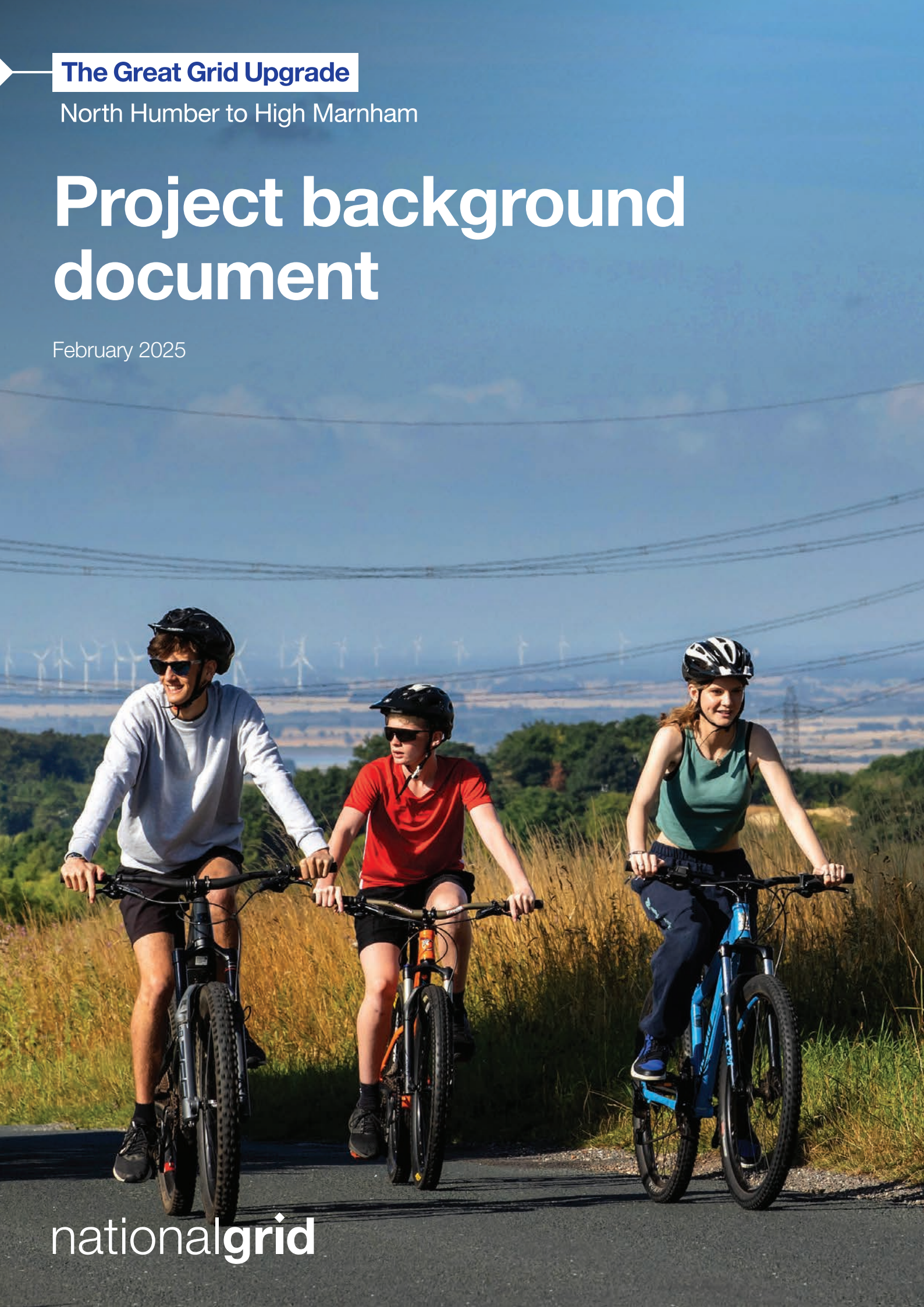
The Great Grid Upgrade

North Humber to High Marnham

Project background document

February 2025



nationalgrid

About National Grid and The Great Grid Upgrade

National Grid delivers electricity safely, reliably, and efficiently to the customers we serve – all while working towards building a cleaner, 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 with its own role and responsibilities across England and Wales.

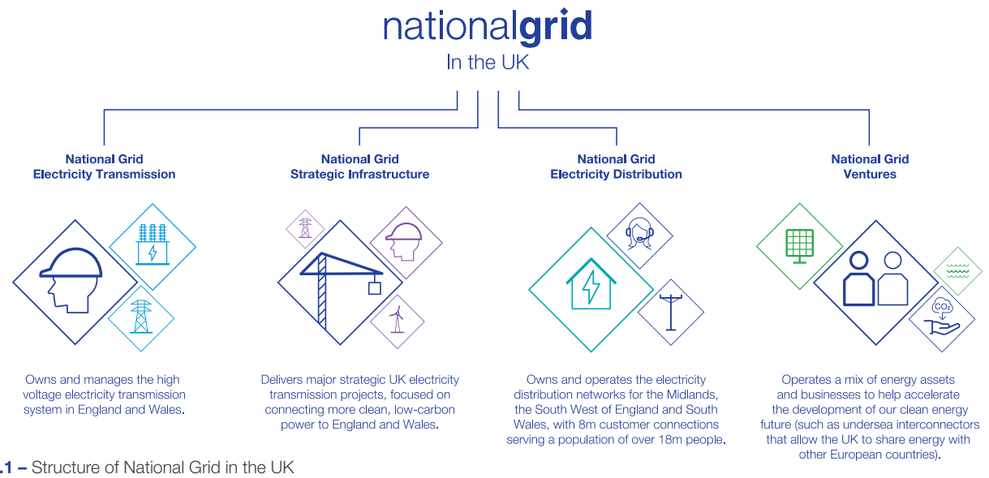


Figure 1.1 – Structure of National Grid in the UK

National Grid Electricity Transmission 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.

National Grid Strategic Infrastructure is developing the proposals for North Humber to High Marnham, which are 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, places and the environment. We have published 10 commitments to how we go about doing this in our Stakeholder, community and amenity policy[1].

National Grid Electricity Transmission's role

We don't generate electricity ourselves. We own and maintain the high voltage network in England and Wales. We transport large amounts of electricity at high voltage from where it is generated to where it is needed. The local network operators then deliver it at lower voltages to individual homes and businesses.

[1] National Grid's commitments when undertaking works in the UK: Our stakeholder, community and amenity policy (National Grid, December 2016) – Available at **https://www.nationalgrid.com/electricity-transmission/document/81026/download**

To find out more about how we develop our proposals, please see our video[2] explaining how we work.

Introducing The Great Grid Upgrade

The existing transmission system - the infrastructure including pylons, overhead lines and underground cables which transports electricity around the county - was largely built in the 1960s. It was not designed to transport electricity from where it is increasingly being generated today - offshore and from solar.

Electricity demand in Britain is forecast to at least double by 2050, increasing the amount of energy we need to transport to homes and businesses. Alongside this there has been huge growth in offshore wind, interconnectors and nuclear power which means that more electricity will be generated in the years ahead than the current network is able to transport securely and reliably.

New power lines are needed to meet the Government target of connecting 50 GW of offshore wind by 2030, enough to power every home in the country with clean, green and more affordable energy.

The Great Grid Upgrade is the largest overhaul of the grid in generations and will future proof the Grid for years to come, facilitating the transition to a clean and affordable energy future.

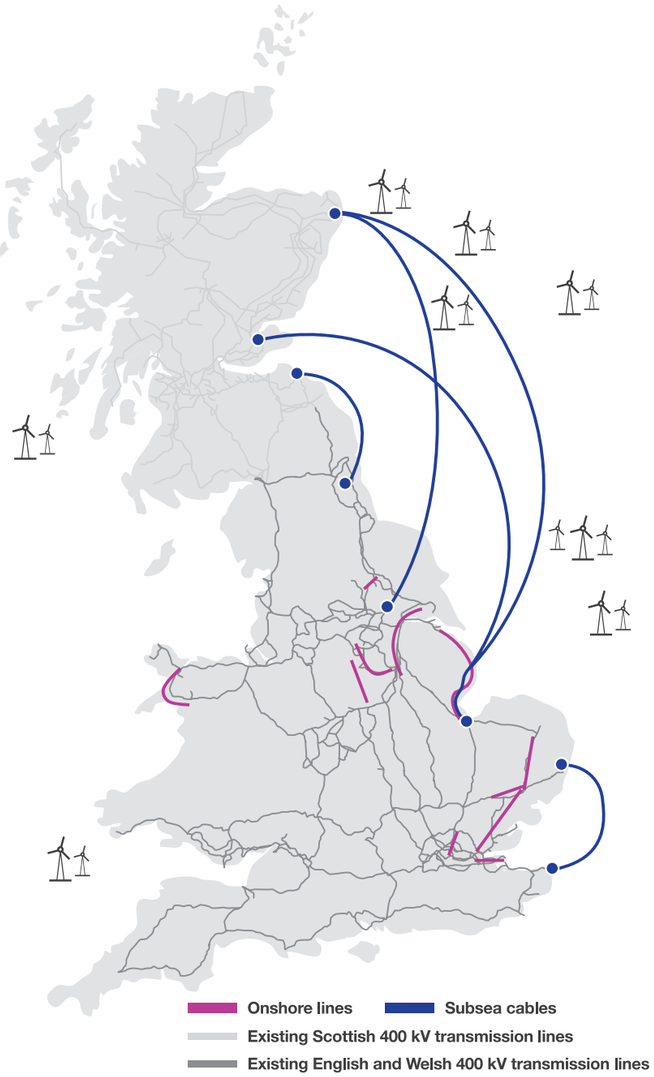


Figure 1.2 - Map of existing high voltage electricity transmission network and projects proposed as part of The Great Grid Upgrade

The Great Grid Upgrade will:

- Contribute to lower energy bills over the long term and make the UK's energy more self-sufficient.
- Support hundreds of thousands of jobs and contribute an average of £18.4 bn to GDP.

[2] How we work (National Grid) - Available at **players.brightcove.net/867903724001/default_default/index.html?videoId=6329276694112**

Contents

Foreword

Thank you for your interest in our proposals for upgrading the electricity grid in your local area. These proposals are key to delivering The Great Grid Upgrade.

Our proposals for North Humber to High Marnham will contribute to the UK's commitment to connect 50 GW of offshore wind by 2030 and 70 GW of solar power by 2035. It will help to meet government targets to reduce carbon emissions, increase our country's energy security and carry cleaner and more affordable energy to where it is needed.

North Humber to High Marnham is needed because it will reinforce the electricity transmission network and help to provide the increased capacity needed between the North of England and the Midlands.

Following our non-statutory consultation in Summer 2023 and localised non-statutory consultation in Summer 2024, we have developed our proposals and we are pleased to share these with you now and seek your feedback.

We encourage you to share your views on where the new infrastructure could be built and what you would like to see us consider as we finalise our proposals and prepare to submit our application for development consent to the Planning Inspectorate.

All documents published as part of this consultation, including this Project background document, can be found at **nationalgrid.com/nh-hm** and are available on request by contacting the project team at **contact@nh-hm.nationalgrid.com** or **0808 189 1346**.

We encourage everyone to take time to review our proposals, get in touch with any questions, and respond by **Tuesday 15 April 2025**.

Monica Corso Griffiths
Project Director, North Humber to High Marnham

Consulting on our proposals

North Humber to High Marnham meets the criteria to be classified as a nationally significant infrastructure project.

Other examples of nationally significant infrastructure projects include new airports, major roads, renewable energy projects and power stations. These types of projects require a special type of planning permission, known as a development consent order (DCO).

Consultation is an important part of the DCO process, as it enables everyone to comment on our proposals. Feedback from you – along with the outcome of technical assessments and environmental surveys – helps us to develop our proposals before we submit our DCO application to the Planning Inspectorate.

The Planning Inspectorate will review and examine our application and encourage the submission of views from statutory stakeholders such as local authorities, as well as communities and other interested parties. They will then make a recommendation to the Secretary of State for Energy Security and Net Zero, who will decide whether to grant consent.

This is our next stage of public consultation about our more detailed proposals for North Humber to High Marnham. You can read more about our previous non-statutory public consultations on the following page.

Our approach to consulting with communities

All infrastructure projects have impacts and benefits locally and nationally. We will consult and work with local residents, their representatives, and statutory stakeholders – such as local authorities - through all stages of the planning and construction process. Our aim is to minimise the impacts and maximise the benefits for local communities.

We want The Great Grid Upgrade to deliver social and economic benefits as well as providing a vital environmental service to Britain by decarbonising the electricity network.

Public consultation stages

Between 1 June 2023 and 27 July 2023 we held an initial non-statutory consultation to introduce our proposals for North Humber to High Marnham. This was an opportunity for you to learn about the project, ask questions and provide feedback on our early proposals.

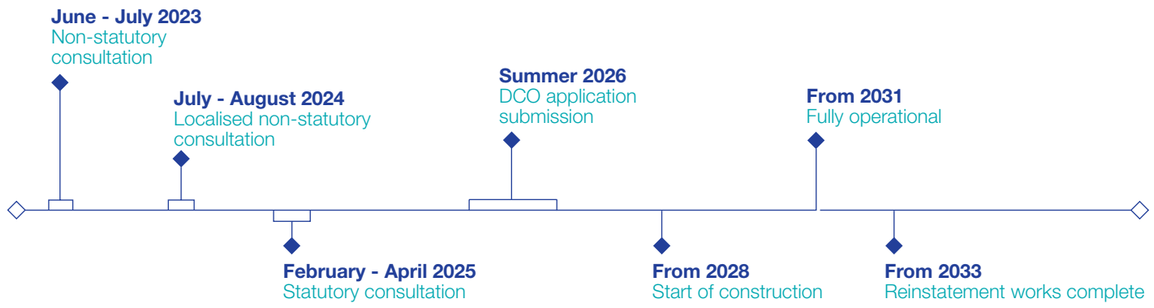
Between 9 July and 6 August 2024 we held a localised non-statutory consultation about a potential alternative corridor between South Wheatley and High Marnham. This is referred to as the Eastern corridor.

