Issue No: BT-NG-020620-560-0001

Bramford to Twinstead Reinforcement

1.1 Project Background Document

January 2022

nationalgrid

Introduction

National Grid is proposing to upgrade the electricity transmission network in East Anglia. This Project Background Document explains our proposals to add much needed capability to the network between Bramford substation in Suffolk and Twinstead Tee in Essex.

It has been prepared to support the formal (statutory) stage of consultation in Spring 2022. This consultation follows on from earlier stages of non-statutory consultation and subsequent development of the proposals.

These consultations form part of the pre-application process through which proposals are developed, prior to the submission of a formal application for permission to build, operate and maintain the reinforcement. We have set out how we plan to consult in our Statement of Community Consultation. It is important that we get as much feedback as possible during this consultation, as this may be our last consultation before we submit our application for development consent.

Contents

Executive summary

This Project Background Document explains our proposals to add much needed capability to the electricity transmission network between Bramford substation in Suffolk and Twinstead Tee in Essex. This document has been designed to assist stakeholders in responding to our statutory consultation, which runs from 25 January until 21 March 2022.

The energy we all use is increasingly coming from renewable and low carbon sources and the UK has set a clear ambition to be a global leader in clean energy. The Government is committed to reaching net zero greenhouse gas emissions by 2050 and has set out its ambition to connect 40 GW of offshore wind by 2030 – enough to power every home in the country by the end of this decade.

To help the move towards cleaner, greener energy, a large number of offshore wind projects are being developed by different companies around the UK coastline, 60 per cent of which are looking to come ashore up and down the East Coast.

In addition to new energy generated by offshore wind, new nuclear generation is planned at Sizewell C. We are also transporting more power with countries across the North Sea using interconnectors. New generation from wind, nuclear and interconnection means the amount of renewable and low carbon electricity sources expected to connect in East Anglia is set to significantly increase.

The existing electricity transmission network in East Anglia was developed in the 1960s to make sure the area has the electricity it needs. Until today it has been able to meet that demand, as well as transporting around 3.5 GW of power from nuclear generators and the early offshore wind projects out of the region. However, the capacity of the network will soon be exceeded.

By 2030, the amount of renewable and low carbon energy connecting to the network will dramatically increase – between 16-25 GW is expected to connect in East Anglia by the end of this decade. The existing network in East Anglia does not have the capability to reliably and securely transport all the energy that will be connected by 2030 while operating to the standards it is required to.

Feeding into Bramford substation from the north and east, there are currently three electricity transmission lines carrying power from Sizewell B nuclear power station and a number of offshore wind farms. West of Bramford out to Twinstead Tee, there is currently only one electricity transmission line taking that power out to the wider network, which creates a bottleneck.

This bottleneck significantly constrains the amount of power that can be carried westward on the network from Bramford when new sources of energy are connected. While additional network reinforcement will be needed elsewhere in East Anglia to carry the green energy that is coming in the next decade on to homes and businesses, it is essential we address this constraint on the network between Bramford and Twinstead Tee and provide the vital capacity needed.

Other reinforcements will not take away the need to add capacity to this part of the network, as the need to reinforce the network between Bramford and Twinstead is critical in all Future Energy Scenarios.

Between 2009 and 2013 work was undertaken to develop proposals to add this much needed network capability. Changes to when the planned new generation would come online in East Anglia meant that work was put on hold at the end of 2013.

Now that multiple offshore wind developments have moved forward, backed by Government targets and legislation, it is clear this reinforcement is needed. In 2020, work on the project therefore resumed and we will be taking forward the work required to ensure it is in place before the end of the decade. This is so that we can use cleaner, greener electricity in our homes and businesses.

Last year, we held a non-statutory consultation to re-introduce the project, explain how we had reviewed the proposals and why additional capability is needed on this part of the network, and hear your views.

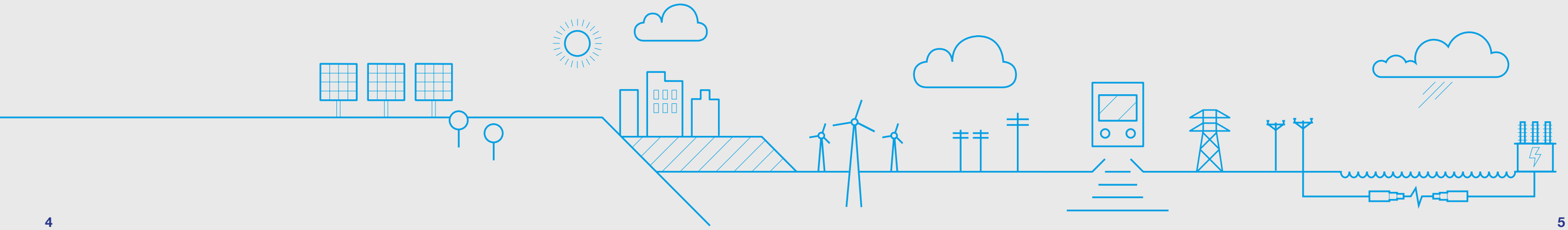
Since the end of that consultation, we have considered all feedback received, undertaken further technical studies, and continued to develop our proposals.

This statutory public consultation will give you the opportunity to see how our proposals for the Bramford to Twinstead reinforcement have developed, read more detailed information on various aspects of the proposals, see how we have considered feedback from our last round of consultation, and hear your views on our current plans.

We will consider all feedback received through this consultation as we look to finalise our proposals prior to submitting an application for Development Consent to the Planning Inspectorate. A Development Consent Order is needed for the Bramford to Twinstead reinforcement project because it is considered a 'Nationally Significant Infrastructure Project'. We aim to submit a Development Consent Order Application in winter 2022/23.

It is important that we hear the views of local people. Knowing what matters to you matters to us, so that we can take it into account where we can as we finalise our plans.

Please therefore take time to digest the information within this document and give us your feedback on the plans, as we seek to deliver a cleaner, greener future.

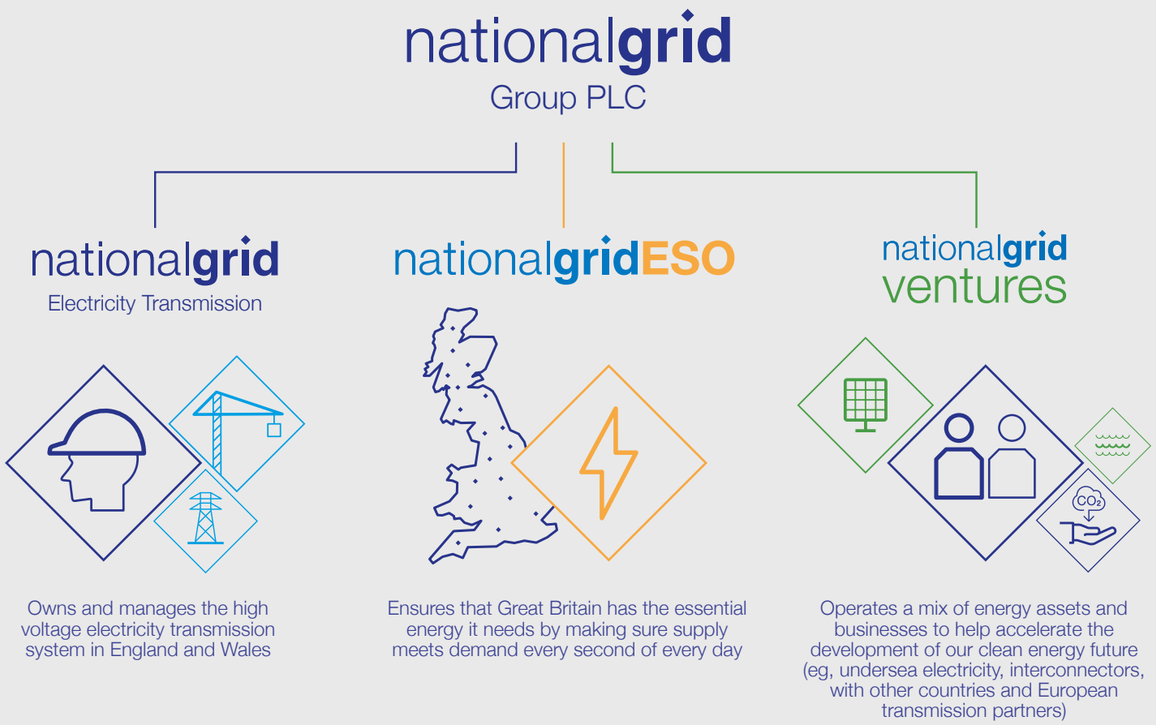


National Grid Electricity Transmission – Who we are

National Grid Electricity Transmission owns, builds and maintains the network in England and Wales. It is National Grid Electricity Transmission that is developing plans for the Bramford to Twinstead reinforcement.

