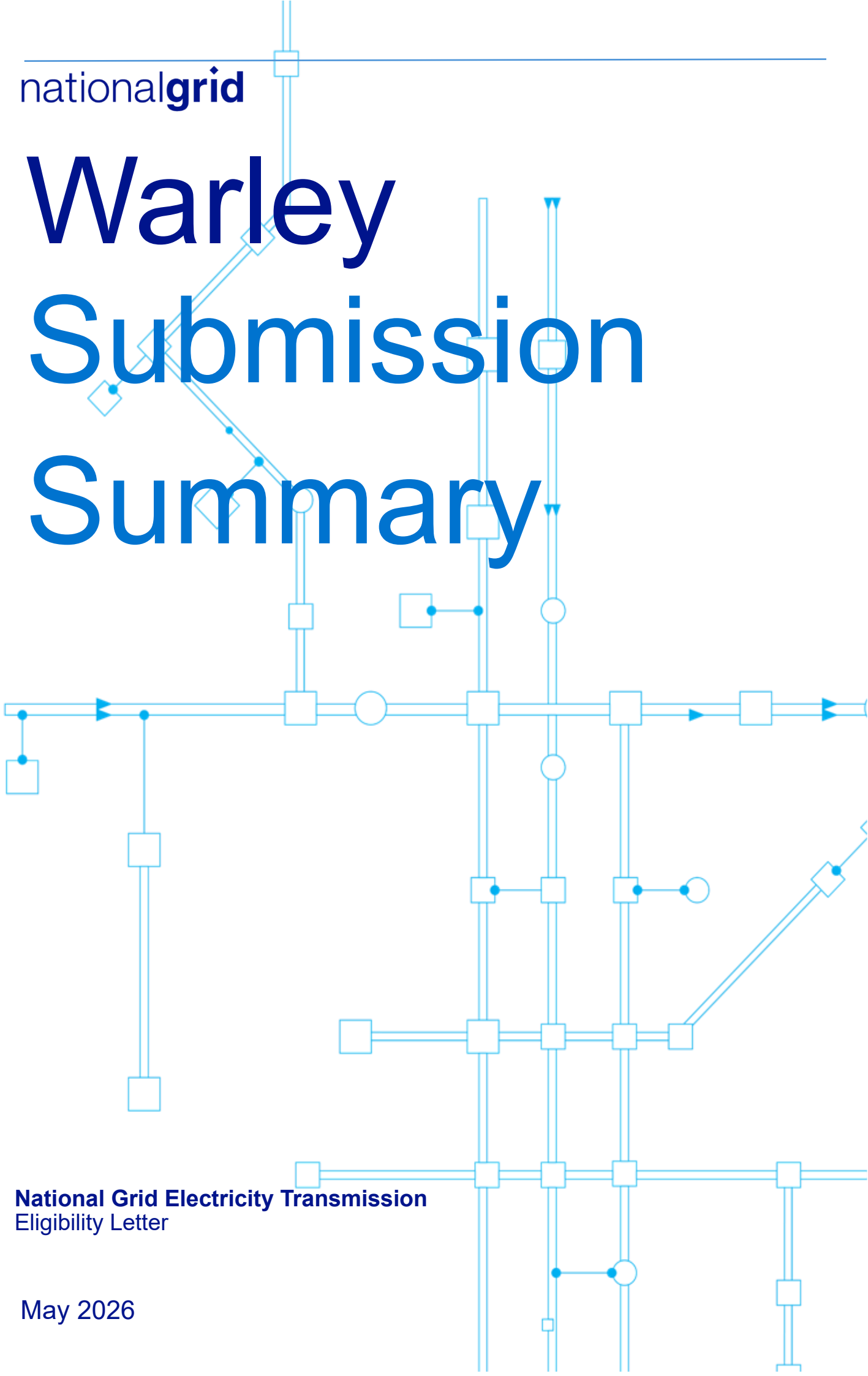


nationalgrid

Warley Submission Summary



National Grid Electricity Transmission
Eligibility Letter

May 2026

T3 – Warley 275kV Substation Replacement

Executive Summary

Background

The investment comprises the replacement of the existing Warley 275kV substation with a new 400kV substation to support growing demand and address ageing infrastructure. The existing site, operational since 1965, is at capacity and constrained in footprint.

The proposed solution forms part of a wider regional strategy to reinforce the transmission network in the London East area, including enabling the uprating of the network from 275kV to 400kV. This aligns with system requirements identified by the National Energy System Operator (NESO), particularly the Tilbury–Waltham Cross (TWNC) reinforcement.

The investment is also required to facilitate contracted customer connections, including a DNO and multiple direct and embedded customers, which cannot be delivered using the existing infrastructure.

Investment Drivers

The primary drivers for investment are:

Customer connections

- Requirement to connect a DNO and multiple contracted customers (including demand and generation).
- Existing site is unable to accommodate additional connections due to capacity and configurational constraints.

System reinforcement (NESO)

- Requirement to enable the TWNC project, including uprating the network from 275kV to 400kV.
- Supports increased transfer capability and system resilience in a high-demand region.

Without this investment, NGET would not be able to meet its connection obligations or deliver critical regional reinforcement.

Options

A structured optioneering process was undertaken, considering:

- Strategic options
 - Do nothing
 - Market-based and whole system solutions
 - Utilising existing assets
 - New build solutions

Options that did not enable connections or meet licence obligations were discounted early.

- Design and siting options
 - Assessment of 275kV vs 400kV solutions
 - AIS vs GIS technologies
 - OHL vs cable connections
 - Eight potential sites considered, with three shortlisted
- Shortlisted options
 - Option E5: 400kV AIS substation with OHL connections

- Option E7: 400kV GIS substation with OHL connections
- Option E8: 400kV AIS substation with OHL connections and OHL diversion

Preferred Solution

The preferred solution is Option E7, a new 400kV double busbar GIS substation located immediately south of the existing Warley substation. Connection via overhead lines with relocation of existing circuits.

Key benefits of the preferred solution include:

Deliverability and consenting

- Smaller footprint reduces impact on greenbelt land and improves likelihood of obtaining planning consent.
- Lower risk of programme delay compared to AIS options.

Environmental and community impact

- Reduced land take and earthworks.
- Lower construction-related emissions
- Reduced disruption due to fewer vehicle movements

Construction and safety

- Improved construction safety due to more efficient site layout and reduced oversailing risks.
- Simpler and shorter construction programme.

System capability and future flexibility

- Enables required customer connections and NESO-driven upgrades.
- Provides space for future expansion and evolving system needs.

Cost

- Lower overall cost relative to alternative shortlisted options.

The solution delivers all required outputs, including new transformation capacity and infrastructure to connect customers and support regional network upgrading. The detailed design may evolve in response to connections reform and system requirements, but this does not change the preferred option.