More information on the feedback we received to our previous consultations and our responses to feedback received can be found in our Non-statutory consultation feedback report, which is available in the Document library on our website at **nationalgrid.com/nh-hm**.

We have considered feedback from the local community, alongside our ongoing engagement with stakeholders, technical assessments and environmental surveys to further develop our proposals.

This statutory consultation is a further opportunity to share your views.

Project timeline



You can learn more about the feedback we received as part of our previous consultations and how we considered it as we developed our proposals in our Non-statutory consultation feedback report. This can be found in the Document library on our project website at nationalgrid.com/nh-hm.

Statement of community consultation

The Statement of community consultation (SoCC) is a document which sets out how we plan to engage with the community, including how and where there will be an opportunity for members of the public to get involved, ask questions, and submit feedback. We have worked with each of the local authorities in the project area to develop and agree the SoCC and you can view a copy in the Document library on our website.

What has changed since our non-statutory consultation?

Since the close of our non-statutory (1 June 2023 to 27 July 2023) and localised non-statutory (9 July 2024 to 6 August 2024) consultations, we have reviewed and carefully considered the feedback we received alongside the outcome of technical and environmental studies as we have developed our more detailed proposals.

This has been used to inform the development of our preferred route alignment and proposed pylon positions, and has resulted in several changes to our proposals.

What are we seeking feedback on now?

During this statutory consultation, we are seeking views on our updated proposals, including where the new infrastructure could be built and what you would like us to consider as we further develop the Project.

Our proposals for North Humber to High Marnham include a new 400 kV overhead electricity transmission line of an overall length of approximately 90 km between two proposed new substations, Birkhill Wood 400 kV substation and High Marnham 400 kV substation. The key elements of our proposals for consultation include:

- approximately 90 km of new overhead line between the new Birkhill Wood and High Marnham 400 kV substations
- replacement and realignment of a section of the existing 400 kV 4ZQ overhead line route between Brantingham and east of Broomfleet
- replacement and realignment of a section of the existing 400 kV ZDA overhead line route between Ealand and west of Keadby
- a new 400 kV Birkhill Wood substation with a new permanent access. This is proposed to be a gas insulated switchgear (GIS) substation
- replacement and realignment of a section of the existing 400 kV 4ZR route to allow for connection into the proposed new Birkhill Wood substation
- a new 400 kV High Marnham substation, with a new permanent access. This is proposed to be an air insulated switchgear (AIS) substation
- replacement and realignment of the existing 4ZV and XE 275 kV overhead line routes and existing 400 kV ZDA and ZDF overhead line routes, to allow for connection into the proposed new High Marnham substation
- other required works, such as temporary diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and ancillary works.

The Project would also include utility diversions and drainage works. There would also be land required for mitigation, compensation and enhancement of the environment, including for biodiversity net gain (BNG). We will be required to ensure a minimum 10 per cent BNG, which means our work needs to result in more, or better quality, natural environment than before development. This opens up real opportunities to use development to enhance our wild spaces and provide new habitats.

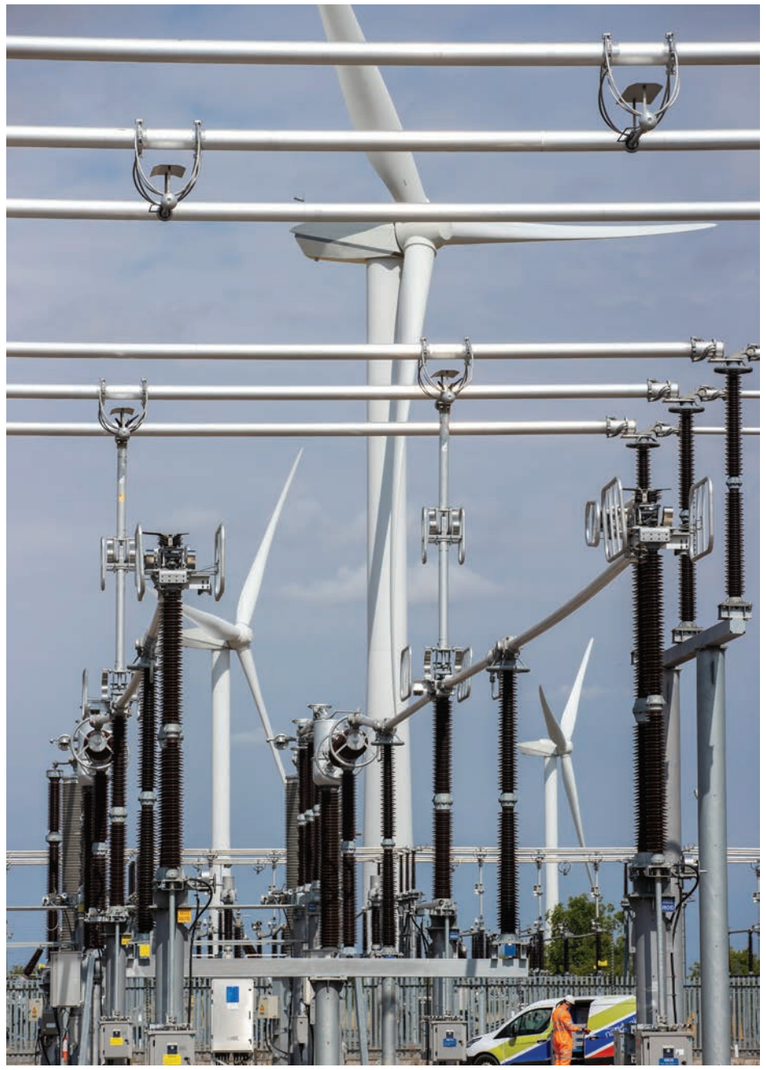
To help us and others when we refer to and work on infrastructure, we allocate this infrastructure identification codes. For example, the overhead line between Brantingham and east of Broomfleet is called “4ZQ”.

New substations

North Humber to High Marnham would need to connect to two new substations – one near the existing Creyke Beck 400 kV substation in Cottingham (known as Birkhill Wood substation) in the East Riding of Yorkshire, and a new substation at High Marnham in Nottinghamshire (part of a project called ‘Brinsworth to High Marnham’). Planning permission for each of these new 400 kV substations is needed from the relevant local planning authorities under the Town and Country Planning Act.

While the new substations did not form part of our proposals for North Humber to High Marnham during our non-statutory consultation, we have made the decision to include both substations within our statutory consultation. This approach allows National Grid to demonstrate that the Project can be delivered and that it can connect to the national electricity transmission network.

See the ‘Our proposals’ chapter for more information.



Our proposals are outlined in this Project background document, along with information about where to find out more and how to get involved in the consultation.

As part of this consultation, we have published:

- **Project background document:** provides an overview of the project, summarising our technical documents and providing information on how to take part in the consultation
- **Preliminary environmental information report (PEIR):** sets out the preliminary findings from the environmental studies and assessments we are carrying out to develop our proposals
- **Non-technical summary of the PEIR:** a summary of the PEIR in non-technical language
- **Design development report:** details the design work we have undertaken since the 2023 consultation
- **Community newsletter:** provides a high-level overview of our proposals and details of how to get involved in the consultation
- **Non-statutory consultation feedback report:** summarises the feedback we received during the non-statutory consultation in 2023 and localised non-statutory consultation in 2024 and how it has been considered
- **Strategic options report update:** an overview of our appraisal approach and strategic options considered
- **Interactive map:** online map of the preferred route alignment. A postcode or address can be entered to view pylon locations
- **Maps of our proposals:** overview map and individual section maps showing the preferred alignment, sectioned by geographical area, with further maps to highlight features considered as part of the routeing and siting process
- **Feedback questionnaire:** to gather consultation comments and feedback – can be completed online or in paper copy
- **Statement of community consultation (SoCC):** sets out how we are carrying out this consultation. The SoCC was developed in consultation with relevant local authorities.

All of these documents are available to download from our project website at **nationalgrid.com/nh-hm**.

Printed copies of most of our consultation documents are available free of charge on request. These can be requested by emailing **contact@nh-hm.nationalgrid.com** or by calling **0808 189 1346**. Some detailed technical documents may be subject to a printing charge. Paper copies of key consultation materials (the Project background document, Community newsletter and Feedback form) are available to take away at a number of locations close to the preferred route alignment during the consultation period. Reference copies of the Statement of community consultation and Non-technical summary of the PEIR are also available to view at these locations.

How to find out more

All consultation information is available on our website at nationalgrid.com/nh-hm.

Throughout the consultation we are holding a series of face-to-face events (see Table one). At these consultation events we will present information about our proposals and members of the project team will be available to answer your questions about our proposals. You will also be able to view copies of our maps and technical documents.

At our online webinar sessions, we will present our proposals and hold an open question and answer session. We are holding sessions on our proposals as a whole alongside more focussed, location-themed sessions (see Table two), so you can attend the webinar most relevant to you. Details on how to sign-up for a webinar are available on the project website at **nationalgrid.com/nh-hm** or by contacting us on **0808 189 1346** or **contact@nh-hm.nationalgrid.com**.

To learn more about our consultation and how to get involved, you can:

- read this Project background document
- visit our website at **nationalgrid.com/nh-hm**
- come to a consultation event (see Table one)
- join an online webinar session (see Table two)
- visit a local information point (see Table three)
- call us on our freephone **0808 189 1346**. Lines are open Monday to Friday 9am-5:30pm, with an answerphone taking messages outside of these hours
- email us at **contact@nh-hm.nationalgrid.com**.

To respond to the North Humber to High Marnham consultation:

- complete the online feedback questionnaire on our website at **nationalgrid.com/nh-hm**
- email your comments to **contact@nh-hm.nationalgrid.com**
- post your written responses (no stamp required) to: **Freepost NH TO HM**
- complete a printed feedback questionnaire and return it using the freepost address above.

Your comments must be received by **11:59pm** on **Tuesday 15 April 2025**.

Scan the QR code to be directed to our website. Here you can view all consultation materials, our interactive map and the online feedback questionnaire.

Table one: Public information events

We are holding a series of public information events at venues close to the preferred route alignment. These are drop-in events and will provide opportunities to view the proposals and speak to members of our team. The events will include display boards, large scale maps and technical documents. Printed copies of this Project background document and the feedback questionnaire will be available to take away.

Date and time	Venue
Saturday 1 March 2025 11am-4pm	Dunham on Trent Village Hall, Low Street, Dunham, NG22 0FJ
Monday 3 March 2025 1-7pm	Gringley on the Hill Community Centre, W Wells Lane, Gringley on the Hill, DN10 4QY
Tuesday 4 March 2025 1-7pm	North and South Wheatley Village Hall, Sturton Road, South Wheatley, DN22 9DL
Monday 10 March 2025 1-7pm	Crowle Community Hall, Woodland Avenue, Crowle, DN17 4LL
Friday 14 March 2025 1-7pm	All Saints Community Centre, Church Hill, South Cave, HU15 2EU
Saturday 15 March 2025 11am-4pm	Gilberdyke Memorial Hall, 11 Clementhorpe Road, Gilberdyke, HU15 2UB
Wednesday 19 March 2025 1-7pm	Garthorpe Village Hall, Shore Road, Garthorpe, DN17 4AD
Friday 21 March 2025 1-7pm	Epworth Imperial Hall, Chapel Street, Epworth, DN9 1HJ
Wednesday 26 March 2025 1-7pm	Cottingham Civic Hall, Market Green, Cottingham, HU16 5QF

Table two: Webinars

We are holding a series of one-hour online webinar sessions to present details of our proposals followed by a question-and-answer session. These include general overview webinars and location-themed webinars to allow you to attend the session which is of the most interest.

A recording of a general overview presentation will be available to view on our website after the first webinar session.

You can register to attend the webinars on our website. Alternatively, you can contact our community relations team on **0808 189 1346** or by email at **contact@nh-hm.nationalgrid.com**.

Date and time	Topic
Tuesday 25 February 2025 6:30-7:30pm	General – Overview of the proposals
Thursday 6 March 2025 6:30-7:30pm	Route sections 1, 2 and 3
Tuesday 11 March 2025 6:30-7:30pm	Route sections 4, 5, 6 and 7
Thursday 13 March 2025 6:30-7:30pm	Route sections 8 and 9
Tuesday 18 March 2025 6:30-7:30pm	Route sections 10 and 11
Thursday 27 March 2025 2-3pm	General – Overview of the proposals

Table three: Local information points

Paper copies of key consultation materials (the Project background document, Consultation newsletter and Feedback questionnaire) are available to take away at a number of locations close to the preferred alignment during the consultation period. Reference copies of the Statement of community consultation and Non-technical summary of the PEIR are also available to view at these locations.

Please check with the relevant venue for the most up-to-date opening times.