National Grid sits at the heart of Britain's energy system, connecting millions of people and businesses to the energy they use every day. We bring energy to life – in the heat, light and power we bring to our customer's homes and businesses; in the way that we support our communities and help them to grow; and in the way we show up in the world. It is our vision to be at the heart of a clean, fair and affordable energy future.

Within the National Grid Group there are distinctly separate legal entities, each with their individual responsibilities and roles. These are shown in the following diagram.



Each of the different entities within the National Grid Group are working to build a cleaner, fairer and more affordable energy system that serves everyone – powering the future of our homes, transport and industry.

Under the Electricity Act 1989, National Grid ESO and National Grid Electricity Transmission must develop transmission network proposals in an efficient, coordinated, and economical way, and in a way which considers people and places. Options to deliver additional network capability and the options we take forward are evaluated against these statutory duties.

How we will go about doing that, meeting our amenity responsibilities and involving stakeholders and communities is outlined in our **commitments when undertaking works in the UK**[1]:

1. **Establishing need**
   We only seek to build electricity lines along new routes or build new above-ground installations where existing infrastructure cannot be upgraded, where forecasted increases in demand cannot be met by other means, where customer connections are required, or where existing infrastructure has been identified for replacement.

2. **Involving stakeholders and communities**
   We promote genuine and meaningful engagement, meeting and, where appropriate, exceeding the requirements for consultation or engagement.

3. **Routeing networks and selecting sites**
   If we need to build new infrastructure we seek to avoid areas which are nationally or internationally designated for their landscape, wildlife or cultural significance.

4. **Minimising the effects of new infrastructure**
   When we are developing new infrastructure, we seek to reduce the effect of our work on communities by having regard to safety, noise and construction traffic.

5. **Mitigating adverse effects of works**
   We carry out relevant environmental investigations and report on these when we apply for consent for new works. Additionally, we use best practice environmental impact assessment techniques to assess possible effects of our works and identify opportunities for mitigation measures.

6. **Offsetting where mitigation is not practicable**
   When we cannot mitigate the impacts of our proposals, we offset these impacts in practical and sustainable ways that are developed through engagement with local stakeholders.

7. **Enhancing the environment around our works**
   When undertaking works, we consider what practicable measures can be taken to enhance nearby and surrounding areas for the benefit of local communities and the natural and historic environment.

8. **Monitoring and learning for the future**
   We monitor, evaluate and review our engagement processes to learn from previous experiences to improve our working practices.

9. **Reviewing our commitments**
   We review these commitments at least every five years, and make additional revisions in response to new legislation, policy and guidance.

10. **Working with others**
    We require other organisations working on our behalf to demonstrate these same commitments and continue to create an environment where we can share and deliver best practice.

[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/uk/electricity-transmission/document/81026/download

Many other organisations also have a key role to play in delivering a cleaner energy future.

Department for Business, Energy & Industrial Strategy

BEIS (The Department for Business, Energy & Industrial Strategy), is the ministerial department with primary responsibility for energy.

In November 2020, the Prime Minister set out a Ten Point Plan for a Green Industrial Revolution[2]. This was followed by a White Paper, which sets out the Government's proposals for future law. The Energy White Paper, entitled Powering our Net Zero Future[3], sets out how, as a country, we will transform the way we produce and use energy to tackle climate change, meet net zero emissions by 2050 and build back greener.

The White Paper focuses on the Government's ambitions to increase energy generation from offshore wind and interconnectors, as well as hydrogen, carbon capture utilisation and storage (CCUS), heat and transport decarbonisation.

BEIS, working with input from National Grid ESO, is also conducting a review of how offshore wind is connected, with the aim of removing barriers to achieving Government ambitions for offshore wind[4].

The Secretary of State for BEIS is also the ultimate decision maker for new electricity transmission network proposals under **The Planning Act 2008 (as amended)**.[5]

Planning Inspectorate

The Planning Inspectorate is the Government agency responsible for examining proposals for Nationally Significant Infrastructure Projects. In energy terms, those include offshore wind farms, new nuclear power stations and new overhead lines greater than 2 km in length.

The Bramford to Twinstead reinforcement is a Nationally Significant Infrastructure Project.

ofgem

Ofgem (the Office of Gas and Electricity Markets) is the government regulator for gas and electricity markets in Great Britain. Ofgem is a non-ministerial government department and an independent National Regulatory Authority, whose role is to protect consumers as a greener, fairer, energy system is delivered.

Ofgem works with Government, industry and consumer groups to help deliver a net zero from an energy perspective at the lowest cost possible to consumers.

nationalgridESO

National Grid ESO is the Electricity System Operator for the whole of Great Britain. National Grid ESO ensures electricity is always where it is needed and the network remains stable and secure in its operation. Generators apply to National Grid ESO when they wish to connect to the network and National Grid ESO leads the work to consider how the network may need to evolve to deliver a cleaner greener future.

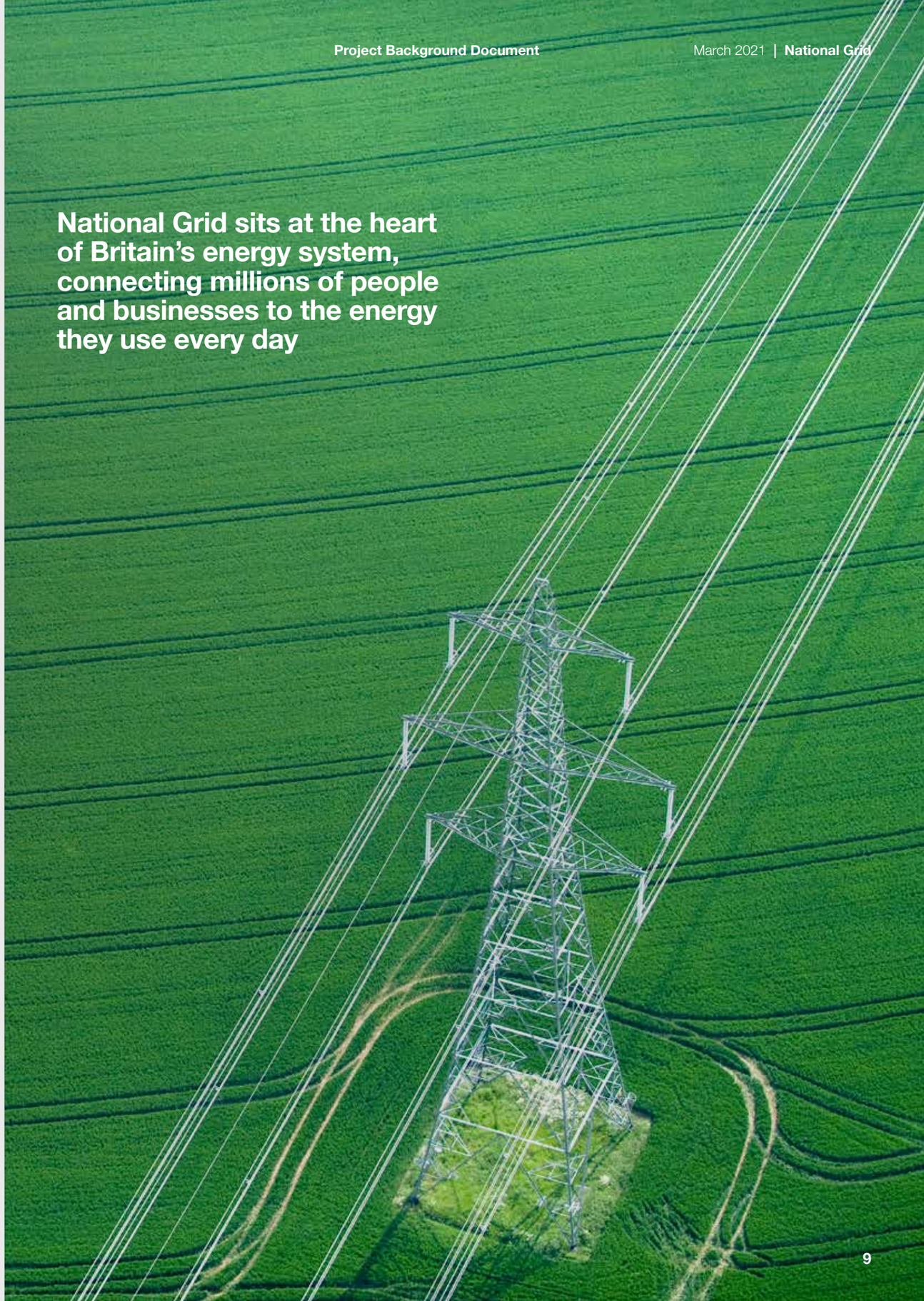
[2] The ten point plan for a green industrial revolution (UK Government, November 2020) – Available at https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution

[3] Energy white paper: Powering our net zero future (Department for Business, Energy and Industrial Strategy, December 2020) – Available at https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future

[4] BEIS Offshore Transmission Network Review

[5] Planning Act 2008 (UK Government, December 2020) – Available at https://www.legislation.gov.uk/ukpga/2008/29/contents

National Grid sits at the heart of Britain's energy system, connecting millions of people and businesses to the energy they use every day



Moving towards net zero

The world we live in is changing, and the UK is at a turning point as we embrace the enormous opportunities a cleaner, greener future brings. Government has made it clear that a key part of recovery from the coronavirus pandemic is building back cleaner and greener.

The UK has set a world-leading target to tackle climate change, which is to achieve net zero by 2050. Put simply, this means that we will remove the same amount of greenhouse gases from the atmosphere as we produce.

As a country we are already making progress. The UK has the largest offshore wind capacity in the world, with some 8.5 GW operating and a further 1.9 GW under construction. 2020 was the greenest year on record for Britain's electricity system. Spring 2020 saw the longest run since the industrial revolution without burning coal, stretching almost 68 days.

2020 was also a record-breaking year for renewables. Wind generation records were broken several times during the year, peaking at 59.9 per cent of the electricity mix on August 26. Solar power too set new records with 9.7 GW of power being produced, and its highest share of the electricity mix reaching 34 per cent on several occasions in May.

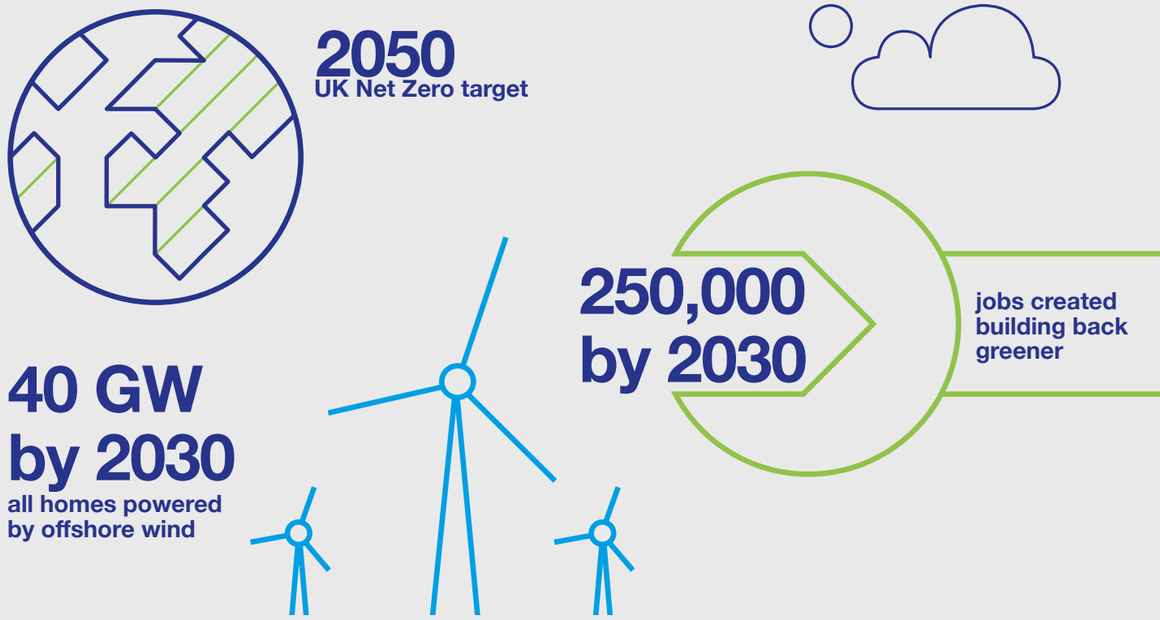
In April 2021, Great Britain's electricity transmission network set a record for being the greenest it has ever been and in May 2021, wind power generated more than it ever has with 17.7 GW contributing to meeting our energy needs.

But more needs to be done. A healthier, greener future for Britain requires significant upgrades to our energy infrastructure to deliver clean green energy from where it is produced to where it is needed. Decarbonising the energy system means replacing – as far as it is possible to do so – fossil fuels with clean energy technologies such as from wind turbines and nuclear power for electricity production.

Growth in energy generated from offshore wind is a key part of achieving net zero and the Government's **Energy White Paper** sets an ambitious target to deliver 40 GW of offshore wind connected to the network by 2030 – enough to power every home in the UK. Growth in offshore wind also offers significant opportunities for economic growth and job creation. There are up to 60,000 jobs expected to be created in the offshore wind sector alone in this decade. Up to 250,000 jobs are also expected to be created by 2030 across the proposals in the Prime Minister's **Ten Point Plan for a Green Industrial Revolution**.

The **Climate Change Committee** anticipate that electricity demand will at least double by 2050 as we shift to clean energy to drive electric vehicles, heat our homes and power our industry[6]. The Committee's **Sixth Carbon Budget**[7] published in December 2020 recommends deployment of renewables at scale, including 40 GW of offshore wind by 2030 and sustaining that build rate to support deployment up to 140 GW of offshore wind by 2050, raising further opportunity for growth and job creation. By 2050, our own analysis indicates that the energy sector needs to fill around 400,000 jobs to **build the Net zero energy workforce**[8].

Our mission at National Grid is to support these aims. We believe by acting now, the UK can become the world's first major clean economy, with net zero carbon emissions by 2050, creating growth and jobs for communities across Britain.



