

The Great Grid Upgrade

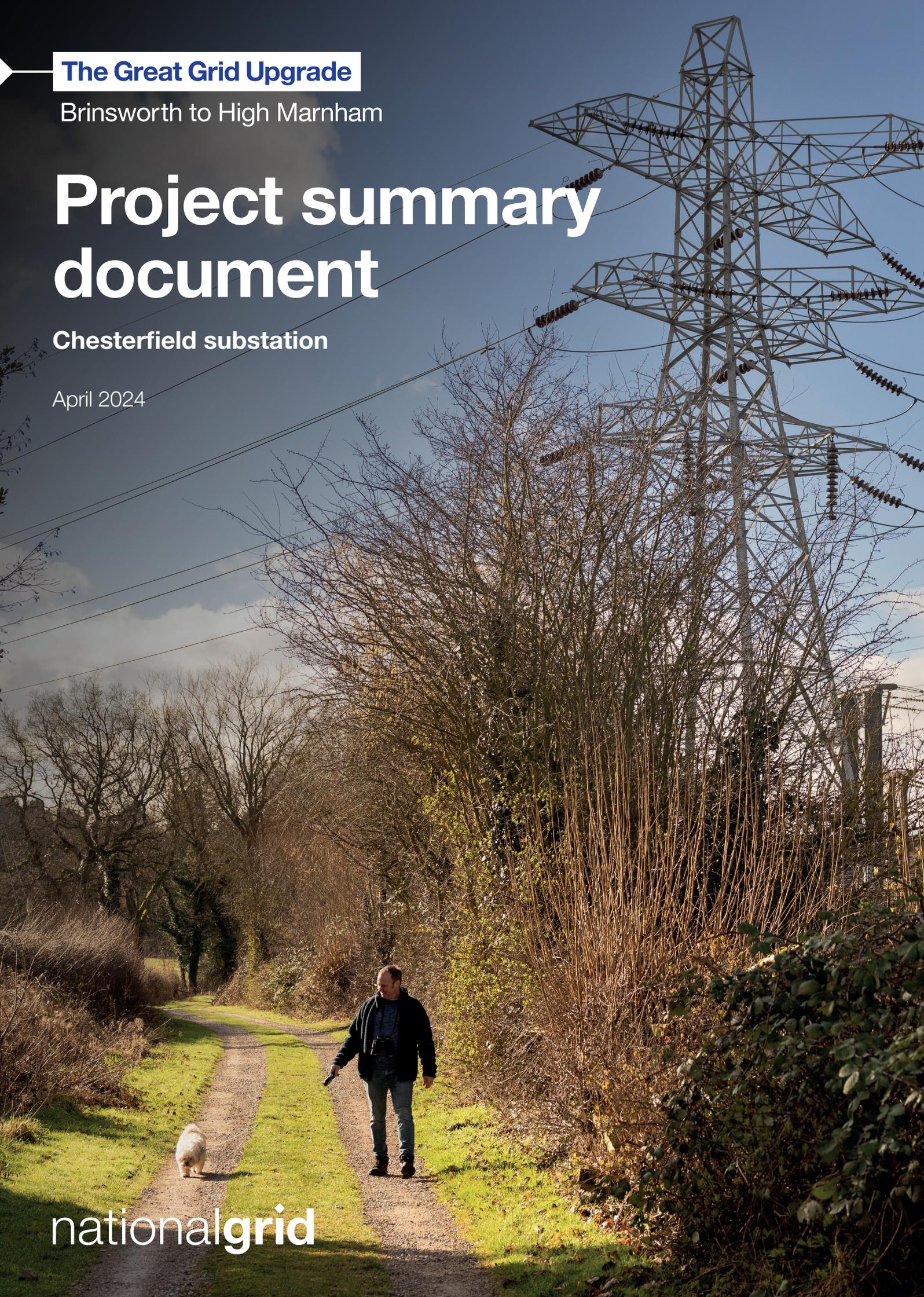
Brinsworth to High Marnham

Project summary document

Chesterfield substation

April 2024

nationalgrid



About National Grid

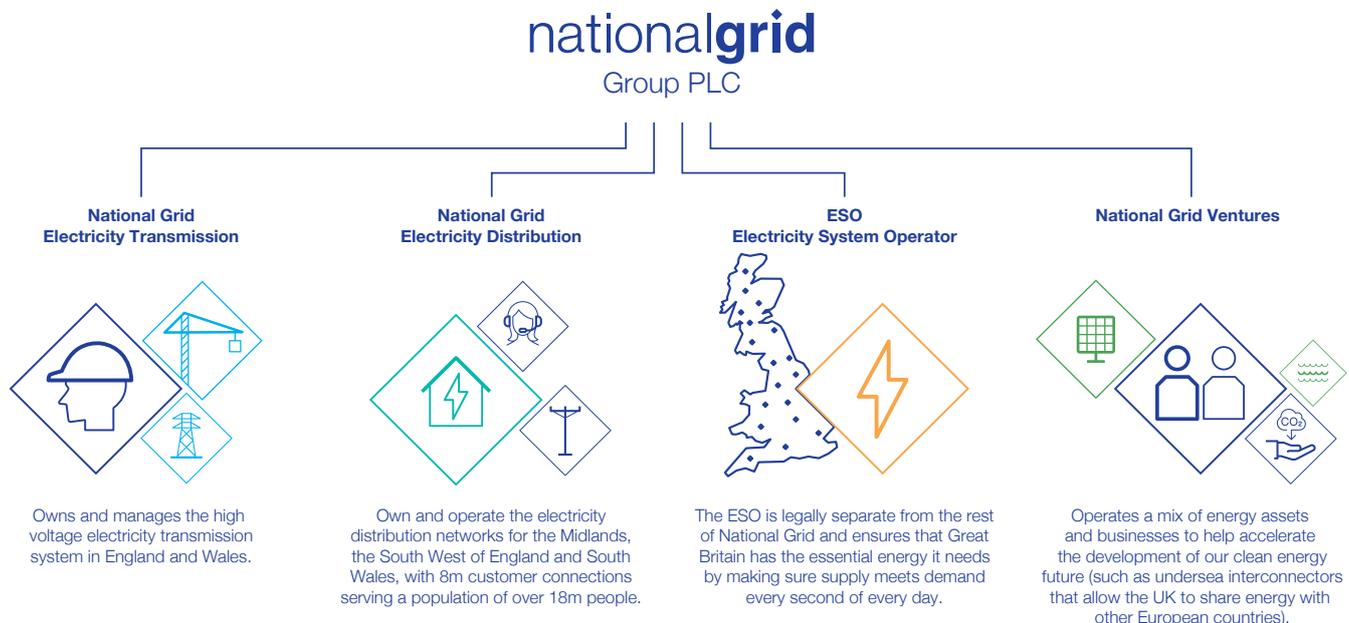
National Grid delivers electricity safely, reliably, and efficiently to the customers and communities we serve – all while working towards building a cleaner and fairer energy system for the future.

The parts of National Grid involved in ensuring we all have the essential electricity supplies we need are shown in the diagram below. Each is a separate legal entity with its own role and responsibilities across England and Wales.

National Grid Electricity Transmission (NGET) sits at the heart of Britain’s 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 is turned on, we’ve played a part - connecting you to the electricity you need.

NGET is developing the proposals set out in this document. It must, under the Electricity Act 1989, do so in an efficient, coordinated and economical way which also considers people, communities and the environment. We have published ten commitments on how we go about doing this in our stakeholder, community and amenity policy¹.

To find out more about how we develop our proposals, please see our video² that explains how we work.



¹ National Grid’s commitments when undertaking works in the UK: Our stakeholder, community and amenity policy (National Grid, December 2019) – Available at https://www.nationalgrid.com/sites/default/files/documents/National%20Grid_s%20commitments%20when%20undertaking%20works%20in%20the%20UK.pdf