Location	Address	Opening hours	
Beverley library	Champney Treasure House, Champney Road, Beverley, HU17 8HE	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9:30am-4:30pm 9:30am-6:30pm 9:30am-4:30pm Closed 9:30am-4:30pm 9am-4pm Closed
South Cave Library	97 Church Street, South Cave, HU15 2EP	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	Closed 2-5pm Closed 2-7pm Closed 10am-12pm Closed
Goole Library	Carlisle Street, Goole, DN14 5DS	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9:30am-7pm 9:30am-5pm 9:30am-7pm 9:30am-5pm 9:30am-5pm 9am-4pm Closed
Cottingham Library and Customer Service Centre	Market Green, Cottingham, HU16 5QG	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9:30am-4:30pm 9:30am-4:30pm Closed 9:30am-6:30pm 9:30am-1pm 9:30am-12:30pm Closed
Crowle Library	The Market Hall, Crowle, DN17 4LA	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9am-12:30pm and 1-5pm 9am-12:30pm and 1-5pm 9am-12:30pm and 1-5pm 9am-12:30pm and 1-5pm 9am-12:30pm and 1-5pm 9am-12pm Closed
Nottinghamshire Mobile Library (North Route 11)	To find out when the mobile library is in your area, email **ask@inspireculture.co.uk** or call **01623 677 200**		

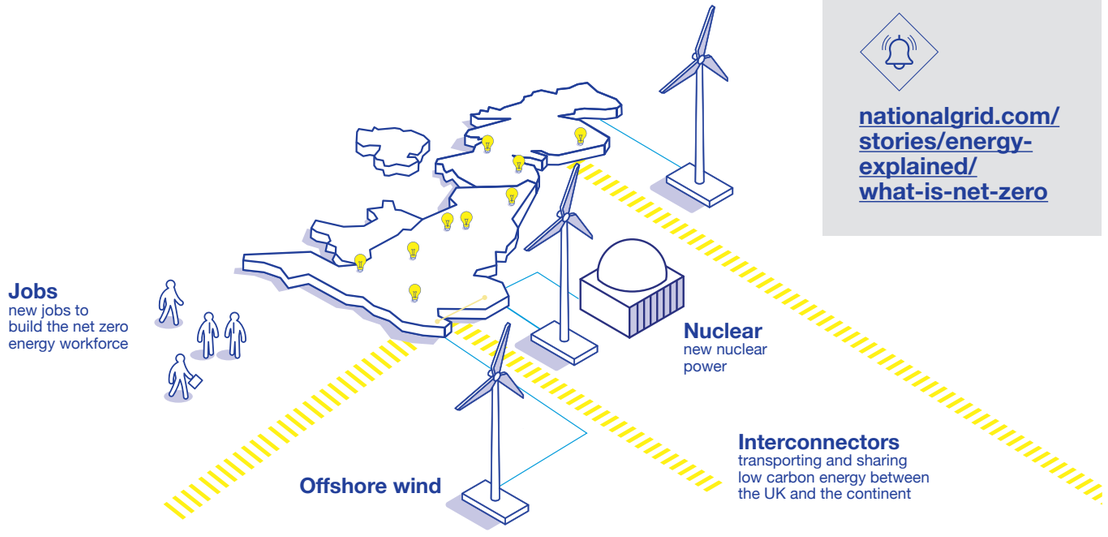
Location	Address	Opening hours	
Haxey Library	The Memorial Hall, Haxey, DN9 2HH	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	2-5pm 9am-12pm Closed 2-4pm 9am-12pm 10am-1pm Closed
Misterton Library	High Street, Misterton, DN10 4BU	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	Closed 2pm-5pm 2-5pm 2-5pm Closed 9:30am-12:30pm Closed
Retford Library	Churchgate, Retford, DN22 6PE	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9am-6pm 9am-6pm 9am-6pm 9am-6pm 9am-6pm 9am-3:30pm Closed
Bassetlaw District Council – Retford Office	17B The Square, Retford, DN22 6DB*	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9am-5pm 9am-5pm 9am-5pm 9am-5pm 9am-5pm Closed Closed
Epworth Library	Live Well Isle of Axholme, Burnham Road, Epworth, DN9 1BZ	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	7am-9pm 7am-9pm 7am-9pm 7am-9pm 7am-9pm 9am-4pm 12-6pm
Gainsborough Library	Cobden Street, Gainsborough, DN21 2NG	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	9am-5pm 9am-5pm 9am-5pm 9am-6pm 9am-5pm 9am-1pm Closed
All Saints Parish Church Misterton	High Street, Misterton, DN10 4AL	Monday Tuesday Wednesday Thursday Friday Saturday Sunday	10am-4pm 10am-4pm 10am-4pm 10am-4pm 10am-4pm 10am-4pm 10am-4pm

* Bassetlaw District Council's Retford Office is operating from a temporary location until late-February 2025. For more information, visit the Council's website.

The need

The UK has set a world-leading target for tackling climate change: to achieve net zero carbon emissions by 2050.

This means that we will remove the same amount of greenhouse gases from the atmosphere as we produce. The Great Grid Upgrade will connect clean energy that's produced right here in the UK, increasing the self-sufficiency of our energy supplies.



nationalgrid.com/stories/energy-explained/what-is-net-zero

While the way electricity is generated is changing, demand is also set to significantly increase as the way we power our homes, businesses, industry and transport changes. As the nation moves towards net zero, the fossil fuels that once powered our economy will continue to be replaced with sources of low-carbon electricity. Meeting government targets will be a major step towards decarbonising our economy and providing customers with clean, secure, and affordable energy.

To deliver more clean power to homes and businesses and increase our energy security, we must also upgrade the transmission system – 'the grid'. Delivering the infrastructure needed to achieve this ambition will boost local economies, provide jobs and opportunities to learn new skills and bring vital investment to towns right across the country. North Humber to High Marnham will reinforce the electricity transmission network and help to provide the increased capacity between the North of England and the Midlands.

The electricity transmission network today in the region

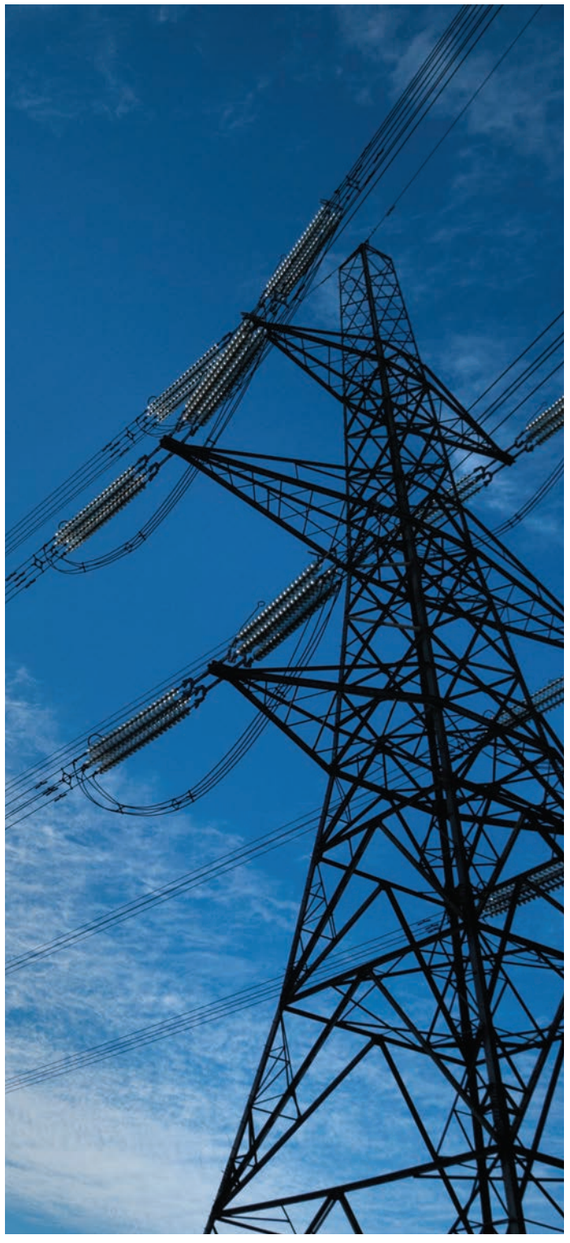
Like much of the high voltage electricity transmission network across the country, the network between the North and the Midlands was largely built in the 1960s, carrying electricity down from Scotland and the North, connecting coal fired generation in the Aire and Trent valleys with the main centres of population.

In the area north of the Humber, the network was initially developed to supply demand in and around Hull and the wider area. Two 400 kV overhead lines, each carrying two electrical circuits, connect Creyke Beck, near Cottingham, north of Hull. Creyke Beck and Salt End North are grid supply points where the local distribution network operator, Northern Powergrid, reduces the voltage to take electricity on, via their lower voltage distribution network, to homes and businesses.

In the late 1990s, gas fired generation at Salt End, east of Hull, was connected back to the transmission network at our Creyke Beck substation, via a new 275 kV overhead line from Salt End South substation. Creyke Beck and Hedon are also connection locations for existing offshore wind farms.

In the Trent Valley, the electricity transmission network was built to connect major coal fired generation at Keadby, Cottam, Staythorpe, West Burton and High Marnham, carrying electricity on towards major population centres. Electricity still flows primarily from the North to the Midlands through the region today.

A watt is a measure of power and there are 1 billion watts in 1 GW. 1 GWh 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.



Why does the network in the region need reinforcing?

With growing offshore wind and interconnectors, an anticipated tripling of wind generation connected across the Scottish networks by 2030 and the Government's increased ambition to connect 50 GW of offshore wind by 2030, north-south power flows are set to increase. If all of the proposed new offshore wind that is planned to connect in the Creyke Beck area gets built, this would amount to just under 12 gigawatts (GW) of generation capacity by the early 2030s.

Interconnectors are high voltage cables that are used to connect the electricity systems of neighbouring countries.

The existing network serving the Creyke Beck area can export just under 7 GW of electricity while remaining compliant with the Security and quality of supply standards to which the network is operated.

The Security and quality of supply standards are guidelines and requirements that we must follow to ensure that electricity is delivered reliably and efficiently. For example they ensure electricity flows without interruption in the event of faults and is within accepted tolerances, such as voltage and frequency.

The network as it is today would not have the capacity needed to export the significant forecast increase in contracted generation out of the area or to accommodate the north–south power flows that are expected on the network. We need to increase the capability of the electricity transmission network between the north of England and the Midlands.

The high voltage electricity transmission network in England and Wales operates largely at 400 kV and 275 kV. It connects separately owned generators, interconnectors, large demand users fed directly from the transmission system and the lower voltage distribution networks.

Most lines of pylons on the network carry two electrical circuits. The network is planned and operated under a set of standards designed to ensure there are no widespread electricity supply interruptions, even if two circuits are out of service. Before we build new infrastructure, we make sure we have done everything possible to get greater capability out of the existing network, including to accelerate the connection of clean energy projects. While there are several network upgrade projects planned, North Humber to High Marnham is an essential new reinforcement that forms part of The Great Grid Upgrade and is one of 17 network reinforcements identified as 'essential' and which need to be accelerated to meet 2030 targets.

Without these upgrades, the network won't have the capacity that is needed to move electricity from where it is produced to where it is needed. Therefore, we need to upgrade it to maintain system compliance and prevent overloading circuits as they transport the energy that is generated. The Project would support the UK's net zero targets by adding capacity to accommodate increasing power flows of energy. This is 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.

Increasing network boundary capability

To understand current and future demands on the electricity network, the concept of network boundaries is used. A boundary splits the system into sections and shows where there are high power flows between parts of the network. When flows across a network boundary are forecast to be above the capability of the network, there are two options to manage this:

- pay electricity generators to reduce the energy they produce in one part of the country while paying others elsewhere to generate. These are called 'constraint payments'
- increase the capability of the network to allow more electricity to flow.

Balancing the network by using constraint payments can temporarily manage power flows where network capability is insufficient, but it increases operation costs as more expensive generation is brought on. This can be an economic way to manage the network up to a point, if constraint costs are not disproportionate. Where constraint costs are substantial, the network becomes uneconomic to operate. It then becomes necessary to invest in increasing network capability.

Transmission boundary B8 runs east to west, separating the northern generation zones, including Scotland, Northern England and North Wales, from the Midlands and southern demand centres.

We need to reinforce our network to prevent system failures and circuit overloads from happening.

Wider reinforcements on the B8 boundary

Over the next decade works are planned to increase capability across the B8 electrical transmission boundary. These works include replacement of existing wires overhead and underground cables, increasing power transmission capability and installing equipment to improve the efficiency of the existing network.

While those works will increase the amount of electricity that can be transferred across boundary B8 to around 16 GW, they will not be sufficient to accommodate the north-south power flows that are expected on the network.

Up to around 28 GW of boundary transfer capability is needed by 2035 across the B8 boundary with increasing offshore wind and interconnectors. Our North Humber to High Marnham proposals will help the transition to clean energy, making sure the grid is ready.