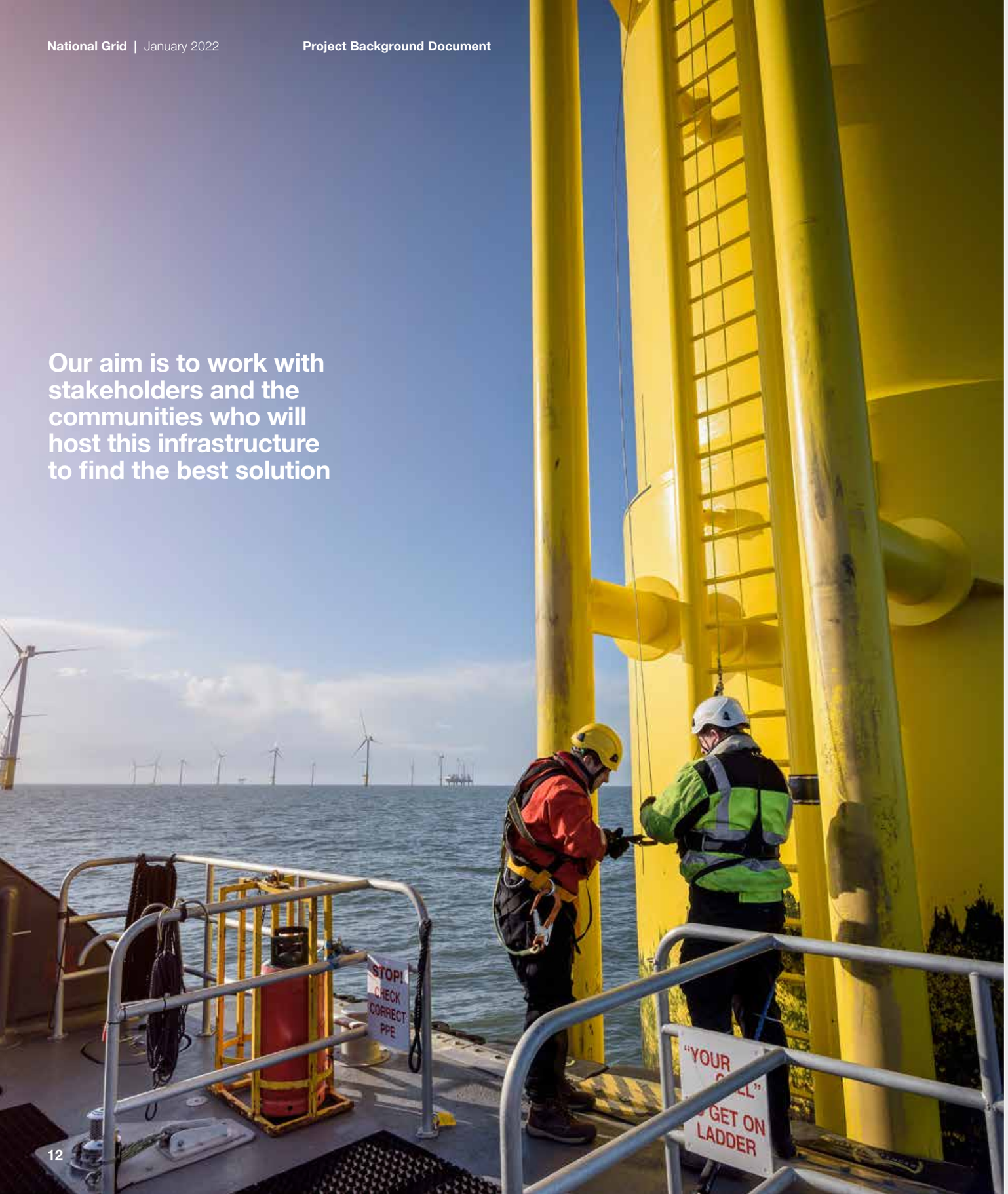
[6] Net Zero – The UK's contribution to stopping global warming (Committee on Climate Change, May 2019) – Available at https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/

[7] The Sixth Carbon Budget: The UK's path to Net Zero (Committee on Climate Change, December 2020) – Available at https://www.theccc.org.uk/publication/sixth-carbon-budget/

[8] Building the Net Zero Energy Workforce (National Grid, January 2020) – Available at https://www.nationalgrid.com/document/126256/download

[9] East Coast Infrastructure Project (National Grid, April 2021) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/moving-towards-net-zero

Our aim is to work with stakeholders and the communities who will host this infrastructure to find the best solution



Delivering a cleaner, greener future

To meet the 2030 target and 2050 legislation and move to a low carbon future using energy from offshore wind, nuclear power and interconnectors, we need to transport that energy from where it is produced or comes ashore, to where it is needed.

The electricity transmission network, which moves energy at scale around the country, will play a vital role in this.

The existing network was designed to connect and transport energy from coal, nuclear and gas-fired power stations. In many parts of the country those power stations were more closely located to the larger centres of population, with power flowing mostly north to south around the country.

With around 60 per cent of all offshore wind developments looking to bring their energy onshore up and down the East Coast, we need to rewire the network for a different low carbon future; one where we deliver offshore energy from the East Coast to the entire UK population.

To achieve this it will be critical to strike the right balance between the need to connect the growing amount of offshore wind power, the cost to UK consumers and the impact to local communities and the environment. Our aim is to work with stakeholders and the communities who will host this infrastructure to find the best solution, balancing the needs of the UK, the environment and the regions we directly work in.

How the need for network reinforcement is identified

National Grid ESO leads an annual cycle which looks at how much energy needs to be carried on the network in the future, and where network capability needs to be improved to accommodate that.

The overall effect of that process is to ensure that the right efficient, coordinated and economical proposals are brought forward to deliver what the country requires from the electricity transmission system in a way that represents best value to electricity consumers.

How National Grid ESO reviews how the network needs to adapt:

1. A range of **Future Energy Scenarios**[10] are discussed with stakeholders and are published each summer. Future Energy Scenarios represent different credible scenarios for how quickly we might make the transition to a cleaner greener energy future as we strive towards net zero by 2050.

2. The Future Energy Scenarios inform the analysis in the **Electricity Ten Year Statement**[11] which is published each November, setting out the System Operator's view of future transmission requirements and where the capability of the transmission network might need to be addressed over the next decade.

3. Transmission Owners respond with solutions to address the requirements identified in the Electricity Ten Year Statement. National Grid ESO assess and publish their recommendations as to which proposals should proceed in a **Network Options Assessment**[12] report each spring.

4. National Grid Electricity Transmission responds to Network Options Assessment recommendations in its **Network Development Policy**[13] which is published each summer. The Network Development Policy sets out which network proposals National Grid Electricity Transmission will take forward.

In planning and operating the network, transmission license holders – onshore and offshore – are required by their licenses to comply with the **National Electricity Transmission Security and Quality of Supply Standard**[14]. These set out criteria and methodologies for planning and operating the network in Great Britain – in essence, minimum requirements designed to ensure secure and stable electricity supplies.

The need to reinforce the network between Bramford and Twinstead has been identified as critical to take forward in both the 2020 and 2021 editions of the **Network Options Assessment** reports. The 2022 edition of the Network Options Assessment is expected to reaffirm that Bramford to Twinstead remains a critical network reinforcement. We confirmed in 2020 and again in 2021, that we will be taking forward work to deliver the reinforcement identified in our **Network Development Policy** statement.

[10] Future Energy Scenarios 2021 Report (National Grid ESO, July 2021) – Available at https://www.nationalgrideso.com/future-energy/future-energy-scenarios/fes-2021

[11] Electricity Ten Year Statement 2021 (National Grid ESO, November 2021) – Available at https://www.nationalgrideso.com/document/223046/download

[12] Network Options Assessment 2020/21 (National Grid ESO, January 2021) – Available at https://www.nationalgrideso.com/research-publications/network-options-assessment-noa

[13] Network Development Policy Decisions (National Grid, June 2021) – Available at https://www.nationalgrid.com/uk/electricity-transmission/document/137041/download

[14] Security and Quality of Supply Standard (National Grid ESO, March 2021) – Available at https://www.nationalgrideso.com/industry-information/codes/security-and-quality-supply-standards

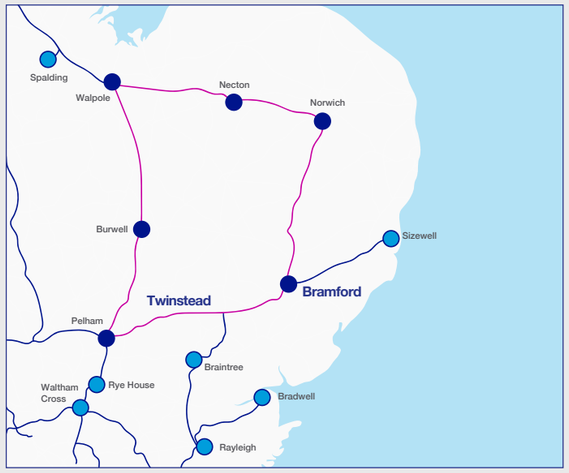
The need for reinforcement in East Anglia

At our consultation last year, we explained why there is a pressing need to reinforce the electricity transmission network in East Anglia and asked for your views on this. The Bramford to Twinstead reinforcement is considered 'critical' in all Future Energy Scenarios - a summary of the need for the reinforcement is provided in the following section.