² National Grid Electricity Transmission, ‘How we work’ video - Available at players.brightcove.net/867903724001/default_default/index.html?videoId=6329276694112

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Foreword

The UK Government has committed to reach net zero emissions by 2050. This means achieving a balance between the greenhouse gases put into the atmosphere and those taken out. Decarbonising the energy system is vital to achieve net zero.

At National Grid Electricity Transmission, we're investing around £1.3bn each year to adapt and develop our network - of pylons, overhead electricity lines, cables and substations - to connect new sources of low carbon energy to homes and businesses. We're investing for the future, connecting more and more low carbon electricity to our network and playing a crucial role in turning the UK's net zero ambitions into reality.

Our Brinsworth to High Marnham project would transport clean energy from the North of England to homes and businesses in the Midlands and beyond, and play an important role in building a more secure and resilient future energy system.

These proposals form part of The Great Grid Upgrade, which is the largest overhaul of the grid in generations. The Great Grid Upgrade will play a big part in the UK government's plan to boost homegrown power. It will help the UK switch to clean energy and make sure our electricity network is fit for the future; carrying more clean, secure energy from where it's generated to where you need it.

We're now seeking your feedback on our proposed series of works near our existing Chesterfield substation during a consultation period which runs from Monday 22 April to Monday 20 May 2024.

