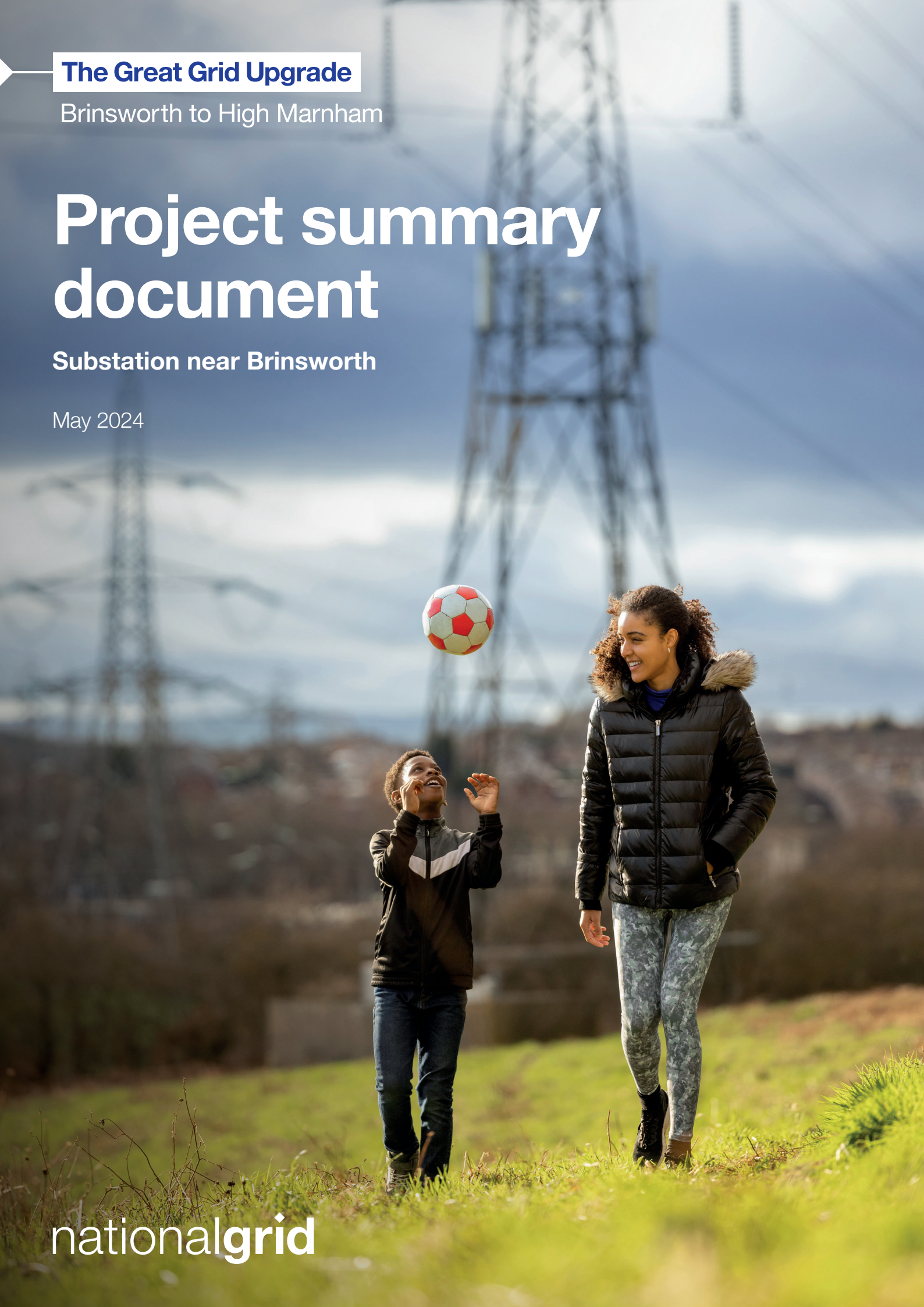
The Great Grid Upgrade

Brinsworth to High Marnham

Project summary document

Substation near Brinsworth

May 2024



nationalgrid

About National Grid

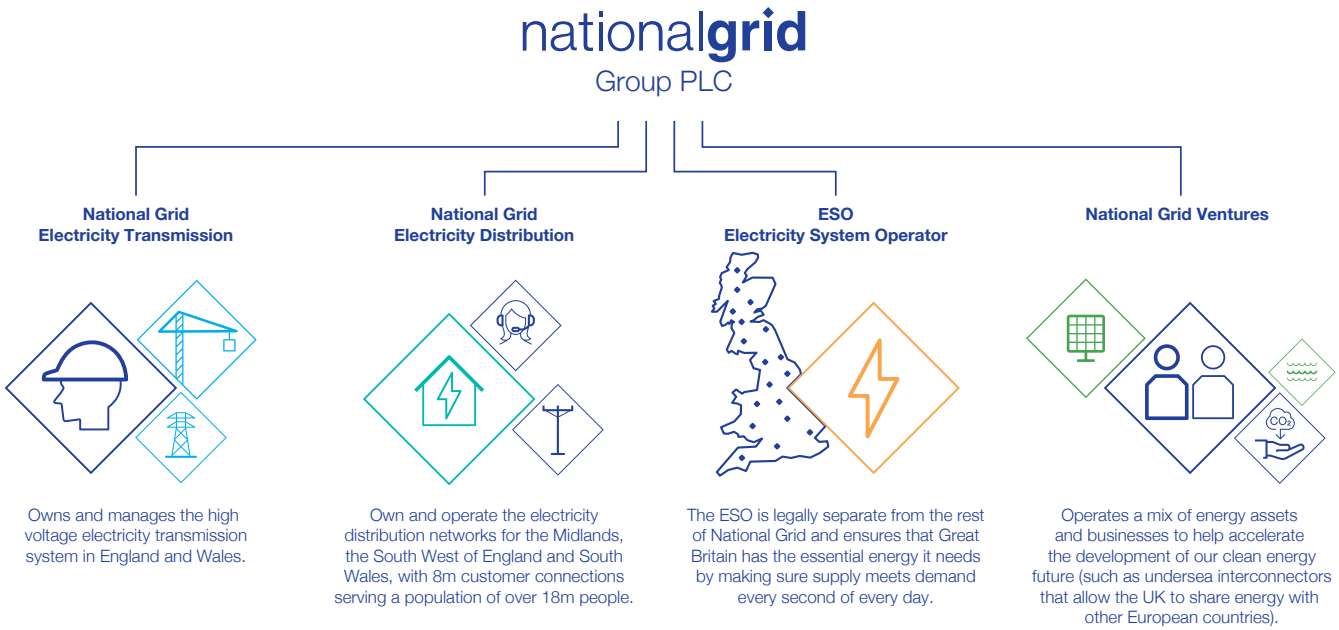
National Grid delivers electricity safely, reliably, and efficiently to the customers and communities we serve – all while working towards building a cleaner and fairer energy system for the future.

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 policy[1].

To find out more about how we develop our proposals, please see our video[2] 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/electricity-transmission/document/81026/download

[2] National Grid Electricity Transmission, 'How we work' video - Available at National Grid Electricity Transmission - how we work (brightcove.net)

Contents

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 work east of Long Lane near Brinsworth during a consultation period which runs from Monday 20 May to Monday 22 July 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 **Monday 22 July 2024.**