The network today in East Anglia

Like much of the high voltage electricity transmission network across the country, the network in East Anglia was largely developed in the 1960s. It was built to supply regional demand, centred around Norwich and Ipswich, and fed from our Bramford substation.

A large loop runs from Walpole in the north to Pelham and Rayleigh/Tilbury in the south, via Norwich and Bramford. Two 400,000 volt (400 kV) overhead lines connect Sizewell B, and a decommissioned 132,000 volt (132 kV) overhead line used to connect the now decommissioned Bradwell A nuclear power station. Historically there was relatively limited generation and low consumer demand in East Anglia, when compared with other parts of the country.



Current generation and demand in East Anglia

To understand current and future demands on the electricity network the concept of network boundaries is used. A boundary splits the system into two parts 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:

1. pay electricity generators on one side of the boundary to reduce the energy they produce. This then reduces the flows of electricity across the boundary. When National Grid ESO pay generators to do this, these are called 'constraint payments'; and/or

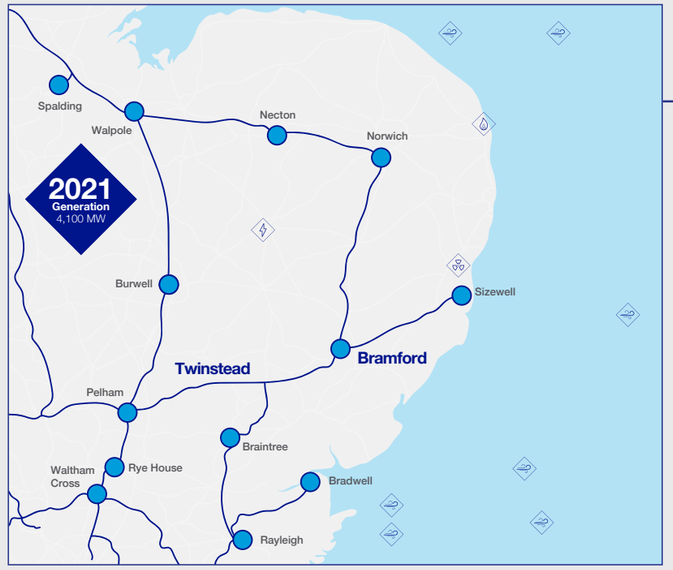
2. increase the capability of the network to allow more electricity to flow.

At present, generation in the region currently totals 4,100 MW. Most of this generation (3,160 MW) is directly connected to our network and 940 MW is connected via the UK Power Networks distribution network. We call the locally-connected generation 'embedded'. This is shown in the following table.

Peak demand for electricity in the region has been falling slightly in recent years, from a peak of 1,426 MW in 2019 to a forecast peak demand for 2021 of 1,346 MW.

Current generation in East Anglia

Project name	Generator	Connection site	Contracted generation (MW)	Type of generation
Sizewell B	EDF Energy Nuclear Generation Ltd	Sizewell	1,230	Nuclear
Dudgeon	Dudgeon Offshore Wind Ltd	Necton	400	Offshore wind
Greater Gabbard	Greater Gabbard Offshore Wind Ltd	Leiston	500	Offshore wind
Galloper	Galloper Wind Farm Ltd	Leiston	350	Offshore wind
East Anglia 1	East Anglia One Ltd	Bramford	680	Offshore wind
Sheringham Shoal	Scira Offshore Energy Ltd	Norwich (embedded)	315	Offshore wind
Gunfleet Sands	Gunfleet Sands Ltd	Bramford (embedded)	99.9	Offshore wind
Gunfleet Sands II	Gunfleet Sands II Ltd	Bramford (embedded)	64	Offshore wind
Great Yarmouth	RWE Generation UK plc	Norwich (embedded)	420	Gas (CCGT)
Thetford	EPR Thetford Ltd	Bramford (embedded)	41	Biomass



2021

Generation:
Nuclear 1,230 MW, Offshore wind 2,409 MW, Gas 420 MW, Biomass 41 MW
Generation (total): 4,100 MW
Forecast demand: 1,346 MW

How power is transported throughout the network

Each line of pylons on the network carries two electrical circuits. There are four circuits connecting to and from the region – two circuits on the overhead line between Walpole and Norwich to the north and two on the line running west out of Bramford to Twinstead Tee.

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.

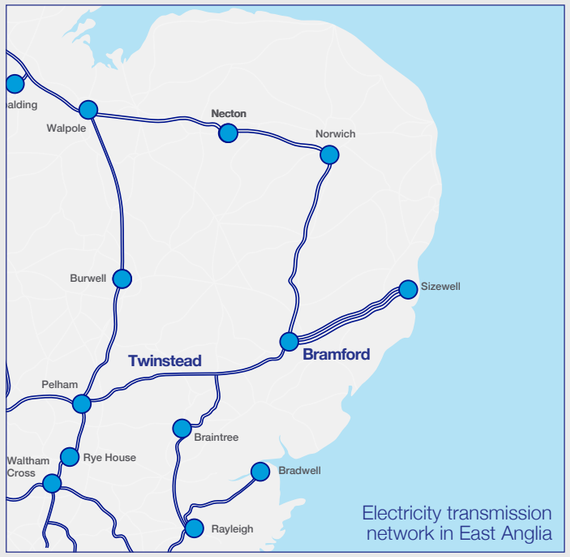
For example, if one circuit is switched out for planned maintenance and another is impacted by a fault at the same time, the Security and Quality of Supply Standard is designed to ensure:

- electricity system frequency is maintained within statutory limits;
- no part of the network is overloaded beyond its capability;
- voltage performance stays within acceptable statutory limits; and
- the system remains electrically stable.

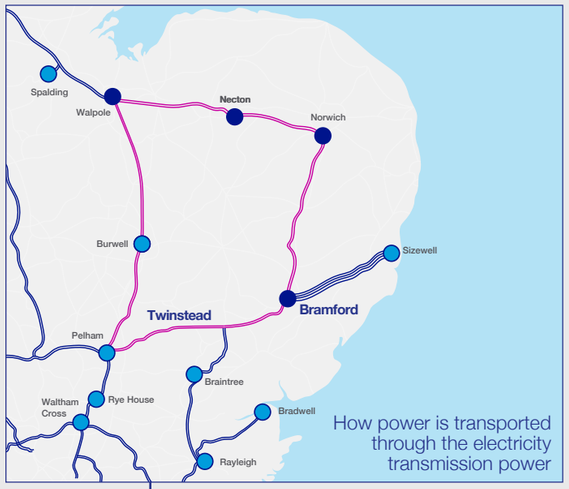
National Grid ESO oversees the standards, however, they are approved by a Security and Quality of Supply Standard panel and Ofgem.

Taking the standards into account, the network today in East Anglia has around 3.5 GW of transfer capability out of the region, with two of the four circuits connecting the region to the wider network out of service.

[15] The East Coast story (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/the-need-for-network-reinforcement



Electricity transmission network in East Anglia



How power is transported through the electricity transmission power

Export Capability
3,546 MW

Future generation and demand

While the network in East Anglia can accommodate the level of generation and demand that there is today, this situation will change over the next decade with the increase in the amount of electricity set to come from offshore wind, interconnectors and nuclear power.

By the end of this decade, if everything contracted to connect in the region does connect, there will be significantly more generation than the current network is capable of accommodating. The table below shows the anticipated demand year on year and how the generation that is contracted to connect to the network is set to grow by the end of the decade.

While that is the contracted position, all of these new sources of electricity may not necessarily connect in the timescales they are contracted to connect in. Some may not be consented, or some may not proceed to final financial investment decisions. However, it is clear that the level of generation that will come into the region far exceeds the current network capability.