Documents that relate to our proposals, including this Project Summary Document, can be found at www.nationalgrid.com/b-hm To request a copy, please call the Community Relations team on **0800 073 1047** or email brinsworth-highmarnham@nationalgrid.com

Please do share your views, as well as any suggestions regarding what you'd like us to consider, as we continue to develop the project, by **11.59pm on Monday 20 May 2024.**



Consulting on our proposals

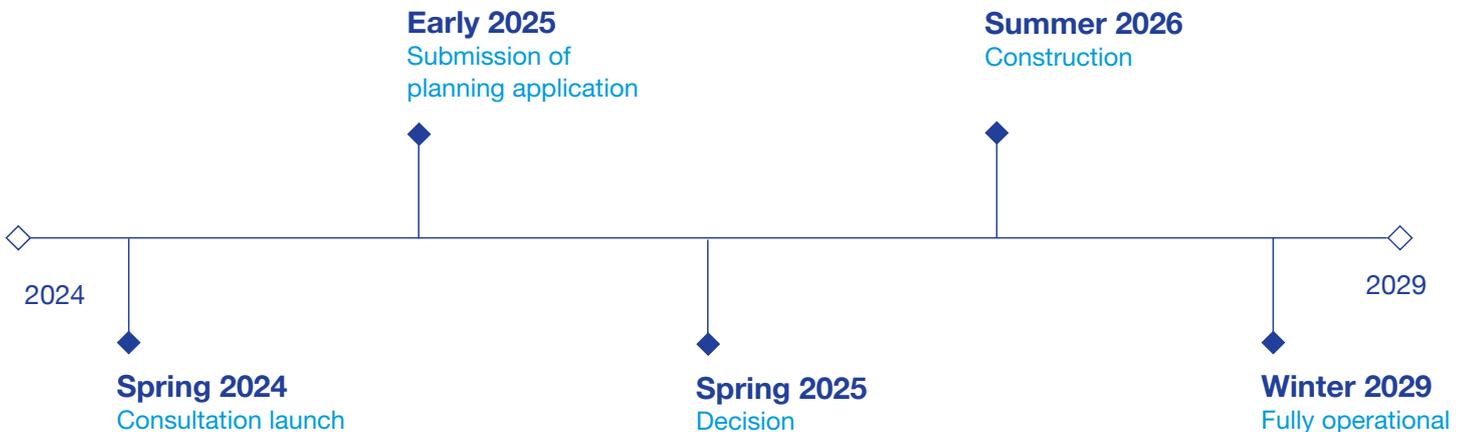
We're now consulting on our proposed series of works to enhance the electricity network by building and operating a new substation near Calow, in Chesterfield, Derbyshire, as part of the Brinsworth to High Marnham project.

We also propose to build and operate new substations near Brinsworth, in Rotherham, South Yorkshire and High Marnham, near Normanton on Trent in Nottinghamshire. The substations would transport clean energy from the North of England to homes and businesses in the Midlands and beyond, and play an important role in building a more secure and resilient future energy system.

The proposals for the new substations in Brinsworth, Chesterfield and High Marnham fall under the Town and Country Planning Act 1990. This means to build and operate them, we need to apply for planning consent from the relevant local authorities – Rotherham Metropolitan Borough Council (Brinsworth), North East Derbyshire District Council (Chesterfield) and Bassetlaw District Council (High Marnham).

The public consultation period for the Chesterfield substation will run for four weeks from **Monday 22 April to Monday 20 May 2024** and is designed to introduce our proposals and gain your feedback. Comments received at this point in the process will play an important part and help shape our plans ahead of the planning application, which we anticipate we'll submit in winter 2025. North East Derbyshire District Council will carry out its own public consultation as part of the process to determine the planning application.

The deadline to provide feedback is **11.59pm on Monday 20 May 2024**.





Public consultation scope

In addition to the three new substations, we also need to upgrade the existing overhead electricity lines that run between Brinsworth and Chesterfield and Chesterfield and High Marnham. This work is known as 'uprating' and means they'll be able to operate at 400 kV, rather than the existing 275 kV. This will provide the necessary additional capacity to transport low carbon electricity from the North of England to the Midlands and beyond.

The existing overhead electricity lines between Brinsworth to Chesterfield and Chesterfield to High Marnham were approved in the 1960s to operate at 400 kV but have only operated at 275 kV to date. This series of work will rely on a combination of permitted development, existing planning consents and section 37 of the Electricity Act 1989, so this doesn't form part of our consultation.

How to find out more

We'll hold a series of face-to-face events (see Page 9) which will include information about our proposals, with copies of maps available to view. Members of the project team will also be available to answer questions.

Our online webinar will include a presentation of our proposals followed by a question and answer session (see Page 9). Details on how to sign-up for a webinar are available on the project website. Alternatively, you can call us on **0800 073 1047** or email **brinsworth-highmarnham@nationalgrid.com**

To learn about our proposals you can:

- read this Project Summary Document
- visit our website at www.nationalgrid.com/b-hm
- attend a public consultation event (see Table 1, page opposite)
- join an online webinar (see Table 2, page opposite)
- call us on freephone 0800 073 1047 between 9am and 5.30pm
- email brinsworth-highmarnham@nationalgrid.com

To provide feedback on our Brinsworth to High Marnham proposals you can:

- complete the online feedback form on our website www.nationalgrid.com/b-hm
- email your comments to: brinsworth-highmarnham@nationalgrid.com
- call us on freephone 0800 073 1047 between 9am and 5.30pm
- post your written responses to:
FREEPOST National Grid Projects (JBP)
(no stamp or additional address information required).