Consulting on our proposals

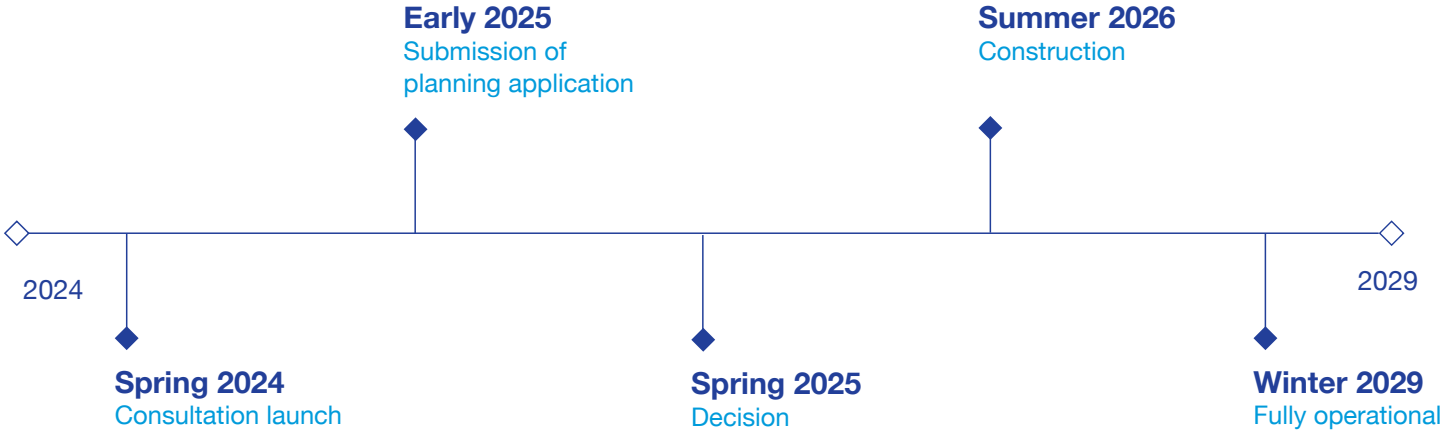
We're now consulting on our proposed series of works to enhance the electricity network by building and operating a new substation east of Long Lane near Brinsworth in Rotherham, as part of the Brinsworth to High Marnham project.

We also propose to build and operate new substations in Chesterfield in Derbyshire 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 near 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 new substation near Brinsworth will run for four weeks from **Monday 20 May to Monday 22 July 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 early 2025. Rotherham Metropolitan Borough Council will carry out its own public consultation as part of the process to determine the planning application.

The deadline to provide feedback is **Monday 22 July 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 Table 1, 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 Table 2, page 9). Details on how to sign-up for the 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 the 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 22 July 2024.

Table 1: Public consultation events

Location	Information event venue	Date	Time
Whiston	Whiston Parish Hall, Well Lane, Whiston, Rotherham, S60 4HX	Wednesday 10 July	12:30pm – 5:30pm
Brinsworth	The Centre, Brinsworth Lane, Brinsworth, Rotherham, S60 5BU	Thursday 11 July	2pm – 7pm

Table 2: Webinar

Webinar session	Date	Time
Brinsworth	Tuesday 9 July	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.