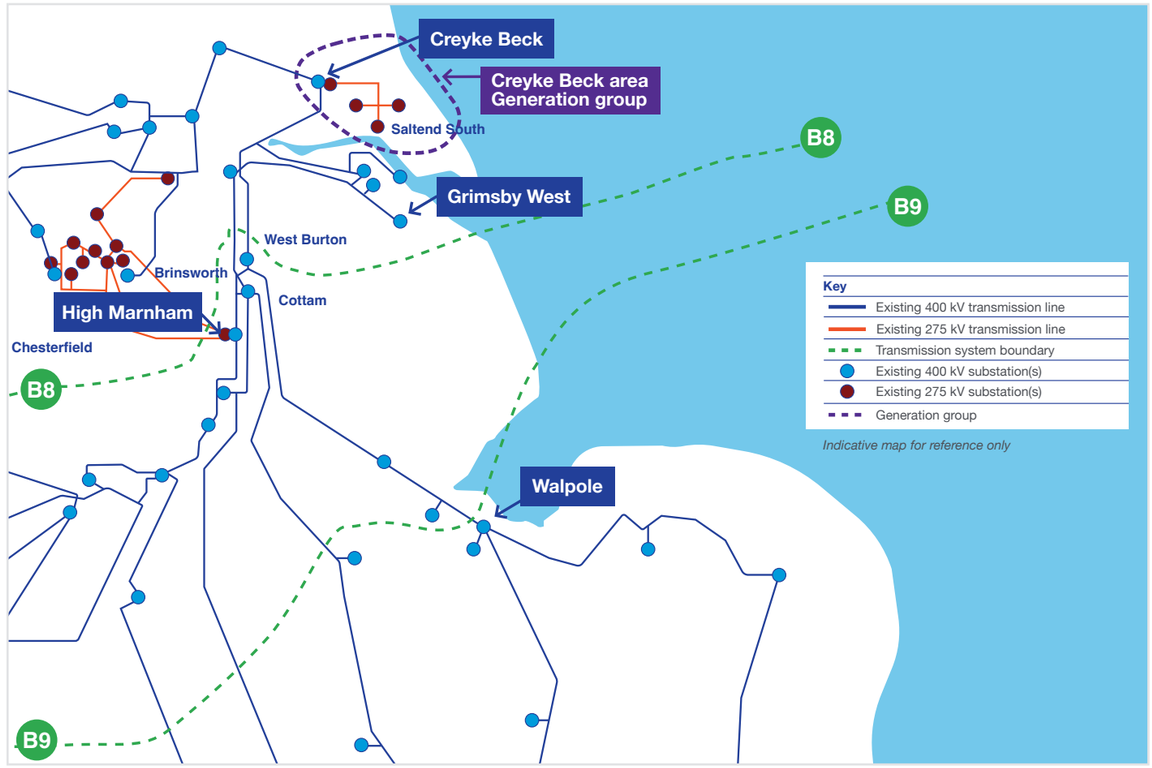


Figure 1.3 – map showing the B8 and B9 transmission boundaries

Our proposals

This section describes our proposals for a new high voltage electricity transmission line and associated works between the new Birkhill Wood substation north of Hull at Creyke Beck in East Riding of Yorkshire and the new High Marnham substation in Nottinghamshire.

This includes a new 400 kilovolt (kV) electricity transmission connection of an overall length of approximately 90 km between two proposed new substations, Birkhill Wood 400 kV substation and High Marnham 400 kV substation.

This proposed reinforcement is required to increase the capability of the electricity transmission network between the north of England and the Midlands. It is also needed to facilitate the connection of proposed new offshore wind farms that are planned in the area.

In our non-statutory consultation held in 2023, we introduced the need to build new electricity transmission infrastructure in the area and presented a 'corridor' showing where the new infrastructure could be built. In 2024 we held a localised non-statutory consultation on a potential alternative corridor known as the 'eastern corridor' between South Wheatley and High Marnham.

Following each consultation we have carefully considered all the feedback received and used it to help inform decisions on the overall preferred corridor and preferred alignment that we are now seeking your views on. We've summarised the process for identifying the preferred alignment in this section, and any changes to the corridor presented at our non-statutory consultation. More information is available in the Design development report.

At our non-statutory and targeted non-statutory consultations, we showed a preferred option corridor. This included a graduated swathe, which indicated an area within which the overhead line could be routed. The corridor area was darker where an alignment was more likely, and lighter where it is less likely.

As part of our statutory consultation, we have developed our preferred option corridor into a preferred route alignment. Where our preferred route alignment deviates from the corridor shown previously, we have explained the reason(s) for the change.

South Wheatley to High Marnham corridor decision

Following our non-statutory consultation in 2023, we reviewed all consultation feedback and undertook a review of our technical work[4] on the corridor route and siting to take into account new information, including consultation feedback and design and assessment work. As a result of this further work, we identified a potential alternative corridor referred to as - 'the eastern corridor' - in the southernmost section of the route, between the villages of South Wheatley and High Marnham. For ease of reference, the section of the emerging preferred corridor between South Wheatley and High Marnham presented during non-statutory consultation in 2023 is referred to as the 'western corridor'.

A localised non-statutory consultation was held in July and August 2024 to obtain feedback on the eastern corridor. To support and inform the localised non-statutory consultation events, an appraisal was undertaken on the eastern corridor which covered a range of criteria such as environmental, socio-economic, technical and cost factors[5].

Further technical and environmental assessment work, together with feedback from both the 2023 and 2024 consultations has informed a decision on the overall preferred corridor between South Wheatley and High Marnham, within which the preferred alignment has been identified and presented for this statutory consultation.

Whilst there would be some reduction in landscape and visual effects routeing within the eastern corridor, largely due to the existing baseline being defined by the presence of existing energy transmission infrastructure, in the absence of landscape designations in either eastern or western corridors it is not considered that the western corridor is unfeasible. Routeing within the western corridor would help to avoid the potential for adverse cumulative impacts with the existing converging and diverging overhead lines as originally concludes in the CPRSS and in accordance with Holford Rule 6. As it is not feasible for the new overhead line to run parallel with the existing overhead lines in the Trent Valley due to existing constraints, any visual benefits associated with a continuous triple parallel alignment in this location cannot be achieved through routeing in the eastern corridor.

Large sections of the eastern corridor are within areas of flood zone 3, compared to the western corridor, which has almost no areas at higher risk of flooding. Routeing within the eastern corridor could increase the risk of programme delays should flood events occur during the construction period and working restrictions be required. Routeing within areas at higher risk of flooding would also likely require complex foundation designs which increases technical complexity resulting in possible programme delays and increase in cost.

The increased presence of consented renewable developments within the eastern corridor compared to the western corridor increases costs from a land rights and compensation perspective due to the need to negotiate with landowners and developers who may have already incurred capital expenditure related to their consented projects. Compensation may be required not only for restrictions on the future development potential of these projects but also to account for investments already made, such as planning, infrastructure, and preliminary construction costs.

National Grid develops its projects in accordance with its statutory duties under the Electricity Act 1989 to be economic, efficient and have regard to the environment and amenity and national planning policy. When balancing the technical, environmental, socio-economic and cost considerations it was considered the western corridor is preferred and would best meet National Grid's duties and obligations.

Further detail on the South Wheatley to High Marnham corridor decision can be found in the Design development report.

[4] More information can be found in the Supplementary corridor routeing report (SCRR) on the Document library section of our website **nationalgrid.com/nh-hm**.

[5] More information can be found in the Corridor preliminary routeing and siting study (CPRSS) on the Document library section on our website at **nationalgrid.com/nh-hm**.

Substations

Consultation on new substations

The project would need to connect to two new substations – one at Creyke Beck in Cottingham, (known as Birkhill Wood substation) in the East Riding of Yorkshire and a new substation at High Marnham in Nottinghamshire (part of a project called 'Brinsworth to High Marnham').

Planning permission for these new 400 kV substations needs to be obtained from the relevant local planning authorities under the Town and Country Planning Act 1990. Separate public consultations have been held for each of these projects.

Consultation on proposals for a new gas insulated switchgear substation located approximately 700 metres to the north of the existing Creyke Beck substation was held in July 2023. A planning application is being submitted to East Riding of Yorkshire Council for the new Birkhill Wood substation in 2025. You can read more about the proposed new Birkhill Wood substation, previous consultation and latest updates on their project website at **nationalgrid.com/creyke-beck**.

Consultation on the proposals for a new air insulated switchgear substation at High Marnham, Nottinghamshire, took place in April and May 2024 as part of a project called Brinsworth to High Marnham. A planning application will be submitted to Bassetlaw District Council for the new High Marnham substation in 2025. You can read more about the proposed new High Marnham substation, previous consultation on Brinsworth to High Marnham and latest updates on their project website at **nationalgrid.com/brinsworth-highmarnham**.

In addition to connecting the new overhead line reinforcement which North Humber to High Marnham will provide, the substations are also needed to provide a connection point for third-party developments to connect into the transmission network in the Cottingham and High Marnham areas. Once the planning applications for each substation have been submitted to the local planning authorities, you may submit comments directly to the relevant local planning authority regarding these planning applications.

Inclusion of the new substations in the North Humber to High Marnham statutory consultation

While the new substations did not form part of our proposals for North Humber to High Marnham during our non-statutory consultation, we have made the decision to include both substations within the statutory consultation for the North Humber to High Marnham project. This approach allows National Grid to demonstrate that the project can be delivered and that it can connect to the national transmission network.

National Grid is obligated to meet certain timescales for the delivery of the network reinforcement through the proposed new 400 kV overhead line, and the substations are integral to this.

The inclusion of the substations within the North Humber to High Marnham project does not change our intention to continue to progress with the separate planning applications for each substation, and it does not affect our continuing discussions and negotiations with relevant landowners and interested parties. We are committed to, and fully intend to pursue and deliver, the substations in line with relevant planning permissions and land agreements.

National Grid will continue to keep the project consenting approach under review as the project progresses. The new proposed substations will play an important role in building a more secure and resilient future energy system.

There are primarily two different types of substation - one uses air to insulate the electrical components (air insulated switchgear, or AIS) and the other uses gas to insulate the electrical components (gas insulated switchgear, or GIS). AIS substations require more space between the equipment, so occupy a larger footprint than the GIS equivalent. The decision on which type of substation we construct depends on several factors, including availability of space, potential environmental impacts, cost, safety and maintenance requirements.

Overhead line and pylons

We are proposing a new 400 kV electricity transmission connection of approximately 90 km running between Birkhill Wood substation and High Marnham substation.

New pylons and conductors (electrical wires) would be located along the overhead line route. We have not decided on exactly what type of pylon we will use. Standard steel lattice pylons are being considered and these are common across the electricity system in the UK in line with the national policy statements for energy. These are typically around 50 m high with three sets of cross arms. The preferred alignment routes parallel with and close to existing 400 kV overhead lines (referred to as 'close parallel') in several locations, thus limiting the geographic spread of environmental and socio-economic impacts associated with the new overhead line infrastructure. The opportunities and benefits for close parallel alignment along the route are also influenced by local factors (e.g. topography, settlement pattern, woodland cover). The optimum level of benefit is likely to result from lines that, as stated in Holford Rule 6, are planned with pylon types, spans and conductors forming a coherent appearance. As such, lattice pylon types to match the existing 400 kV overhead line infrastructure in this area are preferred.

On straight sections of the route there would be approximately three pylons per kilometre, with slightly more on occasions. In some locations, specific features, such as navigable river crossings, can require taller pylons to ensure safe electrical clearance from the electrical conductors (wires).

The suitability of other pylon designs is being reviewed and considered, with our assessment to date concluding that T-pylons would not be suitable. You can read more about this in the Design development report.

The Holford Rules are guidelines on overhead line routeing that were developed by Lord William Holford in 1969. They set out the steps that National Grid uses as its basis when deciding where and how to route new overhead lines, such as by seeking to avoiding the areas of highest amenity value. Specifically, Rule 6 sets out guidance around where new overhead line infrastructure will interact with existing infrastructure.

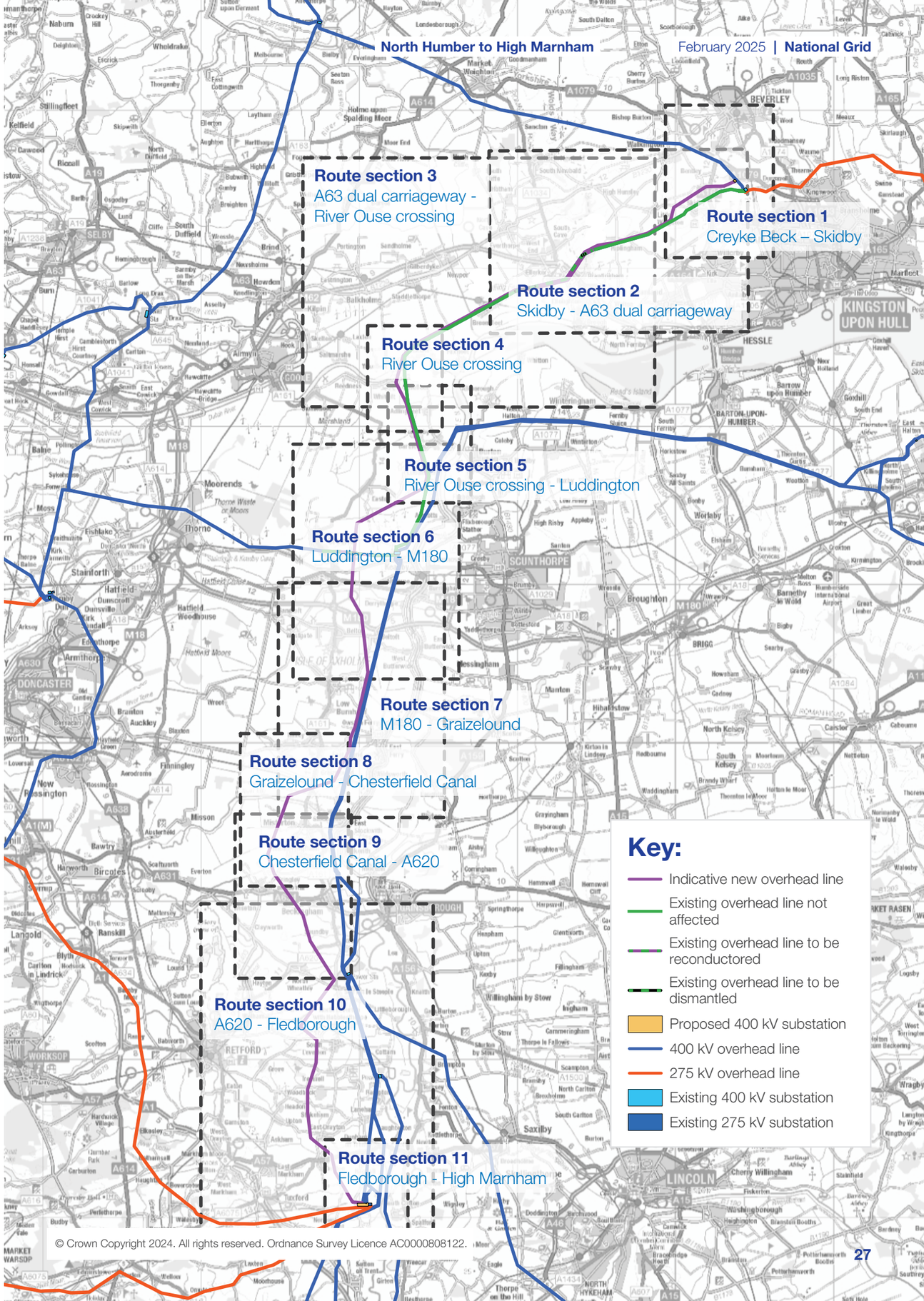
Proposals by location

Our preferred alignment has been split into 11 Route sections to make it easier for people to give feedback about any particular areas that they may wish to comment on. The sections are the same as used at our non-statutory consultation. Summaries of the proposals for Route sections 1 to 11, including maps, key issues and constraints, are included on the following pages.