We must receive your comments by 11.59pm on Monday 20 May 2024.



Table 1: Public consultation events

Location	Information event venue	Date	Time
High Marnham	South Clifton Coronation Hall South Clifton, Newark, NG23 7BG	Friday 26 April	2pm – 7pm
	Normanton on Trent Village Hall South Street, Normanton on Trent, NG23 6RQ	Saturday 27 April	9am – 2pm
Chesterfield	Calow Community Centre Allpits Road, Calow, Chesterfield S44 5AT	Friday 10 May	2pm – 7pm
		Saturday 11 May	9am – 2pm

Table 2: Webinars

Webinar session	Date	Time
High Marnham	Wednesday 24 April	6pm – 7pm
Chesterfield	Wednesday 1 May	6pm – 7pm

The need for Brinsworth to High Marnham

The electricity transmission network today in the region

Like much of the high voltage electricity transmission network across the country, the network in the North of England and the Midlands was largely built in the 1960s. It was designed to connect in-land, large coal-fired power stations and nuclear power stations in the North and Midlands areas. Little or no transmission infrastructure was constructed in some areas, so there is currently limited ability to support connections on the coast. Today, power still flows largely north to south on this part of the network.

Why does the network in the region need reinforcing?

Demand for electricity is expected to rise as the way we power our homes, businesses and transport changes. As the nation moves towards net zero, the fossil fuels that once powered our economy will be replaced with sources of low-carbon electricity.

The UK Government has set targets of 50 GW of offshore wind generation by 2030 and up to 140 GW by 2050. There is increased growth forecast in offshore wind capacity in Scotland and the North East of England, as well as increasing power flows to and from European power grids. This will put pressure on the existing network, such that reinforcement of the network in the Midlands region has been identified as necessary to secure the operation of the transmission system and ensure reliable, economic long-term supply.

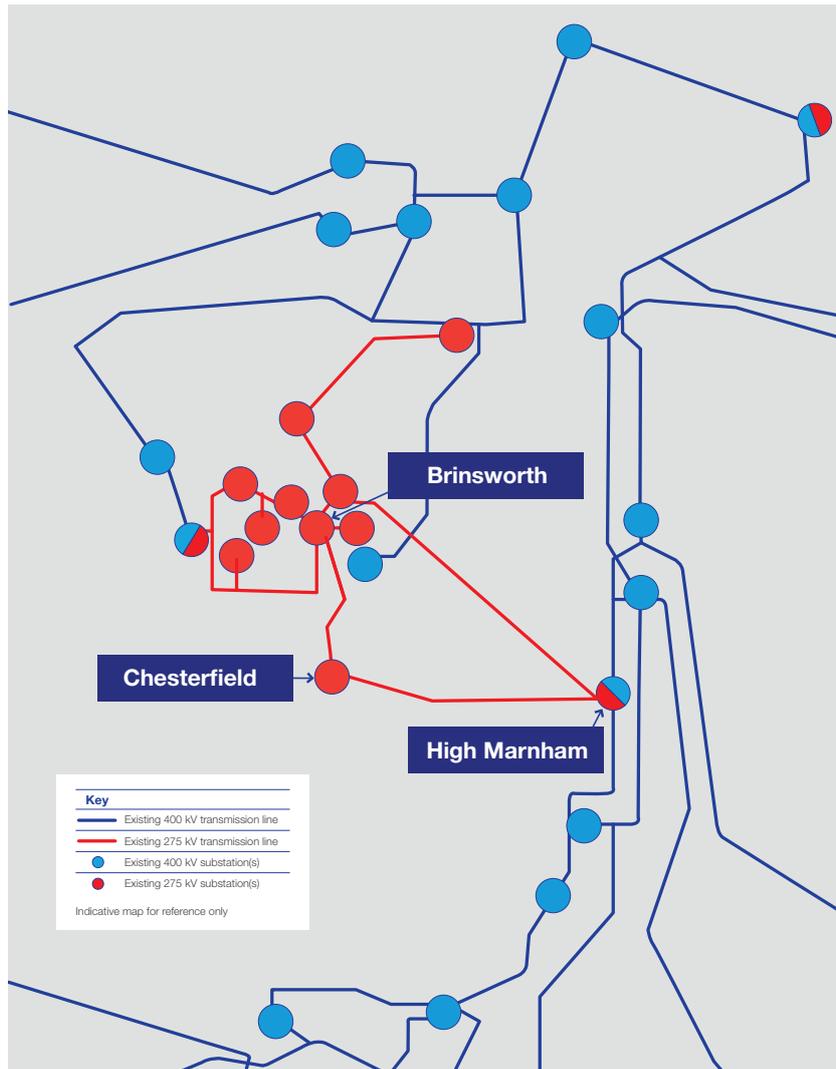
It is anticipated that the network between the North of England and the Midlands needs to be capable of transferring around 31 GW of electricity by 2035, compared to the 11.6 GW that it can transfer today.