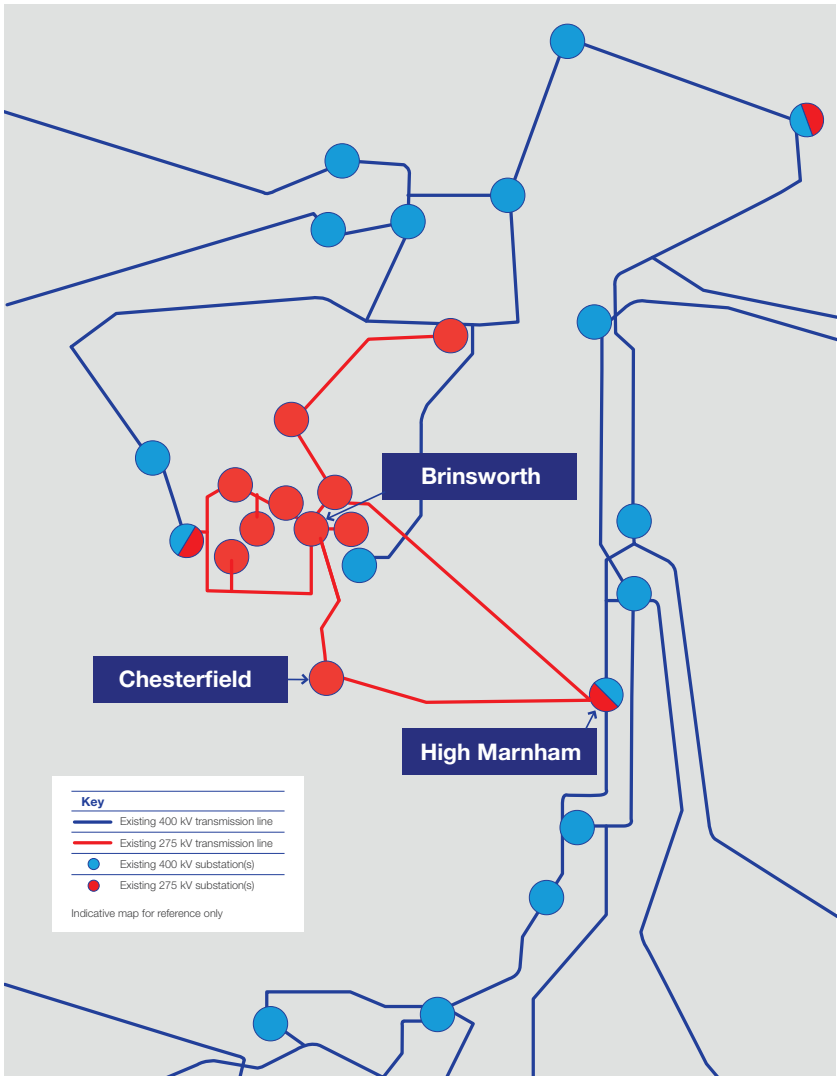
A watt is a measure of power and there are 1 billion watts in 1 GW. 1 GWh (Gigawatt Hours) is the equivalent of powering one million UK homes for one hour.

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.

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.



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 uprating, 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 uprating 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. 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.

A National Grid AIS substation - for illustrative purposes only.

A National Grid GIS substation - for illustrative purposes only.

Our Brinsworth proposals

We propose a series of works to build and operate a new 400 kV substation east of Long Lane near Brinsworth in Rotherham, South Yorkshire.