From the analysis by the System Operator, some 17.4 GW of offshore wind can reasonably be expected within the Eastern Region off the East Anglia coast by 2030, if the Government's ambition to connect 40 GW of offshore wind in the UK by then is to be achieved[16]. Depending on the Future Energy Scenarios, the System Operator is advising in the latest **Electricity Ten Year Statement**, that the Eastern Region may reasonably see renewable generation capacity rise to between 10 GW and 17 GW in the next ten years[17].

Taking that into consideration and basing their analysis on credible **Future Energy Scenarios**, the System Operator anticipate in the Electricity Ten Year Statement that required transfer and expected power flows grow rapidly from around 2023 to beyond the existing network boundary capability of 3.5GW, suggesting a need for network development to manage the increasing power flows[18].

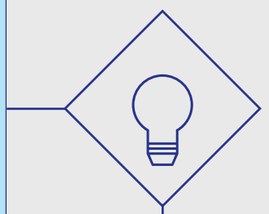
[16] Offshore Coordination Phase 1 Final Report, page 18 (National Grid ESO, 16 December 2020) - Available at https://www.nationalgrideso.com/document/183031/download

[17] Electricity Ten Year Statement, page 43 (National Grid ESO, November 2021) - Available at https://www.nationalgrideso.com/document/223046/download

[18] Electricity Ten Year Statement, page 44 (National Grid ESO, November 2021) - Available at https://www.nationalgrideso.com/document/223046/download

Forecast future generation in East Anglia

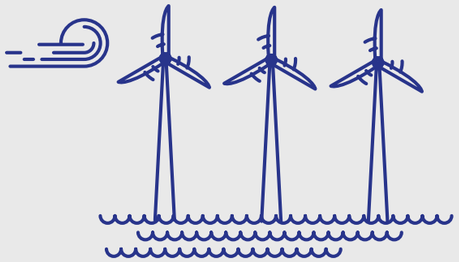
Year	1	2	3	4	5	6	7	8	9	10
Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Demand (MW)	1,346	1,303	1,287	1,280	1,287	1,298	1,312	1,351	1,387	1,413
Generation cumulative total (MW)	4,100	4,448.5	5,748.5	10,015.5	13,215.5	13,215.5	16,775.5	19,175.5	20,845.5	24,459.5



Contracted Generation and Interconnectors
24,459.5 MW

Regional installed offshore wind capacity up to 2050

Offshore Coordination Phase 1 Final Report (December 2020)
https://www.nationalgrideso.com/document/183031/download



Leading the Way Scenario Total Installed Capacity

2050 → 83.1 GW
2030 → 42.0 GW
2025 → 23.9 GW
2020 → 9.6 GW

East Scotland

2050	9.3 GW
2030	5.1 GW
2025	2.8 GW
2020	0 GW

North Scotland

2050	18 GW
2030	6.5 GW
2025	2.5 GW
2020	0.8 GW

Dogger Bank

2050	10.8 GW
2030	7.6 GW
2025	4.5 GW
2020	0.4 GW

N Wales & Irish Sea

2050	15.4 GW
2030	3.7 GW
2025	2.7 GW
2020	2.7 GW

Eastern Regions

2050	27.5 GW
2030	17.4 GW
2025	10.1 GW
2020	4.4 GW

South East

2050	2.1 GW
2030	1.7 GW
2025	1.3 GW
2020	1.3 GW

Increasing the capability of the existing network

Before we consider building new parts of the network, we first must consider whether we can achieve more capability by upgrading parts of the existing network. This can involve using thicker conductors/wires on some of our existing overhead lines and adding smart power control devices to control the flow of electricity on parts of the network to transport it to where it is needed.

Here in East Anglia in the first half of this decade, that is what we will be doing:

- installing power control devices at key substations in the region – at Pelham, Rye House and Waltham Cross, to make more use of an existing route to the west of the region
- increasing the voltage of a section of line from Waltham Cross south into London to 400kV to increase the capability of that part of the network on into the capital
- re-wiring existing overhead lines with larger diameter conductors that can carry more power – for example on the existing overhead lines from Bramford to Braintree to Rayleigh to Tilbury, Twinstead and Pelham and between Norwich and Bramford.

Making these improvements increases the capability of the existing network, but it is still insufficient to deliver the capability that the National Grid ESO advises is required to deliver cleaner, greener energy to homes and businesses beyond the region in line with Government ambitions.

As National Grid ESO has outlined in **NOA** 2020/21, the reinforcement between Bramford and Twinstead is critical in all scenarios and needs to be in place by 2028. The System Operator has also explained in the NOA that other reinforcements are also needed in the region to deliver on the Government's ambition to see 40 GW of offshore wind connected by 2030.

NOA:

The Network Options Assessment (NOA) is an annual report published by National Grid ESO which outlines their recommendations as to which reinforcement projects should be taken forward during the coming year. When a new edition of the NOA is released, National Grid Electricity Transmission will use this to review work already undertaken on the Bramford to Twinstead reinforcement, including the assumptions underpinning its proposals for the reinforcement.

The table below shows the work that is needed on the network in the south east region over the next decade as identified in the 2020/21 **Network Options Assessment**[19].

Option description	Earliest in Service Date (EISD)
Reconductor remainder of Rayleigh to Tilbury	2021
Power control devices at Burwell Main	2022
Reconductor remainder of Coryton South to Tilbury circuit	2022
Reconductor remainder of Bramford to Braintree to Rayleigh route*	2023
Commercial solution for East Anglia – Stage 1	2024
Commercial solution for East Anglia – Stage 2	2024
Power control devices at Pelham	2024
Power control devices at Pelham	2024
Power control devices at Rye House	2024
Power control devices at Rye House	2024
Elstree to Sundon reconductoring	2024
Reconductor Bramford to Norwich double circuit*	2024
Uprate Hackney, Tottenham and Waltham Cross 275 kV to 400 kV	2027
Reconductor the newly formed second Bramford to Braintree to Rayleigh Main Circuit	2028
New 400 kV double circuit between Bramford and Twinstead	2028
New offshore HVDC link between Suffolk and Kent option 1	2029
New 400 kV double circuit in north East Anglia	2030
New 400 kV double circuit in south East Anglia	2030
Thames Estuary reinforcement	2030

*Options moved from hold to proceed following 2020/21 NOA

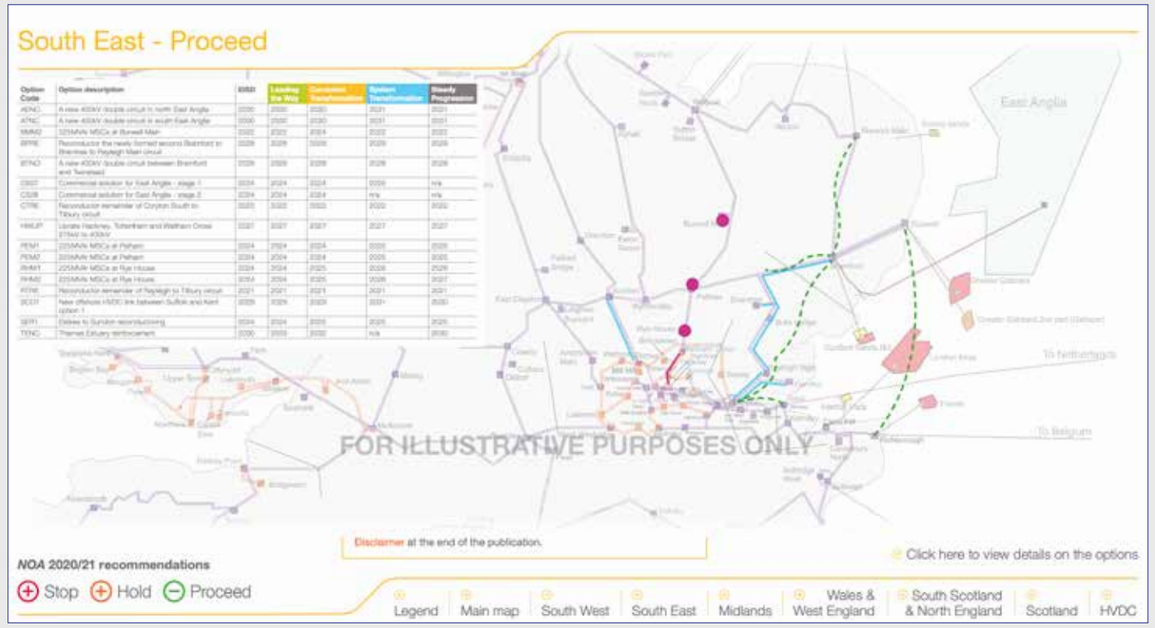
In addition to the network reinforcement between Bramford and Twinstead, a high voltage subsea DC link is required between East Anglia and Kent for 2029 and two 400 kV double circuit reinforcements are needed onshore for 2030 - one in North East Anglia and one in South East Anglia.