Some of the existing network in the centre of the country operates at 275 kV, which limits its capacity. The Brinsworth to High Marnham project is a series of works that will reinforce the network in this area through new substations, which enable electricity to be transported at different voltages, and upgrading some of the existing overhead electricity lines from 275 kV to 400 kV. This will provide the necessary increased capacity of the electricity transmission network between South Yorkshire and the North Midlands area.

The development of the three new substations will also assist in rationalising this part of the transmission system to improve operational flexibility, to meet localised demand and to address anticipated customer connections in each location.

A watt is a measure of power and there are 1 billion watts in 1 GW. 1 GWh (Gigawatt Hours) is the equivalent of powering one million UK homes for one hour.

A kV is a measurement of electrical voltage. The measurement stands for kilovolts or one thousand volts. Put simply, the higher the kV capacity of an overhead line, the more power it can transport.



Existing infrastructure map

Network capacity and demand

There are several new sources of clean green energy contracted to connect in the region by the mid-2030s – either direct to the transmission network or to the lower voltage distribution network.

Without upgrading, the network won't have the capacity that's needed to move electricity across the network from where it's produced to where it's needed. Therefore, we need to upgrade our network to maintain system compliance and prevent overloading circuits as they transport the energy that's generated. In addition, the substations will connect new renewable electricity generation and storage that's planned in the area.

The Brinsworth to High Marnham project will support the UK's net zero target by adding capacity to accommodate increasing power flows of energy generated mostly from offshore wind, in Scotland

and North East England, which is expected to double within the next ten years, to areas of demand south to the Midlands and beyond. By reinforcing the network in the centre of the country, the project will facilitate the connection of more renewable and low-carbon electricity, to allow clean green energy to be carried around the network.

This project is one of several network upgrades designed to get greater capability out of the existing network; allowing more electricity to pass through the transmission network and help accelerate the connection of clean energy projects. This ensures we're getting more out of our existing infrastructure, before building new. The new substations near Brinsworth, Chesterfield and High Marnham will enable us to upgrade the existing network in the region and connect future transmission network projects as part of The Great Grid Upgrade.

Our proposals

We propose a series of works to build and operate three new substations – one near Brinsworth, another near Chesterfield and a third in High Marnham – to allow us to safely carry more energy between the North of England and the Midlands.

The proposed substations would also enable us to upgrade the existing Brinsworth to Chesterfield and Chesterfield to High Marnham overhead electricity lines and connect future electricity transmission network projects as part of The Great Grid Upgrade.

What is a substation?

Substations are part of the network used to transport power securely from where it's generated to where it's needed. They house electrical equipment which enables the system operator to control the flow of electricity and come in many sizes and configurations, depending on need. A substation will often have visible electrical equipment with the substation site protected by fencing. One of the main roles of substations is to convert electricity into different voltages. Substations are also key in helping to isolate and fix faults and allow maintenance to be carried out safely on the electricity network.

How we identify proposed substation locations

Once the National Grid Electricity System Operator (ESO) identified a need to reinforce the network between the North of England and the Midlands, NGET identified the requirement for three new substations to support the upgrading of the existing overhead electricity lines to 400 kV between Brinsworth and Chesterfield and Chesterfield and High Marnham.

Selecting an appropriate location for a new substation is critical to ensure secure and reliable electricity supplies, while balancing consumer costs, effects on communities and the environment and engineering requirements. We've taken all of these into consideration to identify the proposed sites near Brinsworth, Chesterfield and High Marnham, including their proximity to the existing network.



Different types of substation

There are primarily two different types of substation – air insulated switchgear (AIS) substations and gas insulated switchgear (GIS) substations.

AIS relies on air as the insulation medium for electrical components and is the most common type, which accounts for more than 70 per cent of substations all over the world, while GIS uses gas insulation.



A National Grid AIS substation - for illustrative purposes only.



A National Grid GIS substation - for illustrative purposes only.

The decision between AIS and GIS depends on several factors including availability of space (AIS needs more space between the equipment), potential environmental impacts, cost, safety and maintenance requirements.





Our Chesterfield proposals

We propose to build and operate a new 400 kV substation which will extend to the south of our existing AIS substation site off Calow Lane in Cock Alley, near Chesterfield in Derbyshire. We'd remove some of the existing equipment and replace it with new infrastructure.

We're proposing it will be a GIS substation as it's more compact than AIS and there's limited space available at the site. Most of the equipment would be housed within a single building.

The new substation would be within a compound approximately 150 metres x 165 metres – the size of around 3.5 football pitches – and includes supergrid transformers, which are used to increase or decrease the voltage of electricity between different circuits. It would include approximately 16 bays, network stability equipment, standard substation plant and control infrastructure.