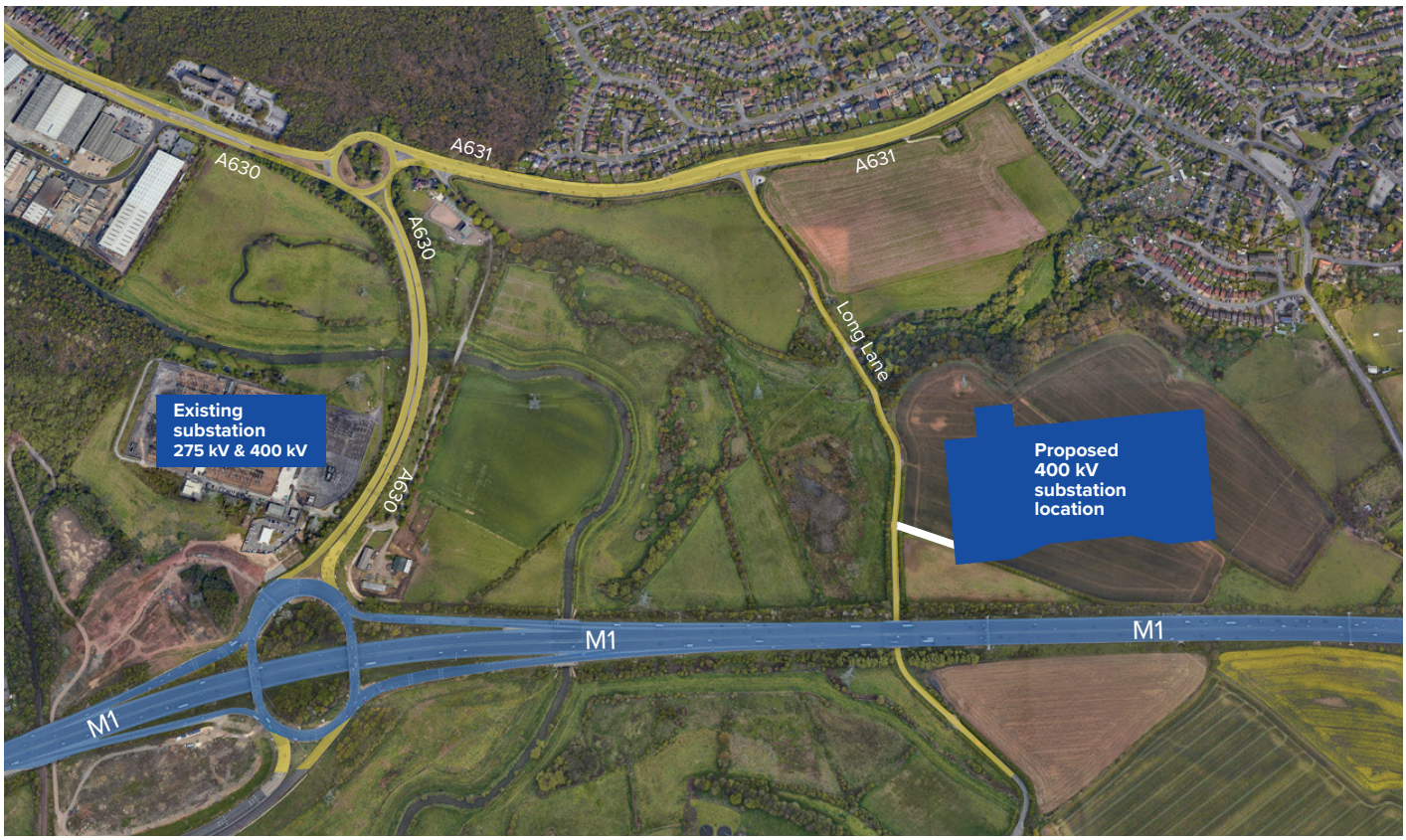
We need to build a new substation as the existing Brinsworth substation, off West Bawtry Road, does not have enough space on-site to accommodate the additional equipment.

We expect to build an AIS 400 kV substation as the proposed site has sufficient space to accommodate an AIS.

The new substation would be within a compound approximately 380 metres x 200 metres - the size of around 11 football pitches – and include approximately 12 bays, network stability equipment, and standard substation plant and control infrastructure.

The highest structures within the substation compound would be six overhead line gantries, which are bridge-like structures with platforms used to support equipment and cabling. At approximately 12 metres, they would be the highest structures within the substation compound. The site's footprint has the potential for some future expansion if required. The existing substation would remain in operation.