- **Route section 1:** Creyke Beck - Skidby
- **Route section 2:** Skidby - A63 dual carriageway
- **Route section 3:** A63 dual carriageway - River Ouse crossing
- **Route section 4:** River Ouse crossing
- **Route section 5:** River Ouse crossing - Luddington
- **Route section 6:** Luddington - M180 motorway
- **Route section 7:** M180 motorway - Graizelound
- **Route section 8:** Graizelound - Chesterfield Canal
- **Route section 9:** Chesterfield Canal - A620 east of North Wheatley
- **Route section 10:** A620 east of North Wheatley - Fledborough
- **Route section 11:** Fledborough - High Marnham.

Information about the two new substations is included in Route section 1 for Birkhill Wood substation, and Route section 11 for High Marnham substation.

To view all indicative pylon locations (each pylon has been allocated a number), you can use our interactive map available on the Project website - **nationalgrid.com/nh-hm**, the Design development report 2025, and our Project maps.



Substation
Birkhill Wood

The new Birkhill Wood substation is required to enable new sources of electricity to connect into the grid, including the proposed Dogger Bank South and Dogger Bank D offshore windfarms. The new substation would also serve as the connection point for the North Humber to High Marnham Project.

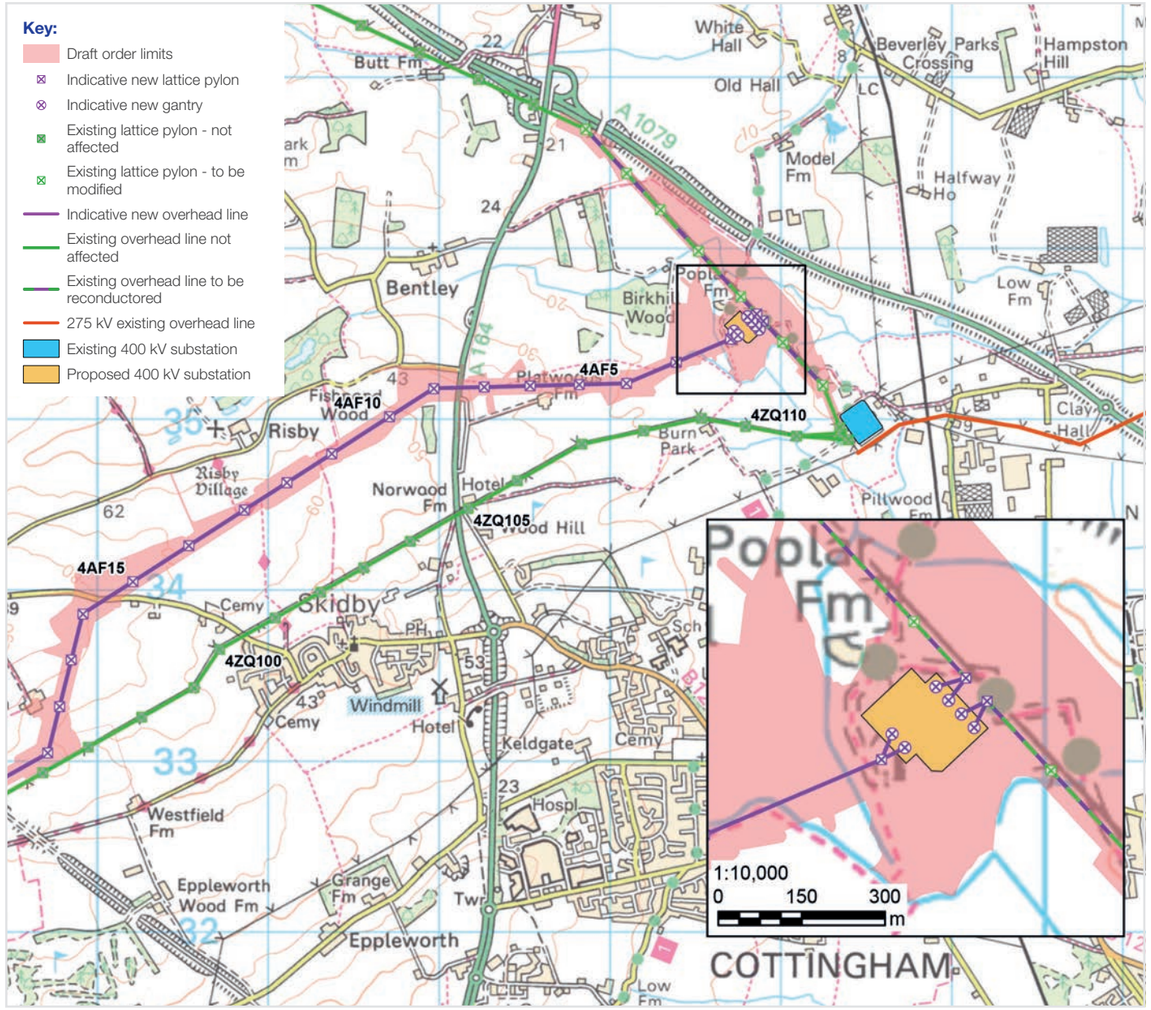
The proposed Birkhill Wood substation is located approximately 700 m to the north of the existing Creyke Beck substation. A 1.2 km temporary and permanent access road is proposed from the A1079 which would require two new permanent culverts for the crossing of two field drains. Three construction compounds / laydown areas are proposed. As part of the substation works there is a requirement to turn in the existing 4ZR 400 kV overhead line into the proposed new substation.

Construction compounds will be used to support construction work and day-to-day operations activity during the construction phase of North Humber to High Marnham.

Large compounds may include temporary offices, toilets and equipment storage areas, while smaller compounds will be used for equipment deliveries and short-term storage near to construction areas. All construction compounds will be removed at the end of the construction phase of the Project.

Route Section 1
Creyke Beck – Skidby

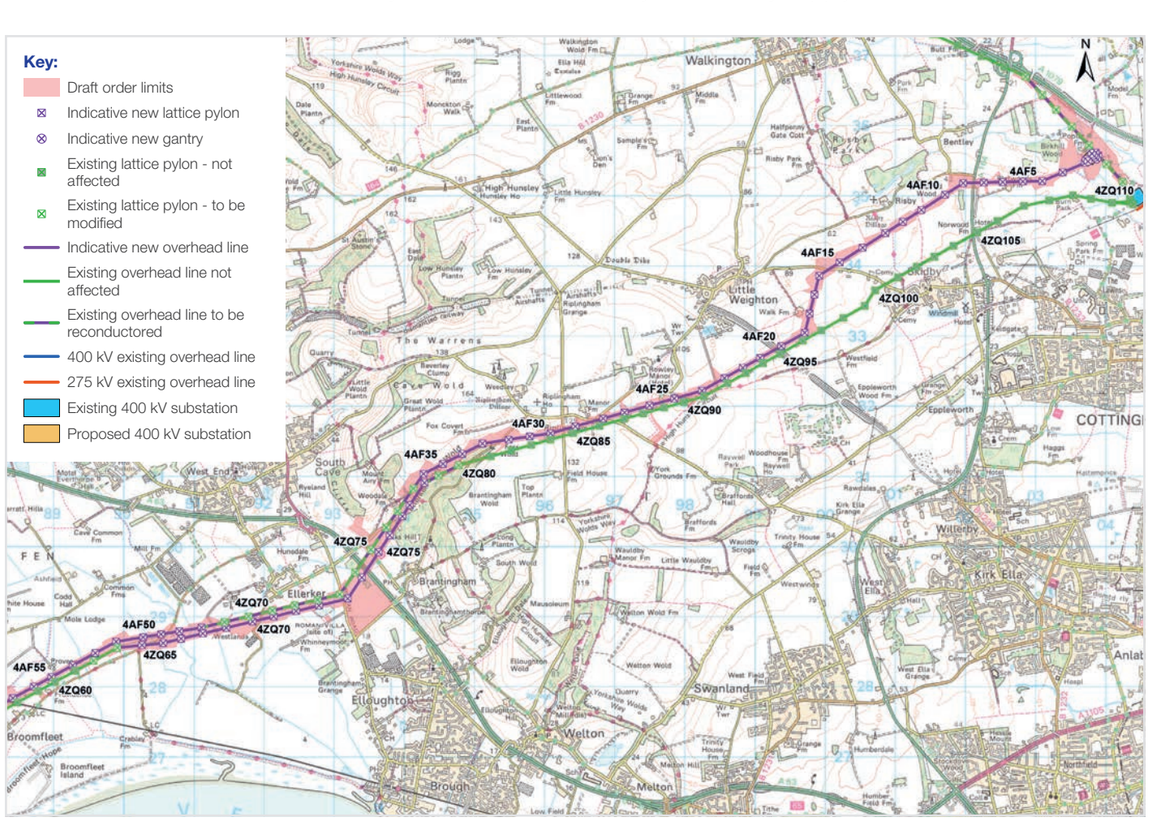
From the proposed new Birkhill Wood substation, the preferred alignment routes west for approximately 1.6 km from the proposed Birkhill Wood Substation to the crossing of A164 Beverley Road passing to the south of Jillywood. From the crossing of A164 Beverley Road the preferred alignment is then routed to the southwest for a further 1.5 km to the north of Platwoods Bar Plantation and the settlement of Skidby and south of Dunflat Road.



Route section 2
Skidby - A63 dual carriageway

Continuing from Route section 1 the preferred alignment is routed southwest for approximately 1.1 km, crossing Little Weighton Road to proposed pylon 4AF16. From proposed pylon 4AF16 the preferred alignment is routed south for approximately 850 m to proposed pylon 4AF19. From pylon 4AF19 the preferred alignment is routed southwest to the south of the settlement of Little Weighton and in close parallel with the existing 4ZQ 400 kV overhead line for approximately 6.1 km, crossing Riplingham Road to the south of the junction with Rowley Road, Lambwell Hill and Dale Road. From here the preferred alignment routes to the north of Brantingham Dale SSSI to proposed pylon 4AF37.

In Route section 2 and continuing to Route section 3 there is a line swap-over, starting at Ellerker North Wold. The preferred alignment will connect onto the existing 4ZQ overhead line from new pylon 4AF36 onto existing pylons 4ZQ68-78, which will require modification of the existing 4ZQ pylons and renaming to 4AF37-4AF47. The line swap-over work will require a temporary diversion of the existing 4ZQ overhead line and a sequence of outages on the electricity transmission network, in order to ensure works can be carried out safely and to ensure continuity of electricity supply.



Changes in Route section 1 and 2 since our non-statutory consultation

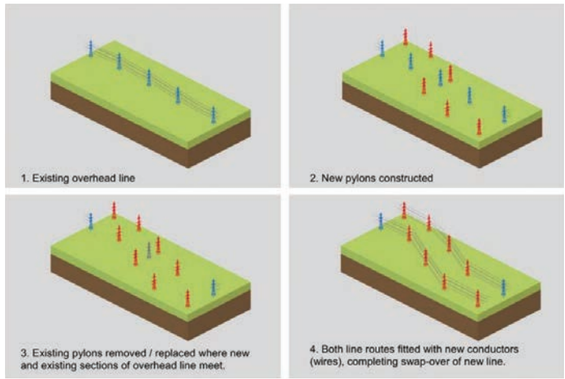
To overcome technical complexities and increase flexibility of routeing, we are now proposing that a short part of the preferred alignment in Route sections 1 and 2 would be slightly further north than the emerging preferred corridor shown at our non-statutory consultation.

Routeing further north in this location increases the distance from an existing high pressure gas pipeline and 33 kV distribution overhead line, reducing construction and operational safety risk and keeping the preferred alignment broadly equidistant between Little Weighton and Skidby.

The preferred alignment would come back within the preferred corridor before taking a northern route parallel to the existing 400 kV overhead line, reducing potential visual impacts.

