2 was rejected because its conductor is no longer type registered. Option F was rejected because a new line would delay delivery and would have the greatest cost to consumers.

Table 1: Summary of longlist options assessment

Option	Details	Shortlist?[4]
A	Do nothing counterfactual option	No – cannot meet the investment drivers
B	Market-based solution	No – cannot meet the investment drivers
C	Non-transmission, whole systems	No – cannot meet the investment drivers
D-1	Quadrature booster	No – does not add capacity; would overload other circuits
D-2	Series reactor	No – does not add capacity; would overload other circuits
E-1	Reconductor to Conductor A (at 170°C)	✓
E-2	Reconductor to Conductor B (at 150°C)	No – lack of type registration
E-3	Reconductor to Conductor C (at 190°C)	✓
E-4	Reconductor to Conductor C (at 210°C)	✓

[2] Under Special Condition 3.15 (Pre-Construction Funding Re-opener, Price Control Deliverable) of the Electricity Transmission Licence Conditions.
[3] 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.
[4] A revised System Design Specification produced in July 2026 confirmed that the circuit must achieve a higher rating than originally assessed. On this basis, only Options E-4 and E-5 can meet the required rating.

Option	Details	Shortlist?[4]
E-5	Reconductor to Conductor D (at 210°C)	✓
F	New OHL circuit	No – could not be delivered without delay; highest cost

4. Indicative Qualitative Trade-offs Between the Shortlisted Options

The table below sets out how the four shortlisted options compare against the balanced scorecard criteria used in our qualitative assessment. These findings remain indicative and will be confirmed in our Needs Case submission.

Table 2: Indicative Qualitative trade-offs between the shortlisted options

Criteria	Option E-1: Conductor A (170°C)	Option E-3: Conductor C (190°C)	Option E-4: Conductor C (210°C)	Option E-5: Conductor D (210°C)
Engineering	**Detractor.** Does not meet the required rating. Addresses asset health.	**Detractor.** Does not meet the required rating. Addresses asset health.	**Benefit.** Meets the required rating. Addresses asset health.	**Benefit.** Exceeds the required rating. Addresses asset health.
Environmental	**Benefit.** Lower transmission losses and carbon emissions than Conductor C.	**Detractor.** Higher transmission losses and carbon emissions than the alternatives.	**Detractor.** Higher transmission losses and carbon emissions than the alternatives.	**Benefit.** Expected to have lower transmission losses and carbon emissions than Conductor C.
Deliverability	**Benefit.** Widely used on our network, with a mature supply chain and established installation methods.	**Neutral.** Limited operational precedent on our network and a more complex installation, supported by limited industry expertise.	**Neutral.** Limited operational precedent on our network and a more complex installation, supported by limited industry expertise.	**Detractor.** Based on established technology, but limited operational deployment. Residual programme and delivery risk over A.
Economic / consumer value	**Benefit.** Lower capital cost and lower losses than Conductor C. Supports timely connection of customers.	**Detractor.** Higher material and capital costs than the alternatives, and higher whole-life costs due to increased losses.	**Detractor.** Higher material and capital costs than the alternatives, and higher whole-life costs due to increased losses.	**Benefit.** Lower capital cost and lower losses than Conductor C. Supports timely connection of customers.
Consenting / stakeholder	No significant difference between the options in the qualitative assessment. **Neutral.** All options are delivered on the existing route, so no new planning consent is required. Existing land rights will need updating for 400kV operation, and construction must be coordinated with the Lower Thames Crossing and other works in the area.			

5. Indicative Quantitative Trade-offs Between the Shortlisted Options

The table below expresses the position of the different shortlisted options relative to Option E-5. 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 conductor supplier names and have only provided cost ratios.

Table 3: Indicative Quantitative trade-offs between the shortlisted options

Measure	Option E-1: Conductor A (170°C)	Option E-3: Conductor C (190°C)	Option E-4: Conductor C (210°C)	Option E-5: Conductor D (210°C)
Cost-book estimate	1	1.42	1.42	1
Total capital cost over the 50-year appraisal period, including replacement	1	1.42	1.42	1
Net present value (cost)*	0.98	1.30	1.30	1
Undiscounted carbon and losses costs	0.86	0.83	0.84	1

**Lower is better*

Options E-1 and E-5 have very similar costs. Options E-3 and E-4 are around 42% more expensive on the initial cost-book estimate and carry around 30% higher net present cost. Some options sit above the £40m load re-opener threshold and some sit below this.

6. Preferred Solution

Due to the current stage of project development, we do not yet have a preferred solution. However, based on our indicative qualitative and quantitative assessment of the shortlisted options, Option E-5 is provisionally the strongest performing option. However, there is a key dependency with the conductor type. Option E-4 does not have this dependency, but has higher cost, losses and supply chain risk.

Selection of our final preferred solution is subject to further internal review and will be confirmed in our subsequent Needs Case submission.

If our preferred solution has a total forecast expenditure that remains below the Load Re-opener threshold, we will cease progression through the Load Re-opener and seek an alternative funding route through the relevant price control mechanism.