Brinsworth

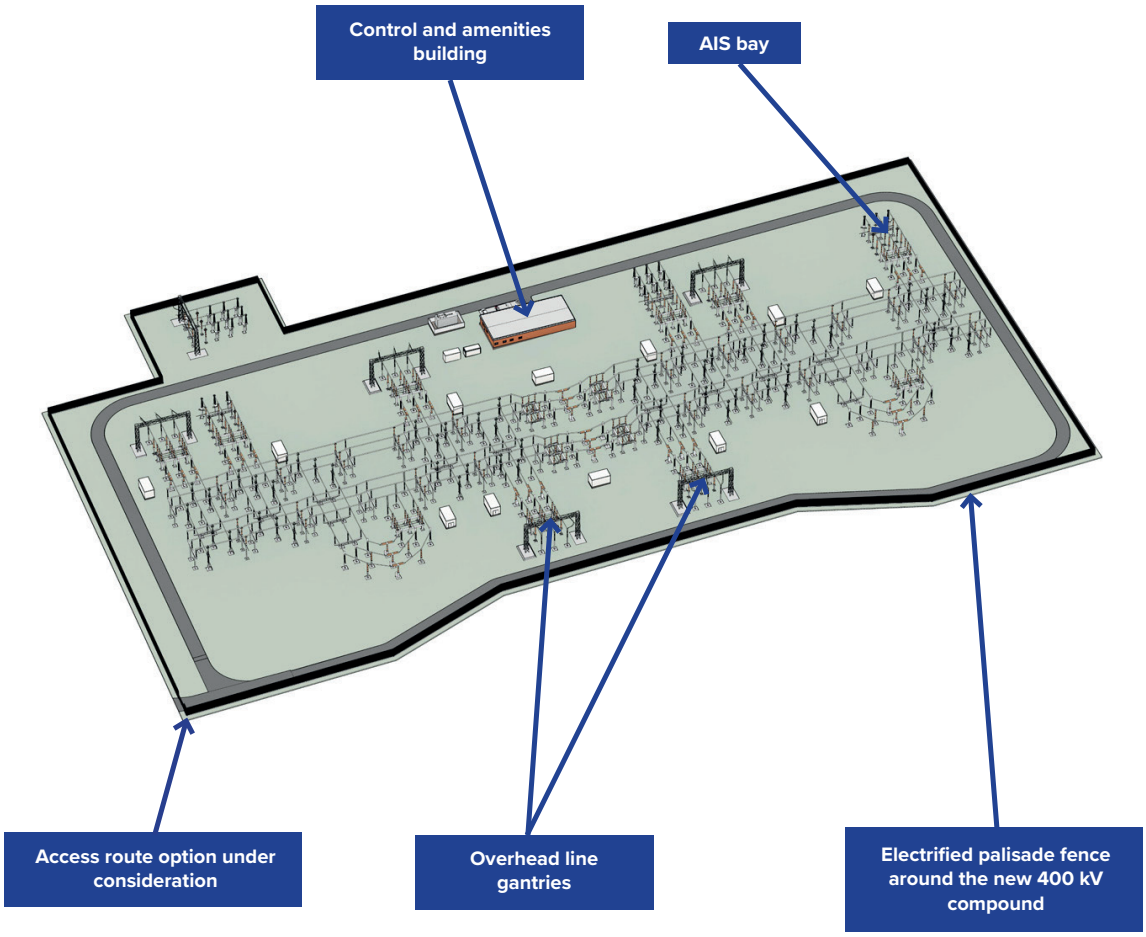


Proposed substation location
Map data ©2024 Google

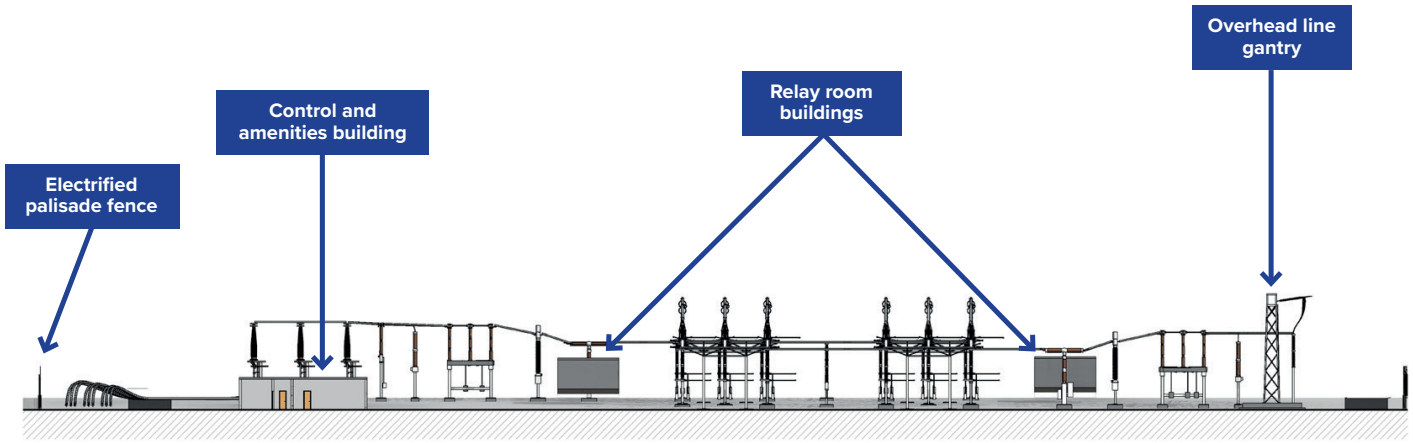
Key

Access route options under consideration

Indicative map for reference only



