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National Grid Electricity Transmission



National Grid Electricity Transmission (NGET) sits at the heart of our energy system, connecting millions of people and businesses to the energy they use every day.

Every time a phone is plugged in, or a switch turned on, we have played a part in connecting you to the energy you need.

We deliver electricity safely, reliably and efficiently to the customers and communities we serve.

We are working towards building a secure, cleaner and more affordable energy system for the future, investing over £30 billion by 2031.



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The Great Grid Upgrade

Demand for electricity is set to double by 2050 as the way we power our homes, businesses, industry and transport changes. We need to upgrade the grid now to meet this increase in demand.

The existing transmission network, including the current Aberthaw substations, was largely built decades ago.

It was not designed to transport electricity from where it is increasingly being generated today.



The Great Grid Upgrade is the largest overhaul of the grid in generations and supporting the transition to a clean and more affordable energy future.

The Great Grid Upgrade will:

Contribute to lower energy bills over the long term and make the UK's energy more self-sufficient.

Support over 220,000 jobs each year between 2024 and 2035.

For more information about The Great Grid Upgrade, please visit: **nationalgrid.com/the-great-grid-upgrade**

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Connecting to the Grid

National Grid Electricity Transmission owns and manages the high voltage transmission network.

We are legally required to connect new customers - solar farms, wind farms, battery storage systems, data centres - to the grid.

The National Energy System Operator (NESO) is the independent system operator and planner for Great Britain's energy networks.



Requests for connections go through the following process:

1
The developer submits an application to the NESO

2
If the application is accepted, NESO agrees a connection contract and date

3
NESO then passes the project to us to take forward

4
We assess the project and identify where it can connect to the network

5
We check whether the existing substation network has enough capacity

6
If the current network cannot support the connection, we plan upgrades or new infrastructure

7
Once the developer has completed their required works, connection works can begin

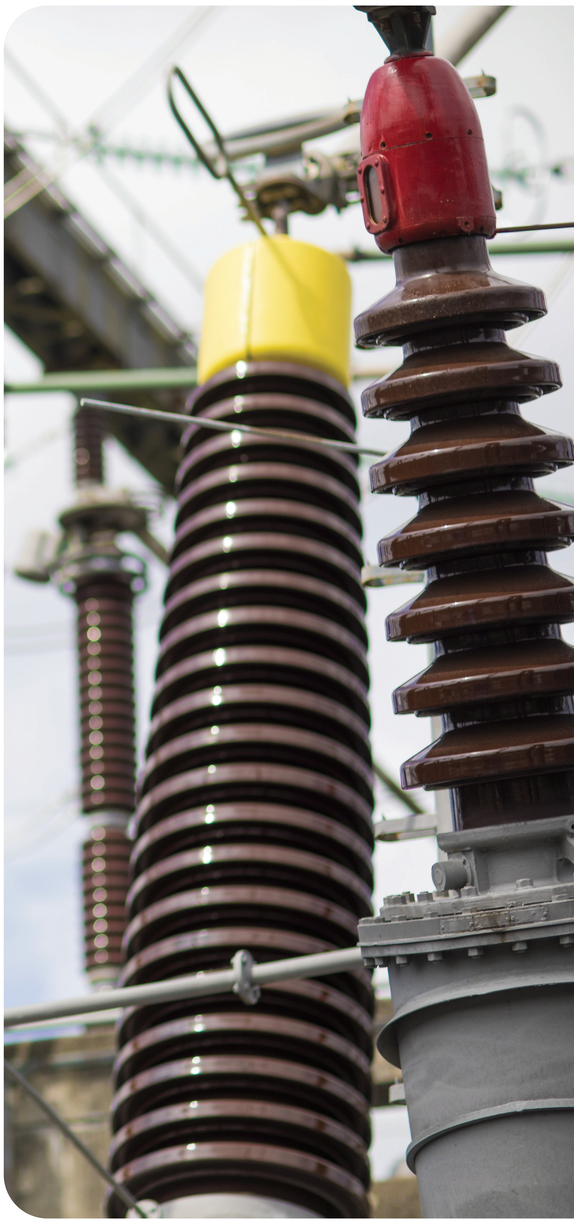
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After all works are finished, the project is connected to the electricity network

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Substations



Substations are a vital link in our network, connecting energy to the grid. They change electricity to the right voltage and direct it safely around the network so power can reach homes and businesses.