Continuing in Route section 2 the preferred alignment routes outside of the emerging preferred corridor for three proposed pylon locations at Brantingham Dale, to the north west of Dale Road. This is to facilitate a line swap-over which requires a temporary diversion of the existing 4ZQ overhead line. Following review of consultation feedback an alternative line swap-over design is now proposed in this location, where the line swap-over between the new and existing lines would occur at the top of Ellerker North Wold rather than at the foot of the scarp slope as presented during our non-statutory consultation. This swap over position would allow more of the new overhead line to be routed in close parallel to the existing 4ZQ overhead line, where the two lines descend the scarp slope from the Wolds. Despite requiring the removal of a strip of plantation woodland at Bilks Hill, it is considered that this close parallel alignment would help reduce the scale of landscape impacts in this sensitive section of the Yorkshire Wolds Important Landscape Area. This line swap-over also enables the preferred alignment to be routed to the south of Ellerker and avoids the need for overhead lines both north and south of the village in accordance with feedback received during the non-statutory consultation.

A line swap-over is proposed between Route sections 2 and 3. This is where a length of existing overhead line is removed, allowing the two newly formed ‘ends’ of existing overhead line to be connected to two lengths of new overhead line. The two resultant routes would then both comprise of lengths of newly built and existing overhead line, as explained further in the illustration.



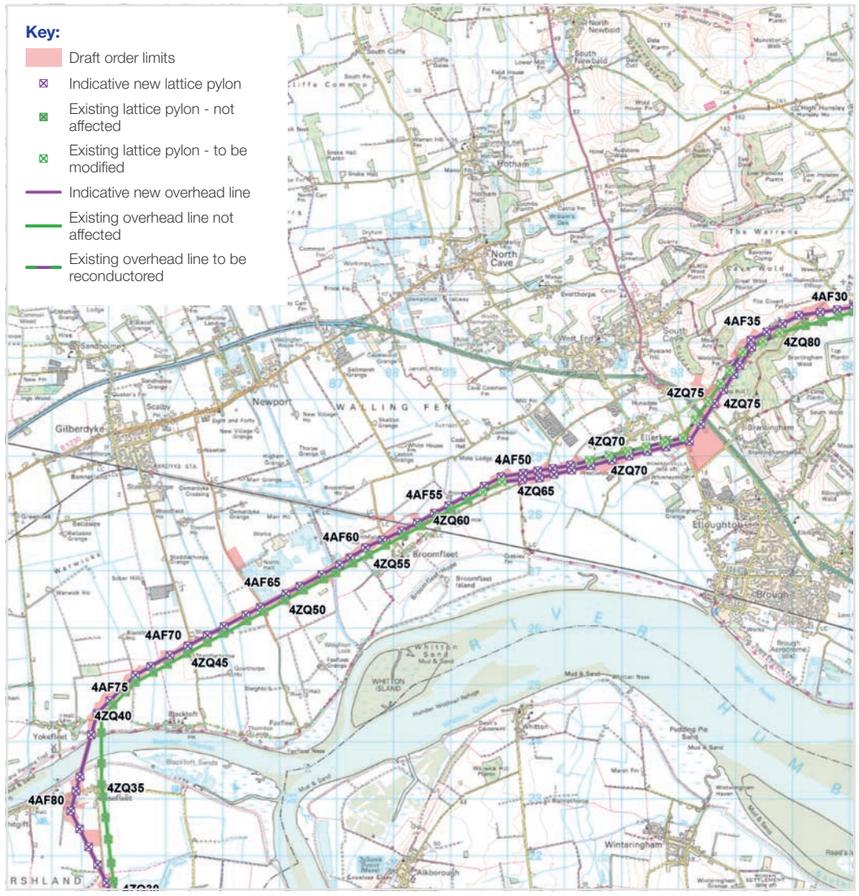
To help us and others when we refer to and work on infrastructure, we allocate this infrastructure identification codes. For example, the overhead line between Brantingham and east of Broomfleet is called “4ZQ”.

Route section 3
A63 dual carriageway - River Ouse crossing

From the start of this Route section at the crossing of the A63, the preferred alignment is routed to the south of existing 4ZQ overhead line and south of the settlement of Ellerker.

A line swap-over then takes place to the west of Ellerker, which leads to the preferred alignment routing to the north of the settlement of Broomfleet, in close parallel to the north of the existing 4ZQ overhead line and in accordance with consultation feedback received during the non-statutory consultation. Four of the existing 4ZQ pylons will be removed as they will no longer be required once the line swap-over is completed.

The preferred alignment is then routed in a south westerly direction crossing Brough Road, Sands Lane, Ings Lane, the Selby to Hull railway line, Carr Lane, Landing Lane, Market Weighton Canal, Tongue Lane and Staddlethorpe Broad Lane to the end of this Route section at Blacktoft Lane.



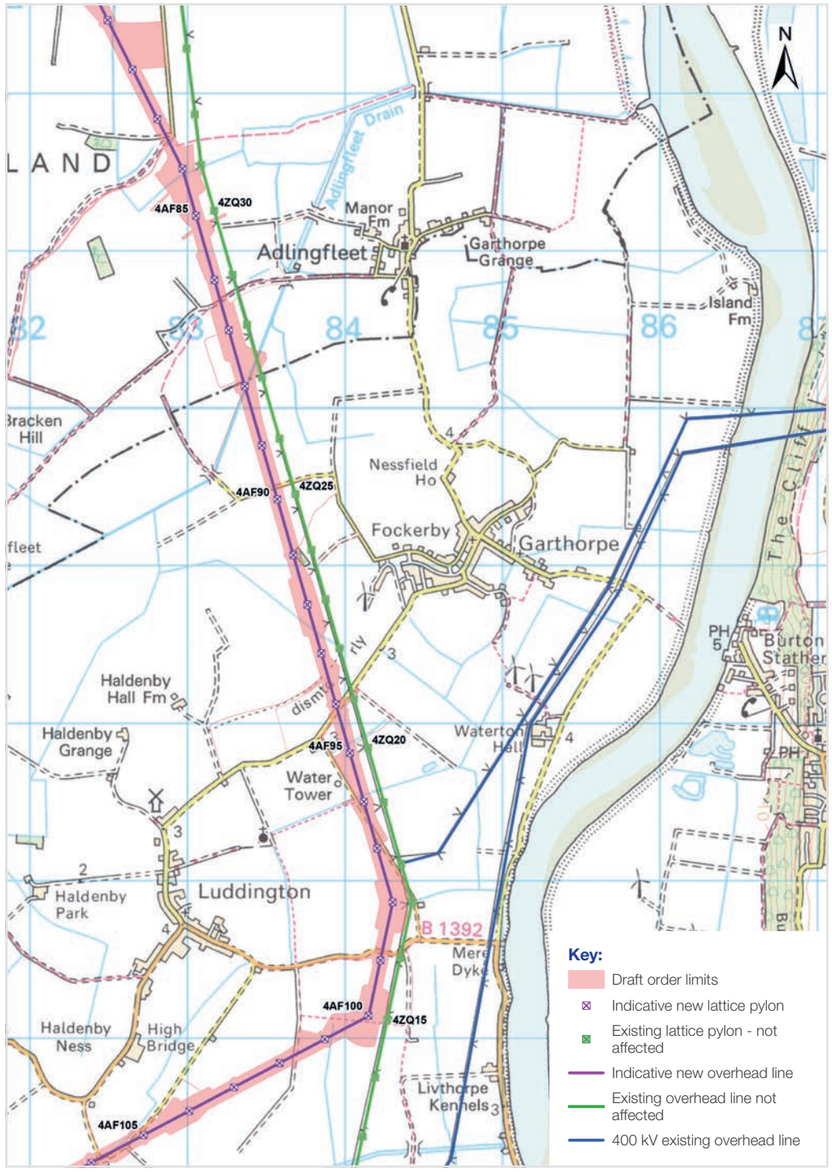
Route section 4
River Ouse crossing

From the start of Route section 4 at Blacktoft Lane the preferred alignment is routed in a general southerly direction crossing the River Ouse and Townend Causeway between the settlements of Ousefleet and Whitgift to the southern extent of this Route section at Narrow Lane.
The preferred alignment remains broadly parallel with the existing overhead line in this Route section, however, the new overhead line deviates from being in close parallel in order to avoid oversailing properties within the settlement of Ousefleet and Hall Garth moated site Scheduled Monument.

In Route section 4 proposed pylons 4AF77 and 4AF78 would be bespoke pylons, which will be taller in height than pylons proposed for the remainder of the preferred alignment in order to facilitate the crossing of the River Ouse and ensure sufficient safety clearance is achieved to the navigable river.

Route section 5
River Ouse crossing - Luddington

From the start of Route section 5 at Narrow Lane, the preferred alignment is routed broadly southeast to the west of the settlement of Garthorpe and east of the settlement of Luddington crossing Adlingfleet Drain, Pasture Lane and Carr Lane to the end of this Route Section at Meredyke Road.



Route section 6
Luddington - M180 motorway

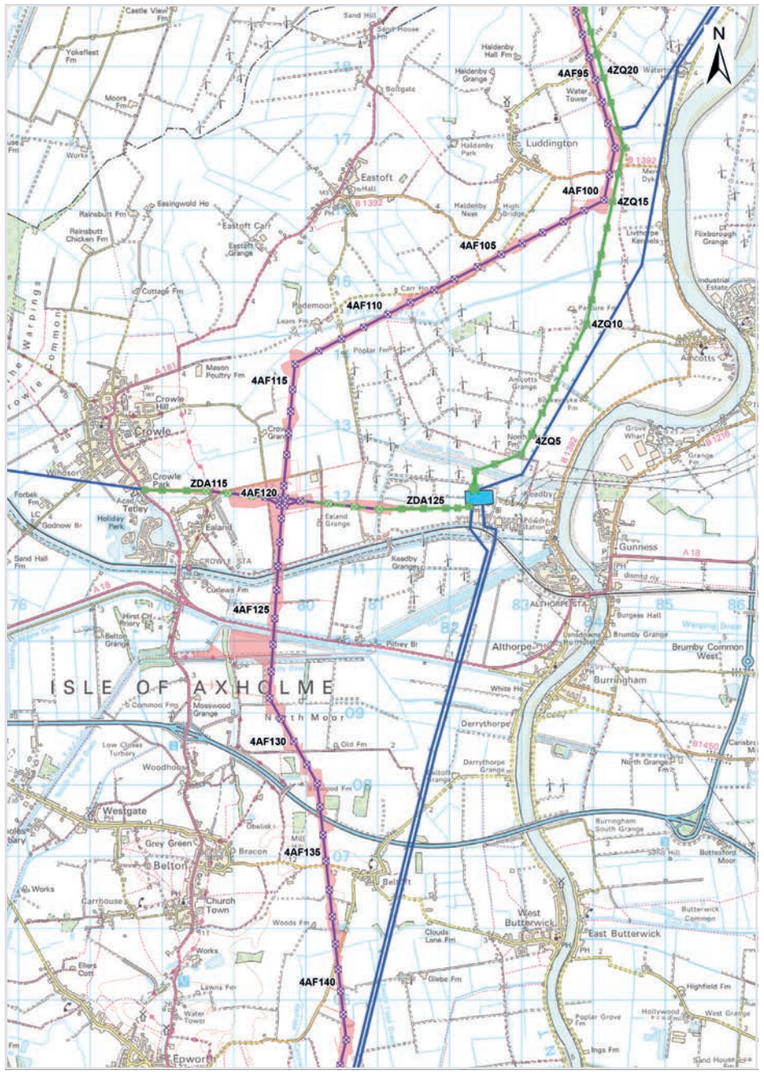
From the start of Route section 6 at Meredyke Road the preferred alignment is routed southwest to the south of the settlements of Luddington and Eastoft for approximately 4.8 km, crossing Pasture Lane and Carr Lane to proposed pylon 4AF114. From proposed pylon 4AF114 the preferred alignment is routed broadly south to the east of Crowle for a further 6.4 km crossing Outgate, the existing ZDA 400 kV overhead line, the Sheffield and South Yorkshire Navigation and the A18 to the end of the section at the M180.

In this Route Section the preferred alignment moves away from being parallel with the existing 4ZQ overhead line at proposed pylon 4AF100.

The preferred alignment crosses the existing ZDA 400 kV overhead line between Keadby and Crowle.

Key:

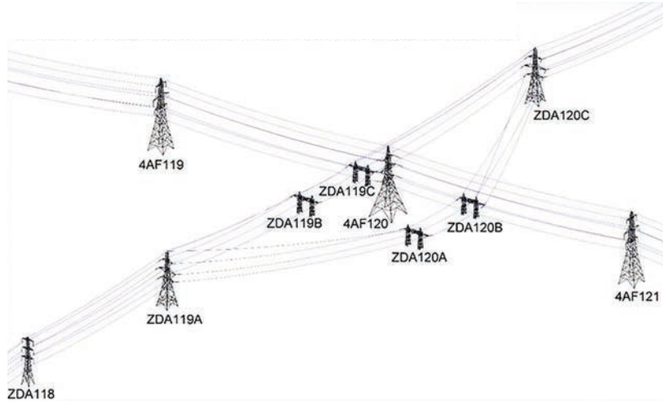
- Draft order limits
- Indicative new lattice pylon
- Existing lattice pylon - not affected
- Existing lattice pylon - to be modified
- Indicative new overhead line
- Existing overhead line not affected
- Existing overhead line to be reconductored
- 400 kV existing overhead line
- Existing 400 kV substation



Changes in Section 6 since our non-statutory consultation During our non-statutory consultation we explained the need for North Humber to High Marnham to cross the existing ZDA 400 kV overhead line. We explained it may be necessary to underground a section of the existing ZDA route to facilitate the crossing.