Indicative CGI of the new 400 kV AIS substation design

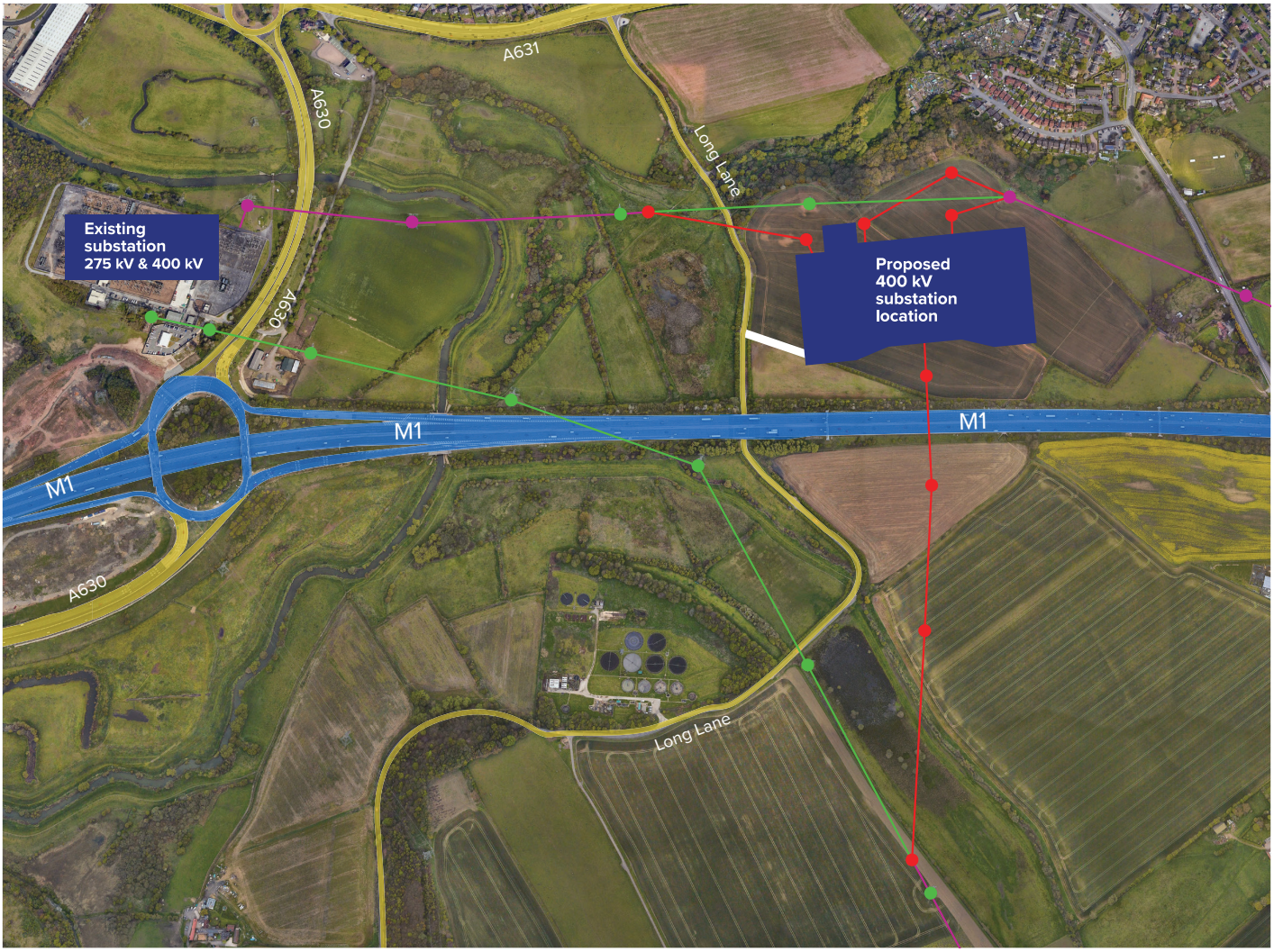


Sectional view of the site to the east

To turn the overhead line into the new substation, we'd need to build nine new pylons and remove nine existing pylons.