Chesterfield



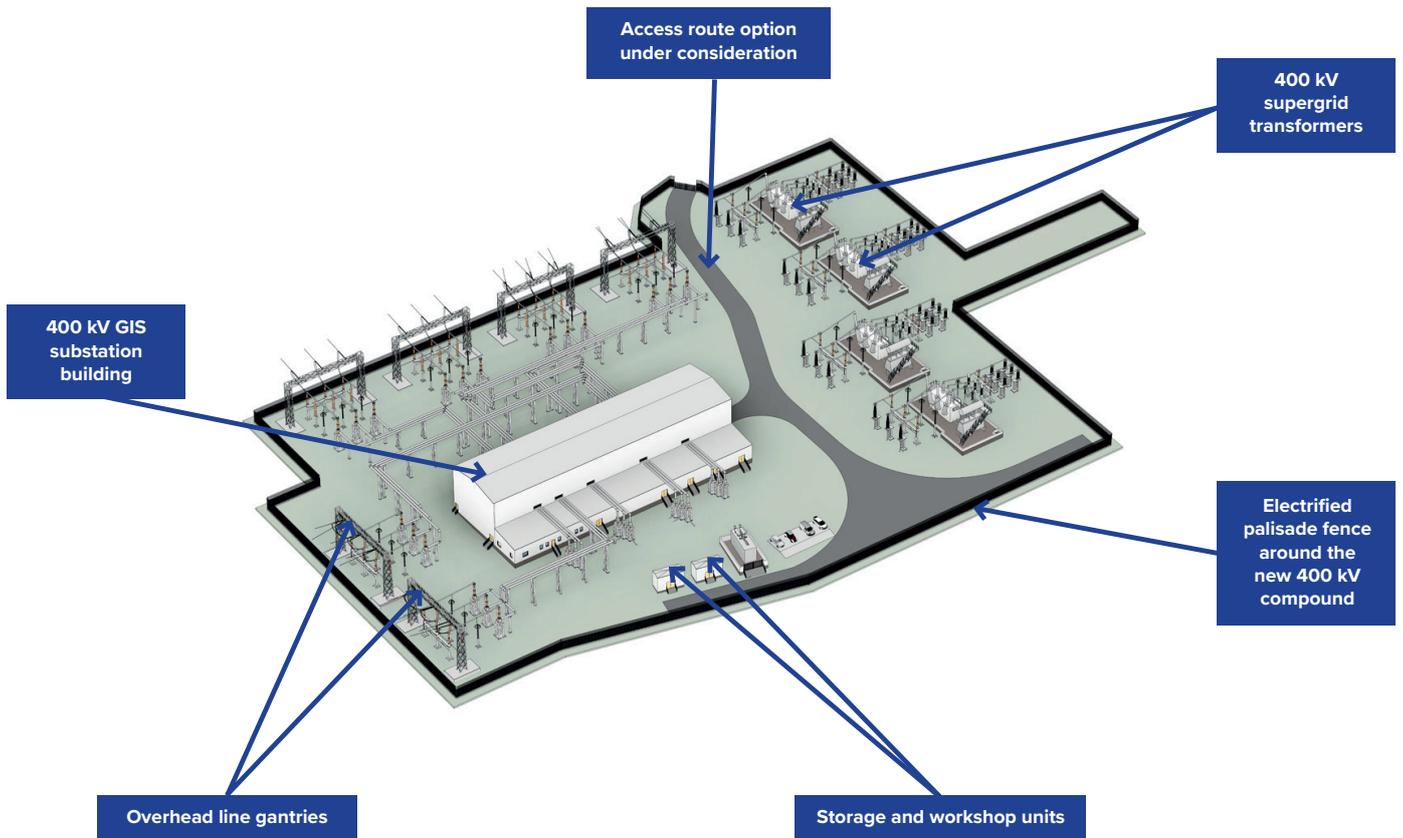
Proposed substation location

Map data ©2024 Google

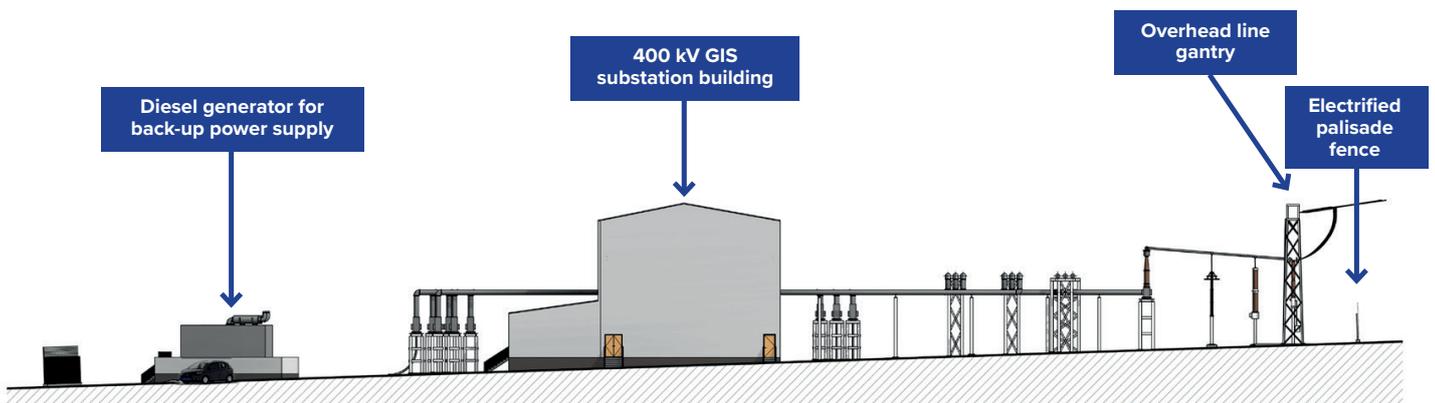
Key

 Access route options under consideration

Indicative map for reference only



Indicative CGI of the new 400 kV GIS substation design



Sectional view of the site looking north to south (GIS building is approximately 14 metres in height)

The GIS building would be the highest structure within the substation compound, at approximately 14 metres. We also propose six overhead line gantries, which are bridge-like structures with platforms used to support equipment and cabling. The footprint of the site has the potential for some future expansion, if required.

Three pylons currently connect into the existing substation. We'll remove two of the existing pylons and replace them with new pylons in alternative positions to the south and south west of the new 400 kV substation site. One of the existing pylons will remain in its current position and connect into the new substation. We'll remove another pylon as shown on the map.

We also propose a temporary diversion of the Chesterfield to High Marnham overhead electricity line, with temporary pylons during construction. We expect these temporary diversions will be in place for around two years. We'll include details when we submit our planning application.

Chesterfield



Pylons and overhead electricity lines
Map data ©2024 Google

Key	
	Existing overhead electricity line
	Existing pylon
	Proposed new overhead electricity line
	Proposed new pylon
	Proposed overhead electricity line to be removed
	Proposed pylon to be removed

Indicative map for reference only

Construction

Should consent be granted for the Brinsworth to High Marnham substations, we expect construction would start in summer 2026 and take approximately three years to complete. This section includes our initial thinking on construction access and traffic for each substation site. Detailed construction plans will depend on the final substation designs as well as further environmental and technical studies.

We will use a new access, west of the existing substation, off Calow Lane to the north of the site for both construction and when the substation is operational. We will also use the existing access point off Calow Lane during construction.

Due to the nature of the proposed series of work, and the vehicle numbers required for both the construction and operation phase, with the appropriate traffic management in place it is unlikely that significant effects will occur. A Construction Traffic Management Plan (CTMP) will be submitted alongside the planning application. Consultation will be undertaken with the relevant bodies. The approach to any potential public right of ways closure or diversion would be undertaken in liaison with the local planning authority as well as wider consultation.