Each of those reinforcements, in addition to Bramford to Twinstead, are necessary to deliver the Government's ambition to see 40 GW of offshore wind connected by 2030. Additional work is needed to consider options for those further reinforcements. Each will be taken forward on slightly later timescales than Bramford to Twinstead.

Double circuit:

Most overhead lines are double circuit, carrying an electrical circuit on each side of the pylons.

[19] The 2022 edition of the NOA is expected to reaffirm that Bramford to Twinstead remains a critical network reinforcement. However, the 2022 NOA is not due to be published until after the publication date for this Project Background Document. As such, this section refers to work on the network required in the region as set out in the 2021 NOA, as the most recent version of the NOA available at time of publication.



Network Options Assessment 2020/21, page 56 (National Grid ESO)

East Anglia GREEN (ATNC and AENC in NOA)

Responding to significant growth in, primarily, offshore wind generation and interconnector connections, National Grid is progressing a range of reinforcements to the electricity transmission network in East Anglia, including the provision of secure connections to the network.

This work aims to ensure that there is sufficient capacity to allow the system to be operated in an economic and efficient manner. The East Anglia GREEN project (identified as ATNC/ AENC in the Network Options Assessment) responds to planned new connections onto the National Electricity Transmission System, both in the north of East Anglia and into a proposed connection node substation.

Routeing and substation siting options identification and appraisal is currently being undertaken, informed by National Grid's statutory and licence obligations, relevant National Policy Statements (EN-1 and EN-5) and National Grid's 'Approach to Options Appraisal'. This assessment will give thorough consideration to a range of technical, socio-economic, environmental, cost, and programme issues. Engagement with key prescribed stakeholders will continue in early 2022 with non-statutory public consultation in late Spring 2022 on a preferred route corridor and substation site.

Whilst East Anglia GREEN is far less advanced than the Bramford to Twinstead reinforcement, assumptions have been made to support this statutory consultation, specifically in the preparation of the Preliminary Environmental Information Report. These assumptions are based on the Network Options Assessment and relevant legislation and policy, based on the best available information currently known.

At the point of preparation of the Environmental Impact Assessment, to support the Bramford to Twinstead Reinforcement Development Consent Order application, the project team will consider the latest information available on East Anglia GREEN and undertake an updated cumulative effects assessment as required to do so in planning law and policy.

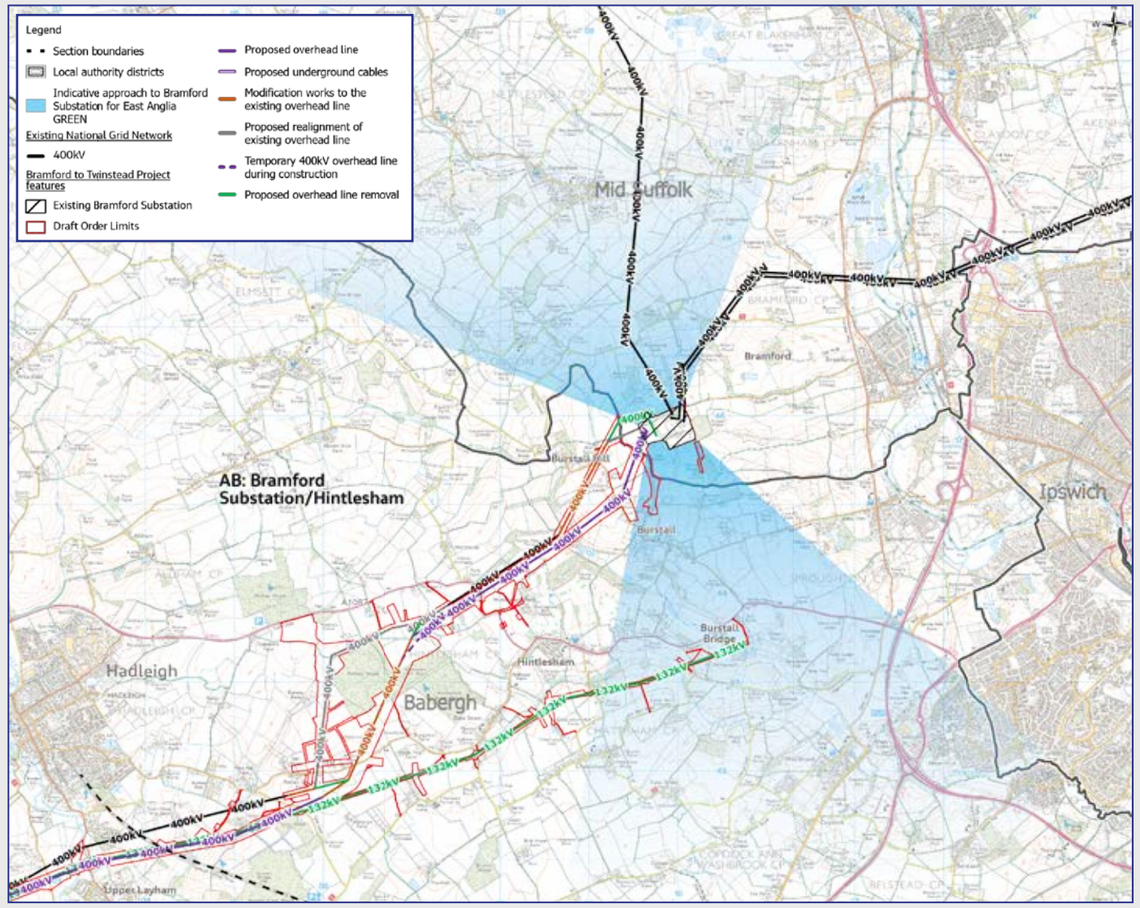
The following assumptions have been made:

- East Anglia GREEN will comprise a new 400 kV double circuit reinforcement from Norwich Main substation to Bramford substation, and a new 400 kV double circuit reinforcement from Bramford substation to Tilbury substation, via a new connection substation in Tendring District. Ongoing optioneering work for East Anglia GREEN is not currently indicating a tripling of the Bramford to Twinstead route
- the siting of the new substation will seek to balance the different effects and costs of connections coming from the points of generation with those for the onward connections to the 400 kV transmission network
- the new reinforcements will be 400 kV overhead lines, except in nationally designated landscapes, where the use of underground cables is assumed
- the new overhead lines will comprise steel lattice pylons of around 50 meters in height, around 360 meters apart, unless other pylon types are required
- the new circuits will connect in to the existing Bramford substation operational boundary
- further mitigation, if required, will be considered as part of the project development process and assessment of the East Anglia GREEN project. This could comprise environmental mitigation including vegetation planting, rationalisation of lower voltage networks or the use of underground cables.
- the construction period will be between 2027 and 2030 (with an anticipated maximum two-year overlap with the Bramford to Twinstead construction).

It is anticipated that the East Anglia GREEN project will evolve in response to the routeing and siting studies currently underway and the subsequent consultation, surveys, design work and environmental assessment. The assumptions made above for the purpose of the Bramford to Twinstead project in no way prejudice the development of the East Anglia GREEN project.

National Grid will continue to back-check its decision-making on both projects in light of new information as the project designs develop including responding to the progression of other inter-related projects. When more detailed information is available it will be shared with other National Grid project teams, to inform their work and ultimately the respective cumulative effect assessments at the point of DCO application.