Following further assessment of different options for crossing the existing ZDA route, we are proposing a diamond duck under crossing. This involves the existing ZDA route ducking under a section of the preferred alignment, with the circuit being split across four single flat formation towers (SFTs) in a diamond shaped arrangement. This will allow for potential future operation of the existing single circuit ZDA route as a double circuit.
To facilitate this crossing, the existing ZDA overhead line would be split into two sections of lowered overhead line between proposed pylons ZDA119A and ZDA120C. This is to ensure the required electrical clearance between the proposed and existing line.

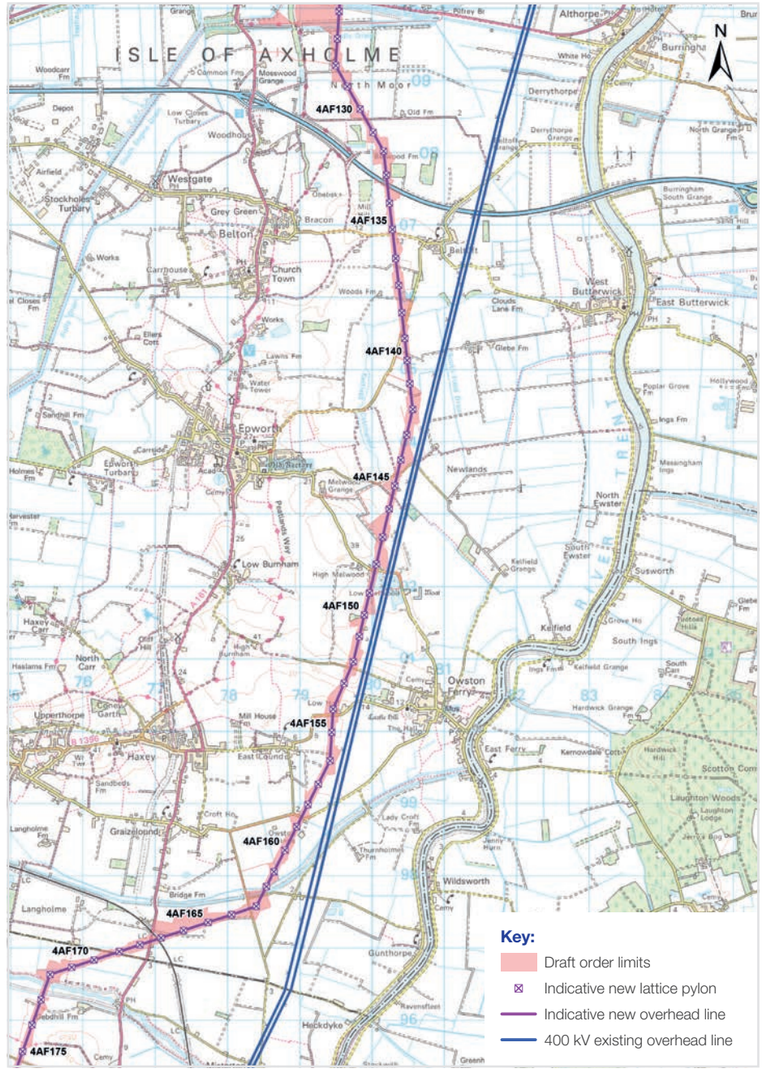
Illustrative design of diamond duck under crossing arrangement



In this Route section we are proposing a diamond duck under crossing, which is where the existing ZDA overhead line will be modified by replacing two existing pylons with two new pylons and two sets of lower height structures. Each new pylon/ structure pair will carry an individual electrical circuit so that the proposed new overhead line can maintain sufficient electrical safety clearance to the existing ZDA overhead line.
You can see an illustration of how the diamond duck under crossing could look on this page.

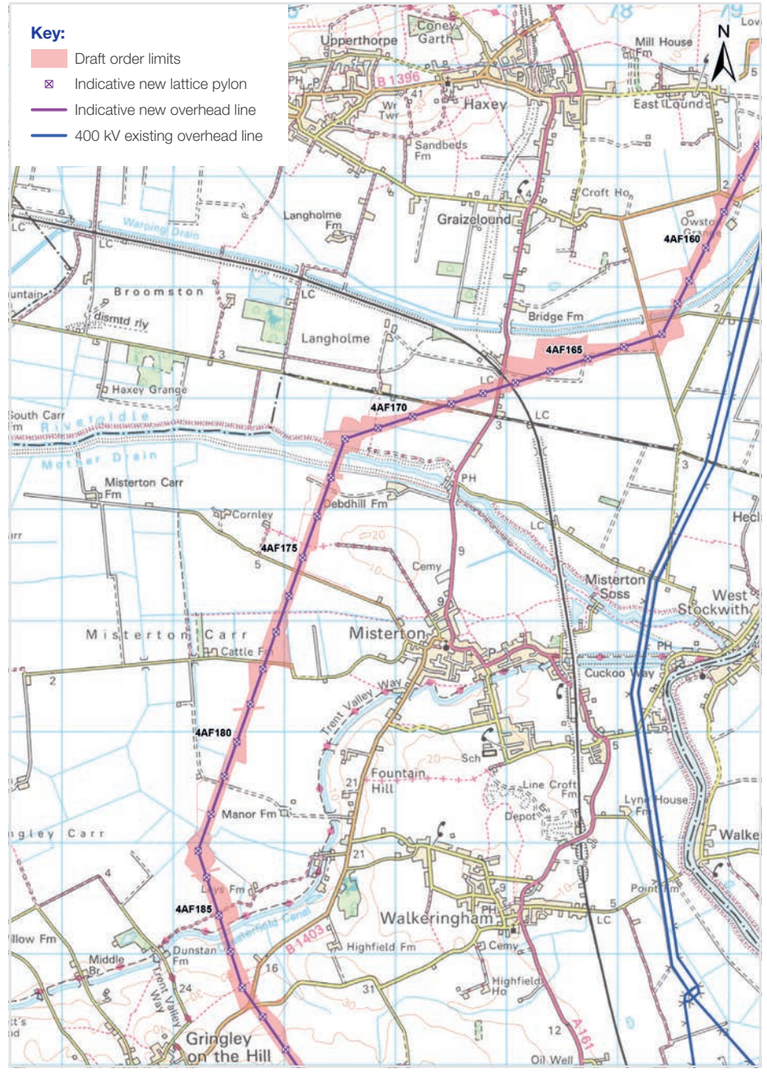
Route section 7
M180 motorway - Graizelound

From the start of the Route section at the M180 the preferred alignment is generally routed south, to the west of the settlements of Beltoft and Owston Ferry and east of the settlements of Belton, Epworth, East Lound and Graiselound. The preferred alignment crosses Belton Road, Gurry Lane, Epworth Road, Newlands Lane, Melwood Hill, Burnham Road, East Lound Road, Ferry Road and Gunthorpe Road to the end of the section at Stockwith Road. In this Route section the preferred alignment is routed in parallel or close parallel with the existing 400 kV overhead lines for approximately 5 km between proposed pylons 4AF142 and 4AF156.



Route section 8
Graizelound - Chesterfield Canal

From the start of the Route section at Stockwith Road the preferred alignment is routed generally west for approximately 3 km crossing a railway line and Tindle Bank Road to proposed pylon 4AF172. From proposed pylon 4AF172 the preferred alignment is then routed generally south for approximately 4.6 km to the west of the settlement of Misterton to the Chesterfield Canal, crossing the River Idle, Cornley Road and Cattle Road.

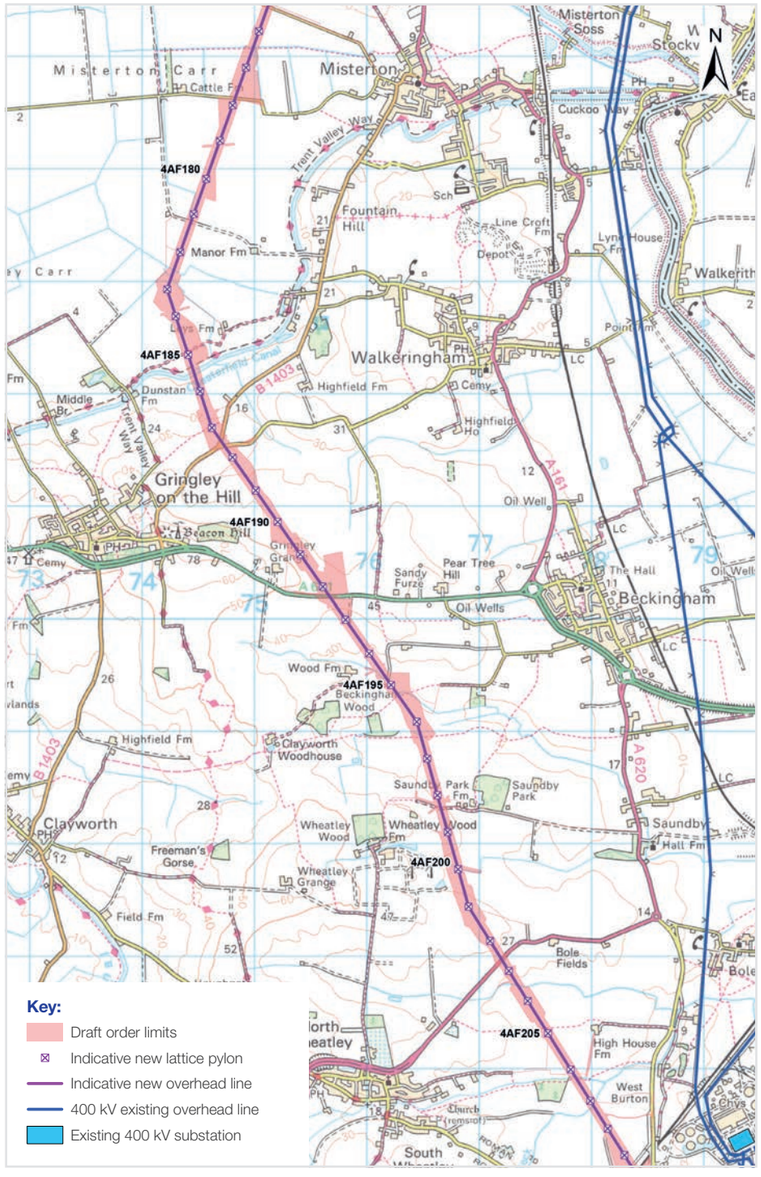


Route section 9
Chesterfield Canal - A620

From the start of Route section 9 at the Chesterfield Canal the preferred alignment is routed in a general southeasterly direction for approximately 6 km to the east of the settlements of Walkeringham and Beckingham and east of the settlement of Gringley on the Hill to the end of the Route Section at the A620. The preferred alignment crosses the B1403, Walkeringham Road, A63 and Wood Lane.

Changes in Route sections 8 and 9 following the non-statutory consultation

The preferred alignment would extend outside of the graduated swathe and across the Carrs area to the north of Gringley. This change has been made to reduce landscape and visual impacts, including to residential amenity, views and local tourism businesses.



Route section 10
A620 - Fledborough

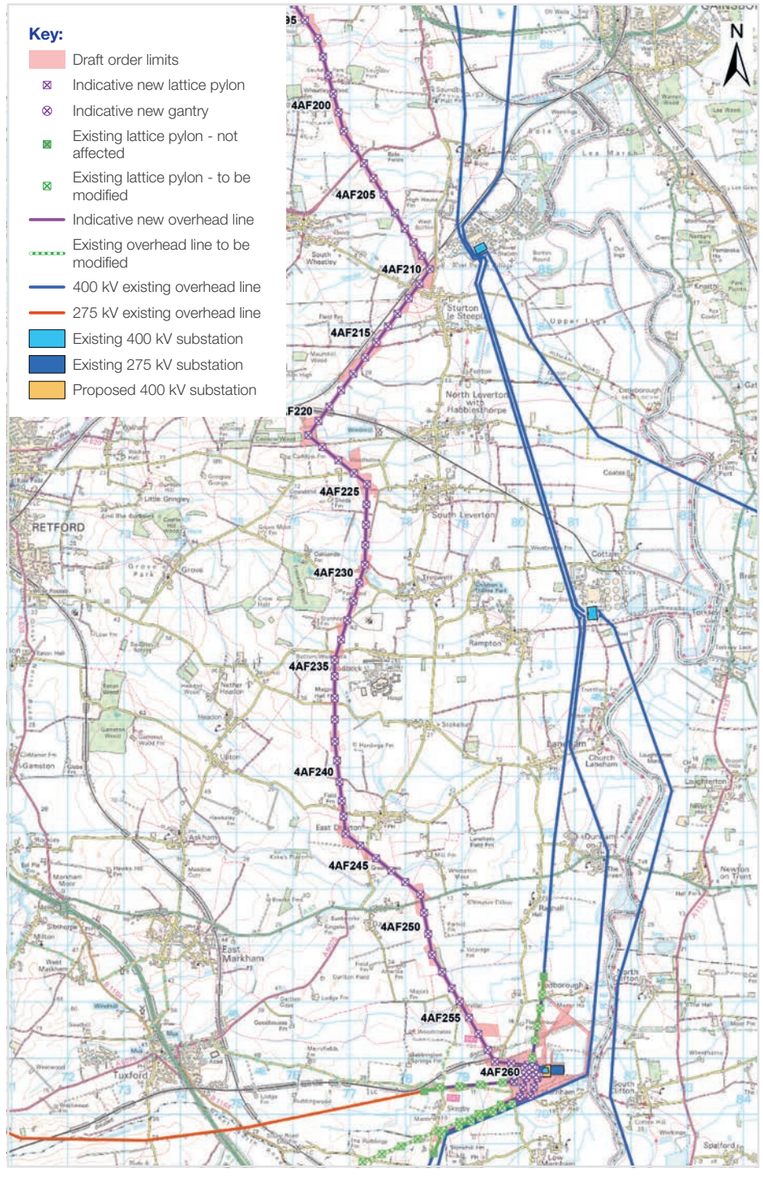
From the start of Route section 10 at A620 Gainsborough Road the preferred alignment is routed southeast to the east of North and South Wheatley for approximately 2.3 km to proposed pylon 4AF209 to the north of Sturton le Steeple.