There are two different types of substations:

- Air insulated switchgear or AIS uses air to insulate electrical components
- Gas insulated switchgear or GIS uses gas to insulate electrical components.

When planning a new substation we carefully consider space, environmental impacts, cost, safety and maintenance requirements.

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How are Substations Built?



Construction of a substation involves several important steps to ensure it works properly and fits into the local environment.

1
Clear and level the area

2
Excavate the earth to make way for the foundations

3
Buildings will vary depending on the type of substations

4
Clad the buildings in line with planning conditions

5
Install an electrical connection between the substations and the network

6
Landscape the surrounding area – planting hedges and trees to minimise views of the substations

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Aberthaw Substations Redevelopment



In the Cardiff area, several developers have requested to connect their projects to our network.

To connect these projects to our network, National Grid is proposing two new substations on a site adjacent to our existing Aberthaw Substations. Once operational, the project would replace the two existing Aberthaw substations and be known as Gileston Substation.

The site will consist of one 275 kV GIS substation and one GIS 132 kV substation. At this stage of the design, the 275 kV substation building is approximately 140m x 30m and 15m high, whilst the 132 kV is 75m x 25m and 15m high.

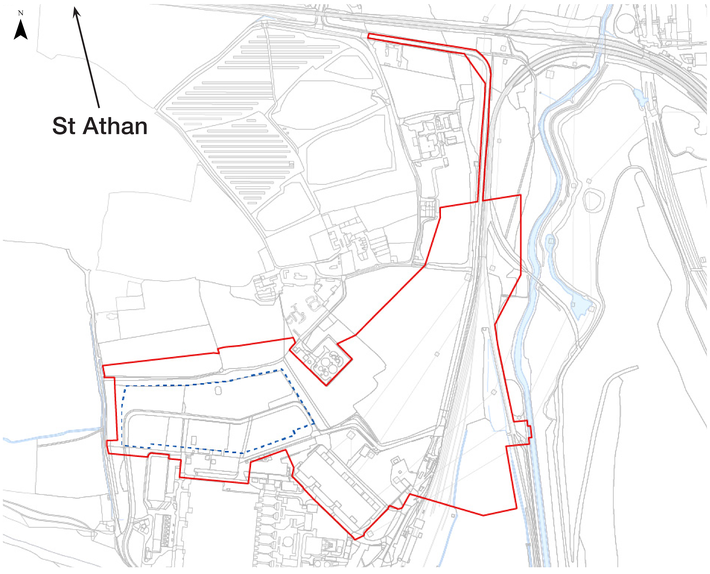
Externally it will appear as one substation and our intention is to mitigate visual impacts as far as possible using landscaping and screening.

The new substations will have an initial capacity of 1.4 Gigawatts (GW), with the potential to rise to 2.1 GW to meet future electricity demand. The capacity of the existing Aberthaw substations is 0.4 GW.



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Aberthaw Substations Redevelopment



Legend

Project Boundary

Operational Compound

Subject to receipt of planning consent from Vale of Glamorgan Council for the two new substations, the two existing substations at Aberthaw will be demolished after the new substations are constructed and operational.

We will seek a separate planning consent from the Council to demolish the two existing substations. In the meantime, our two existing substations will continue to operate safely.

As part of the development, it is also necessary to re-align the final existing towers into the rebuilt substation.

This realignment will include the removal of three existing overhead line towers to be replaced by four proposed permanent overhead line towers as well as three temporary towers that will be required during the construction phase.

We will be seeking a Section 37 consent for the overhead line works separate to the main planning application. Section 37 consent applications in Wales are determined by the Secretary of State for Energy Security and Net Zero, following consultation with local planning authority and other statutory consultees.

Site access for the primary site is planned via the existing access road for the former power station. Temporary access for smaller packages of work, such as new vegetation planting, may need to be accessed via other routes.

We aim to minimise the impact of the project as far as possible on the local environment and community.

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Investing in communities



Communities are at the heart of the UK's transition to more secure, cleaner, home-grown energy from more affordable sources.



National Grid has a long-standing commitment to the communities we work alongside, and we want to ensure lasting benefits for the people and places that host our new infrastructure.

If planning approval is granted, NGET, working alongside our contractors, will support and invest in the local community in a range of ways including through local grant funding, skills development, schools outreach and volunteering.