Further information on traffic movements and temporary changes required to Calow Lane and public right of way, implications and mitigation would be provided in the Transport Appraisal within the Environmental Assessment Report. The CTMP for the proposed series of work would set out how any potential impacts of road-based construction traffic would be reduced by identifying measures such as clear controls, hours of site operation, routes for large goods vehicles, and the timing management of deliveries. Operational traffic would be minimal; it is expected that under normal circumstances up to approximately ten cars/ light goods vehicles would visit the site each month.

There is the potential for impacts to public right of way users during the construction phase as a result of either permanent closures or potential temporary closures and loss of amenity value during works. Impacts during construction will be localised and temporary in nature. Construction best practice methods will also be implemented to reduce any temporary effects during the construction phase. Where possible vegetation will be retained. All construction mitigation measures will be detailed within the CTMP.





How we manage and mitigate effects

Feedback from community consultation, along with findings from our ongoing environmental assessments, will help shape our series of works for the Brinsworth to High Marnham project.

When we develop new infrastructure, we seek to reduce the effect of our work on communities, particularly in regard to noise. We adhere to environmental and sustainability standards and follow the code of practice for noise and vibration control on construction and open sites.

Our commitment also extends to the environment where we carefully consider factors such as Biodiversity Net Gain (BNG).

The Environment Act of 2021 mandates a minimum 10 per cent BNG for new developments, ensuring they contribute positively to biodiversity enhancement. As part of our Environmental Assessment Report (EAR), we'll include an Ecological Appraisal (EA) alongside our planning application that we'll submit to North East Derbyshire District Council.

We'll conduct a BNG Assessment as part of our planning application process, outlining biodiversity proposals such as species planting and other mitigation measures aimed at achieving a minimum 10 per cent BNG.

Integrating these considerations into our processes will help us achieve a balanced approach that harmonises development goals with community wellbeing and environmental preservation.

This will include findings from our early studies on key topics at each proposed location.

Landscape and visual impacts

The existing substation site is well shielded by mature vegetation in certain locations, particularly along Calow Lane, which we'd preserve where possible to limit changes to views. If needed, we'd provide additional landscaping to reduce the visual impact of the new substation within the landscape. The undulating nature of the landscape in the area around the site, along with the existing mature vegetation and appropriate landscaping, would reduce any potential long term significant visual effects. We'll include a landscape and visual assessment as part of the planning application.