Changes in Route section 10 following the non-statutory and localised non-statutory consultations

Following the localised non-statutory consultation in 2024 the 'eastern corridor' was discounted and the emerging preferred corridor as presented in 2023 was taken forward for development of the preferred alignment.

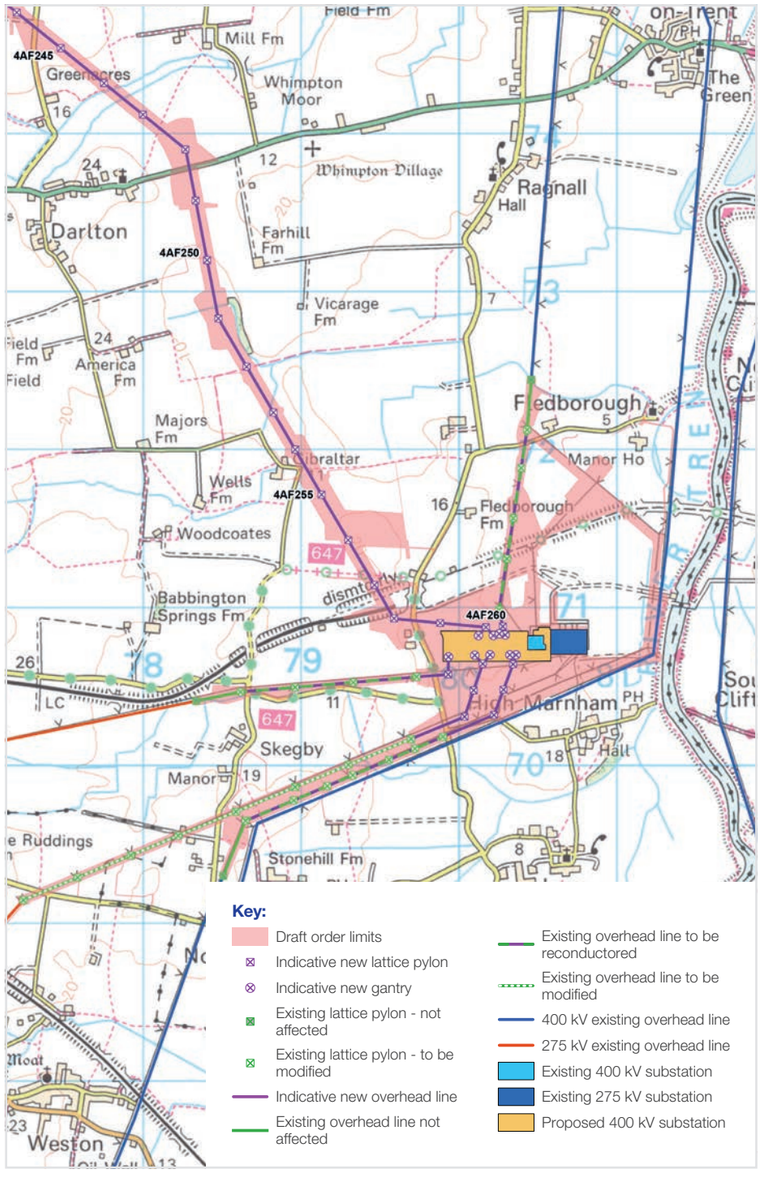
The preferred alignment would route to the east, outside the emerging preferred corridor (presented at our non-statutory consultation) to the north of Sturton-le-Steeple, and broadly equidistant between Wheatley and Bole.

This change has been made to avoid interactions with the existing 132 kV overhead line and Wood Lane solar farm which would be unavoidable if the alignment had been within the emerging preferred corridor.



Route section 11
Fledborough - High Marnham

Continuing from the boundary with Route section 10 the preferred alignment is routed southeast for approximately 0.5 km, crossing the disused railway west of the Marnham Railway Yard Local Wildlife Site and Fledborough to Harby Dismantled Railway Local Wildlife Site to proposed pylon 4AF258. From proposed pylon 4AF258 the preferred alignment is routed east for approximately 0.5 km to the proposed High Marnham substation.



Substation
High Marnham

National Grid is currently developing proposals for a new substation at High Marnham. The new High Marnham substation will connect a number of new customers, playing an important role in building a more secure and resilient future energy system. More information on the consenting approach for the substations is available on page 24.

The proposed High Marnham substation is located to the west of the former High Marnham Power Station, approximately 0.1 km east of Main Street and approximately 1.4 km north of Hollowgate Lane. A new permanent access is proposed from the current access road off Main Street, this would also serve as one of the proposed temporary construction accesses. Three construction compounds / laydown areas are proposed. As part of the substation works there is also a requirement to reconfigure the existing overhead lines that currently connect into the existing 275 kV and 400 kV substations so they can connect into the proposed new 400 kV substation.

Construction

Should consent be granted for North Humber to High Marnham, we would expect construction to start in 2028, with the project becoming fully operational in 2031.

Our proposals include works associated with preparing the land for construction activity, such as vegetation clearance, diversions of third-party assets (such as utilities and services) and drainage works needed to ensure that land is not impacted by flooding or other damage throughout the construction and operation of North Humber to High Marnham.

The construction phase would involve a range of temporary construction activities, including working areas for construction equipment and machinery, site offices, storage, accesses, bellmouths, and haul roads, as well as creating crossing points across local watercourses and the diversion of public rights of way.

Building overhead lines and pylons

The first step in building overhead lines and pylons is enabling works, which include installation of bellmouth accesses, haul roads and construction compounds, along with any necessary changes to the public highway network in order to facilitate construction vehicles. Our construction areas are also fenced off to keep the public and livestock out of harm's way; and certain third-party assets, such as distribution network overhead pole lines, may need to be diverted, protected or routed underground to facilitate construction of the new 400 kV overhead line.

Following these enabling works, pylon working areas can be installed. To form the foundations for each pylon, long concrete pillars are driven deep into the ground and topped with a layer of reinforced concrete. Machinery, pre-mixed concrete and steelwork for the foundations will be delivered to the construction site in heavy goods vehicles (HGVs).

Pylons are made up of many beams and struts. They are assembled in sections at ground level before being lifted into place by a crane. The number of sections for each pylon would vary according to the size and type of pylon being built. This, along with the spacing between each pylon, is determined by safety, topographical, operational and environmental considerations.

Once pylons have been built, we hang the wires (also known as conductors) that carry the electricity – this is known as 'stringing'. We would string a section of approximately 10 pylons at a time. The wires would be pulled from one end to the other using large machinery. Where the pylon route crosses areas such as roads, rivers and publicly accessible areas, we would erect scaffolding and netting to keep everyone safe whilst we are carrying out this work. We may also use temporary traffic lights or 'Stop and Go' boards on some roads.

Once the overhead lines have been attached, temporary roads and working areas will be removed and the ground reinstated.

How we construct a substation

First, we clear and level the area, then we excavate the earth to make way for the foundations - sometimes this earth is used to relandscape the surrounding terrain. All building structures are built on site and will be designed and built to suit the requirements of the substation, depending on the technology we need to use - that could be air insulated switchgear (AIS) or gas insulated switchgear (GIS). We finish the construction by cladding the buildings in accordance with agreements made during the planning process, and this depends on characteristics of the surrounding area. Trees, hedges, and shrubs may be planted on the relandscaped area surrounding the site to help screen the substation from view. An electrical connection is installed between the substation and the National Grid network – this could be a cable or an overhead line.

Temporary construction compounds

We need to set up temporary construction compounds to support construction activities. Construction compounds are temporary areas that we use to house temporary offices, staff welfare facilities and to store equipment. They have a hard-standing surface, are secured by perimeter fencing and will be removed at the end of the project. For more information on construction compounds, see the Preliminary environmental information report (PEIR).

Primary access routes and haul roads are public roads which have been identified to route construction vehicles and HGVs.

Managing and mitigating effects

Feedback from all stages of consultation, along with outputs from our ongoing technical and environmental assessments, will help us further refine our proposals for North Humber to High Marnham as we prepare our DCO application.

We use best practice environmental impact assessment techniques to assess possible effects of our work and identify opportunities for mitigation measures and for delivering biodiversity net gain.

Our Preliminary environmental information report (PEIR) considers the likely significant effects of our proposals on the environment, along with the measures we are proposing to avoid, reduce or mitigate these impacts. The PEIR, along with non-technical summary of its findings, is available on our project website at **nationalgrid.com/nh-hm**.

Protecting the environment during construction

Our detailed environmental surveys and assessments have helped us to understand potential effects and how they can be avoided, reduced or mitigated during construction and operation. Where avoidance and mitigation is not possible, we would offset – or compensate for – effects by planting or enhancing the environment near to the area of works. We are working closely with local authorities and relevant stakeholders to identify what kind of enhancement is most suitable and where to locate it.

Environmental impact

We are required to follow a set procedure for all nationally significant infrastructure projects to assess the likely significant environmental effects of our proposals. We will carry out an environmental impact assessment (EIA) and submit a full environmental statement (ES) and non-technical summary as part of our application for development consent.

Biodiversity net gain

Biodiversity net gain (BNG) is a way to ensure that the environment is left in a better state after construction than it was before the work started. The decline of biodiversity in the UK is well documented and we are conscious that our activities can impact habitats and therefore species' ability to thrive. We have committed to achieving a minimum of 10% biodiversity net gain for new major projects to ensure we leave the site and local area in a measurably better state than before the development took place. BNG can be achieved through habitat creation and/or enhancement and may be delivered on site or off site.

Protecting soil and agricultural land

We appreciate the national significance of the agricultural land impacted by our proposals, and would put measures in place to reduce our impact, including:

- the careful removal of soil to be stored adjacent to the working area, meaning soil of the same texture, organic matter content and nutrient status can be reinstated in the same area it was removed from and to match the existing soil profile as far as it is possible
- implementing a soil management plan to ensure there is no drop in soil quality as a result of construction works. As part of the plan, soil will be tested before and after construction
- protection of livestock by erecting suitable fencing
- soil handling works will be supervised by appropriately qualified and experienced individuals, and an appropriate aftercare period and plan will be set out. Through the implementation of these mitigation measures the project aims to reinstate land to its original condition and land grade.

Information for landowners

When developing our proposals, we need to understand who has a legal interest in the land in and around the areas being considered as part of the project.

In the DCO process, anyone with a legal interest in land is known as a person with an interest in land (PIL). If you are identified as a PIL, we will contact you directly.

Whilst much of the information we need is available on public registers, we have appointed land referencing firm Dalcour Maclaren to contact individual landowners to verify the publicly available information and ensure we have made best efforts to identify any potentially impacted landowners.

If you are a landowner and believe your property may be affected by our proposals, and want to talk to our lands team, please email **NH-HM@dalcourmaclaren.com**, call **0333 188 3511** or write to **Unit 1, Staplehurst Farm, Weston on the Green, OX25 3QU**.

Surveys

As we work to develop our proposals, we have undertaken surveys in areas close to the route. This includes ecology and habitat surveys, as well as ground investigation studies, which include borehole drilling, trial pit digging and monitoring activities. Some of these surveys will continue as we work to finalise our application for development consent for the Project and assess conditions for construction. We encourage landowners to contact us if they have any queries about how their land may be affected.

Since the consultations in 2023 and 2024, our land referencing company WSP has been making enquiries to identify and confirm all relevant land interests. WSP has issued a Landowner Interest Questionnaire (LIQ) to people with an interest in land, to ensure the correct information is held relating to each parcel of land.

More detailed information for landowners, along with relevant contact information can be found on the landowner page of our project website.

Next steps

All feedback we receive as part of this consultation will be carefully considered, alongside the outcome of our ongoing technical and environmental assessments as we finalise our proposals and prepare our application for development consent.

During this time, we will also:

- continue our discussions with landowners and people with a legal interest in land
- continue briefing local elected representatives
- continue working with local authorities and other stakeholders
- provide updates to those who have asked to be kept updated on our proposals via email. You can register for these updates on our website at **nationalgrid.com/nh-hm**
- post updates on the North Humber to High Marnham project website at **nationalgrid.com/nh-hm**
- continue to refine our proposals in response to feedback and findings from technical studies and surveys
- prepare our application for development consent.

Once we have prepared our application for development consent, we will submit our application to the Planning Inspectorate seeking permission to build North Humber to High Marnham.

Our submission will include a Consultation report, showing how we have taken account of feedback received to all stages of consultation.

The Planning Inspectorate will examine our proposals and make a recommendation on the application to the Secretary of State for the Department of Energy Security and Net Zero, who will make the final decision on whether to grant consent.

If consented, we expect construction work to start in 2028 with North Humber to High Marnham operational in 2031.

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