We also propose temporary diversions of the existing Brinsworth to Thorpe Marsh and Brinsworth to Chesterfield overhead lines, with temporary pylons during construction. We expect these temporary diversions to be in place for less than six months. We'll include details when we submit our planning application.

Brinsworth



Pylons and overhead 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
- Access route option under consideration

Construction

Should consent be granted for the Brinsworth to High Marnham substations, we expect construction will start in 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 and further environmental and technical studies.

We expect to access the proposed site near Brinsworth from the west, via Long Lane, during both the construction and operational phases. Long Lane benefits from a direct connection to the strategic road network, including the A631, A630 and M1.

We'll assess the proposals' potential traffic and transport effects as part of our planning application process. Before we start construction on the site, we'll submit a comprehensive Construction Traffic Management Plan to Rotherham Metropolitan Borough Council. This will detail our measures for mitigating the effects of road-based construction traffic, including implementing clear controls, defining hours of operation, specifying routes for large goods vehicles, and managing the timing of deliveries to minimise disruptions. Once the substation becomes operational, we anticipate minimal traffic to and from the site. It is expected that under normal circumstances up to approximately ten cars/ light goods vehicles would visit the site each month.

While we don't currently anticipate any permanent closures of Public Rights of Way, there are two within the site that we may need to divert. We'll include details in the Environmental Assessment Report we'll submit to Rotherham Metropolitan Borough Council, and we'll agree any temporary closures or diversions with the council. We'd inform neighbours of planned future closures and ensure diversions are clearly marked, including on connecting paths, to maintain clear and accessible routes.

How we manage and mitigate effects

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

When we develop new infrastructure, we seek to reduce the effect of our work on communities, particularly regarding 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.

The Environment Act of 2021 mandates a minimum of 10 per cent Biodiversity Net Gain (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 Rotherham Metropolitan Borough Council.

We'll conduct a Biodiversity Net Gain 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 gain.

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

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

Landscape and visual impacts

The site's hilly nature and the level of existing vegetation would limit any visual impact during the new substation's operation. However, some construction activity may be visible despite the existing vegetation on the edge of the site, although this would be short-term and temporary. We'll include a landscape and visual assessment as part of the planning application. If needed, we'd provide additional landscaping to reduce the visual impact of the new substation within the landscape.

We've already carried out preliminary surveys to better understand the landscape within and around the site. Additional work is planned for 2024, including landscape walkovers and Public Rights of Way surveys, along with consultations with stakeholders such as Natural England and Rotherham Metropolitan Borough Council. The findings will help us develop our proposals to reduce impacts on the area.

Heritage

Our early work has identified that the overhead line diversion to connect into the proposed new substation would pass over Blue Man's Bower, a Scheduled Monument to the west of the site. While we don't anticipate construction will directly affect Blue Man's Bower, we'll work with the council and stakeholders to minimise any potential effects during the work and when the site is operational. Part of our planning application submission to Rotherham Metropolitan Borough Council will include a Construction and Environmental Management Plan. The plan will provide further details on our environmental management measures throughout the project.

Wildlife and nature

The site supports predominantly arable land and improved grassland, as well as boundary hedgerows. 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 Rotherham Metropolitan Borough Council on any required mitigation measures during the planning application process.

If we identify any protected species on the site, we'll remove any 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 approved, would be fully operational from 2031.

We expect to submit the North Humber to High Marnham DCO application in 2026 and, if approved, 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.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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 22 July 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 series of works near Brinsworth, as part of our Brinsworth to High Marnham project.

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're a landowner and want to talk to our lands team, 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**.

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May 2024