We've already carried out initial surveys to better understand the landscape within and around the site. Additional work is planned throughout 2024, including landscape walkovers and public rights of way surveys, along with consultations with stakeholders such as Natural England and North East Derbyshire District Council. The findings will help us to develop our proposals in a way that will reduce impacts on the area.

Heritage

There are 15 Grade II listed buildings within two kilometres of the site, most of which are along the A632 Chesterfield Road/Top Road to the north, or in Hasland to the south-west. Given the distance between the site and the listed buildings, we don't expect there would be any significant direct or indirect effects due to construction or operation of the proposed substation. There are no World Heritage Sites, Scheduled Monuments, Registered Battlefields or Registered Parks and Gardens within two kilometres of the site.

Wildlife and nature

We've carried out surveys to determine whether the site has the potential for habitats of protected and notable species and more are ongoing to inform our plans. We'll work closely with North East Derbyshire District Council on any required mitigation measures during the planning application process.

We've conducted preliminary surveys of the proposed site and initial ecological surveys focusing on protected species including 'great crested newts. The purpose of these surveys was to evaluate waterbodies within a 500-metre radius of the proposed works. The four ponds initially included in the assessment were found to have poor suitability for great crested newts.

If we identify any protected species on the site, we'll carry out any removal of habitats outside the nesting season. If we need to carry out clearance works within the main nesting season, an experienced ecologist will conduct a nesting bird check.





Other information

Landowners

Where the land we need for our proposals isn't owned by National Grid, we'll actively engage in discussions with landowners. If you think our proposals could affect your land, please contact the Brinsworth to High Marnham Land Referencing Team at Ardent. You can call 0203 693 2500 or email brhm@ardent-management.com. Alternatively, you can write to Ardent, 36-38 Botolph Lane, London, EC3R 8DE.

Ardent will contact landowners and occupiers to agree licences around temporary access for non-intrusive and intrusive surveys that we'll need to carry out during 2024. Land Information Questionnaires have previously been sent to landowners along the existing route. If you believe you're likely to be impacted and haven't received the Questionnaire, please get in touch with Ardent using the contact details above.

Coordination with other projects in the area

Alongside our proposals for Brinsworth to High Marnham, two other NGET projects are proposed in the Derbyshire and Nottinghamshire areas – Chesterfield to Willington and North Humber to High Marnham. These will connect into the proposed new Brinsworth to High Marnham substations in Chesterfield and High Marnham respectively.

Chesterfield to Willington is a proposal to build a new high voltage overhead electricity line and associated works between the proposed substation near Chesterfield and the existing Willington substation.

We expect to submit the Development Consent Order (DCO) application in 2026 and, if consented, would be fully operational from 2031.

We expect to submit the North Humber to High Marnham DCO application in 2026 and, if consented, would be fully operational from 2031.

We'll work closely with the Chesterfield to Willington and North Humber to High Marnham teams to identify opportunities to ensure coordination and reduce disruption where possible.



Next steps

We value your input as we develop our plans – feedback from local communities and stakeholders will help inform and shape our proposals. During our ongoing community consultation over the coming months, we will:

- continue our discussions with landowners and people with an interest in land which interacts with the project
- meet local elected representatives
- carry out environmental impact assessment work and carry out surveys at the proposed substation locations
- provide updates to the local community and to those who have asked to be kept abreast of our proposals
- prepare a Statement of Community Involvement alongside our application to show how we've considered your views.

Following further development and finalisation of our series of works, we intend to submit planning applications to Rotherham Metropolitan Borough Council, North East Derbyshire District Council and Bassetlaw District Council in early 2025.







Feedback

We want to hear the views of local communities near the proposed series of works. Please ensure we receive your comments by 11.59pm on Monday 20 May 2024.

To provide feedback on our Brinsworth to High Marnham proposals you can:

- Complete the online feedback form on our website www.nationalgrid.com/b-hm
- Email your comments to: brinsworth-highmarnham@nationalgrid.com
- Call us on freephone **0800 073 1047**
Monday to Friday between 9am and 5.30pm
- Post your written responses to:
FREEPOST National Grid Projects (JBP)
(no stamp or additional address information required).





Contact us

Please get in touch if you have any questions about our proposals for Brinsworth to High Marnham.

Call our freephone:

0800 073 1047 Monday to Friday between 9am and 5.30pm

Email us: brinsworth-highmarnham@nationalgrid.com

Write to us:

FREEPOST National Grid Projects (JBP)

(no stamp or additional address information required)

If you think our proposals could affect your land, please contact the Brinsworth to High Marnham Land Team at Ardent. You can call **0203 693 2500** or email brhm@ardent-management.com. Alternatively, you can write to **Ardent, 36-38 Botolph Lane, London, EC3R 8DE**.



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April 2024