Indicative approach to Bramford Substation for East Anglia GREEN



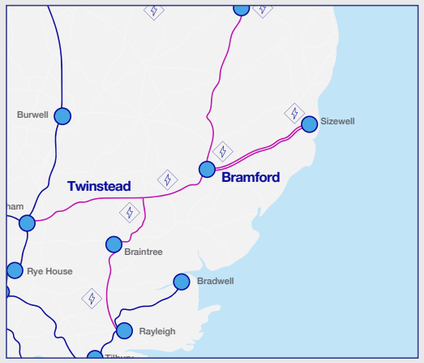
Why Bramford to Twinstead Tee needs reinforcing

We need to reinforce the network between Bramford and Twinstead Tee because that part of the network is a significant bottleneck or constraint to future power flows.

There are currently three double circuit overhead transmission lines carrying power into Bramford – one from Norwich and two from Sizewell. But to the west of Bramford, out to Twinstead Tee, there is currently only one double circuit line carrying power out of the region. With substantial new sources of energy connecting in the region by the end of the decade, the existing overhead line west of Bramford would be overloaded.

Beyond Twinstead Tee there are two routes out of the region – one west to Pelham and one south to Braintree-Rayleigh-Tilbury. Adding a double circuit route between Bramford to Twinstead will remove the current bottleneck on the network and make efficient use of the capacity available in those two routes – one west and one south of Twinstead Tee. Reinforcing the network between Bramford and Twinstead will create two independent double circuit transmission routes west of Bramford – one from Bramford to Pelham and one from Bramford to Braintree to Rayleigh to Tilbury.

If, as a country, we are going to secure the benefits of a cleaner, greener future then the Bramford to Twinstead reinforcement is needed in addition to the other network reinforcements identified in the region. Harnessing the power of offshore wind, greater interconnection with countries across the North Sea and new low carbon nuclear generation, alongside delivering Government ambitions for 40 GW of offshore wind by 2030, will also require the other network reinforcements in East Anglia.



Back-checking strategic options

Prior to our informal consultation last year, we checked again to see whether there may be more appropriate strategic options to address the network bottleneck between Bramford and Twinstead Tee. You can read more about our review in the **Project Development Options Report (March 2021)**[20].

23 strategic options in and around Bramford that might achieve the required reinforcement have been examined, including the original options considered in 2009. These included:

- doing no physical works
- re-directing proposed connections
- maximising existing connections
- reinforcing north of Bramford with new 400 kV network infrastructure
- reinforcing south of Bramford with new 400 kV network infrastructure
- bypassing Bramford with new 400 kV network infrastructure
- reinforcing west of Bramford with new 400 kV network infrastructure.

Those options that would not fully address the constraint or meet the Security of Supply Standard were discounted. We also discounted others that would not offer some material benefit over another option, for example, more expensive options which would provide the same network capacity.

[20] Project Development Options Report (National Grid, March 2021) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

An illustration of all Strategic Options considered is shown below.

After carefully considering our statutory duties and obligations to be efficient, coordinated and economical, and to have regard to the desirability of preserving amenity, reinforcing the network between Bramford and Twinstead Tee was identified as the most suitable option. Of the workable options, it requires the least new infrastructure and has the least impact on communities and the environment compared to other options. It also has the lowest capital cost whilst efficiently addressing the constraint on the network.

A recurring suggestion across the feedback we received at our consultation last year was that we should consider alternatives to reinforcing the network between Bramford and Twinstead, such as an offshore reinforcement or using a different route.

An offshore reinforcement (SEA Link) and two new electric lines (East Anglia GREEN) already form part of our plans for reinforcing the network in East Anglia. These reinforcements alone would not deliver the additional capability required or resolve the specific bottleneck in the network as described above.

The BEIS review of offshore coordination

The Business Energy and Industrial Strategy (BEIS) department's Offshore Transmission Network Review is currently looking at how the offshore electricity transmission network can be delivered in a more coordinated way to deliver net zero emissions by 2050, and we fully support that work.

We will work closely with Government, stakeholders and coastal communities to ensure we play our part to deliver the infrastructure needed to achieve net zero in a way that reduces impacts on communities.

In meeting that challenge there are two key considerations. The first is the way in which we best connect and coordinate the growth of offshore wind farms and interconnectors to the electricity transmission network along the immediate coastline. The second is the network reinforcements required further inland to accommodate the increased demand on the network and to ensure we can effectively transport the power to where it is needed across Great Britain.

This offshore coordination work by Government is ongoing. As explained in **Energy White Paper**, Government will be looking to redesign the current regime to bring more extensive coordination and mitigate environmental, social and economic costs for the 2030s and beyond[21]. While developers will be encouraged, where early opportunities for coordination exist, to consider becoming pathfinder projects, National Grid ESO explains in the 2021 **Network Options Assessment**, that onshore reinforcement is still needed. The System Operator's analysis found that the viable offshore options, in the scenario where 40 GW of offshore wind is achieved by 2030, do not displace any of the onshore reinforcement requirements that have been identified[22].

Notwithstanding how offshore coordination is developed, major onshore development and electricity network reinforcement will therefore still be necessary. To put this into perspective, successfully delivering the Government's 40 GW of offshore wind ambition will require around 500km of onshore and around 400km of offshore electricity transmission network being consented and delivered within this decade across the east side of the country.

The network reinforcement between Bramford and Twinstead Tee is an integral part of this and is considered 'critical' for 2028 by National Grid ESO in all of the Future Energy Scenarios. The 2022 edition of the Network Options Assessment is expected to reaffirm that Bramford to Twinstead remains a critical network reinforcement. As further reports become available (such as the 2022 Network Options Assessment and Holistic Network Design), we will back check our proposals against these to ensure that they remain appropriate.

[21] Energy White Paper, page 80 (BEIS, December 2020) – available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf

[22] Network Options Assessment, page 69 (National Grid ESO, January 2021) – available at https://www.nationalgrideso.com/document/185881/download

The network reinforcement between Bramford and Twinstead Tee is considered 'critical' for 2028 by National Grid ESO in all of the Future Energy Scenarios.

Consultation between 2009 and Spring 2021

Between 2009 and 2013 work was undertaken to develop proposals to add this much needed network capability. Changes to when the planned new generation would come online in East Anglia meant that work was put on hold at the end of 2013.

Now that increased offshore wind and greater interconnection across the North Sea is proposed, backed by Government targets and legislation, in addition to new nuclear at Sizewell C, it is clear network reinforcement is needed. In 2020, work on the project resumed and we will be taking forward the work required to ensure the reinforcement is in place before the end of the decade to carry cleaner, greener electricity to homes and businesses.

Last year, we held a consultation to re-introduce the project, explain how we had reviewed the proposals and why additional capability is needed on this part of the network, and hear your views.

Since the end of that consultation, we have considered all feedback received, undertaken further technical studies, and continued to develop our proposals.

This public consultation will give you the opportunity to see how our proposals for the Bramford to Twinstead reinforcement have developed, read more detailed information on various aspects of the proposals, see how we have considered feedback from our last round of consultation, and give your views on our current plans.

Throughout the lifetime of the project, our proposals have developed through consultation with local communities, landowners and businesses. Until now, this consultation activity has been 'informal' or 'non-statutory.' We are now starting to prepare to apply for a development consent order (which would give us permission to build, operate and maintain the reinforcement). Before we do so, we must undertake a 'formal' or 'statutory' consultation on our proposals.

Our statutory consultation will run between 25 January and 21 March 2022. The statutory consultation is a key milestone in the development of the Bramford to Twinstead reinforcement.

The below sections summarise the public consultation we have undertaken on the project so far. Further details of the evolution of the project design are provided in the **Project Development Options Report (January 2022)**[23].

Whilst in 2020 we revisited all parts of our proposals, and re-introduced our proposals in our 2021 consultation, below is a summary of the consultations that occurred prior to that.

[23] Project Development Options Report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

Stage 1 Consultation

The first stage of consultation on our proposals started in October 2009. During the consultation we explained why the reinforcement was needed, how we had assessed the strategic options and set out in detail each of the four route corridor options under consideration.

We asked people to provide their views on the proposals and on each of the four route corridor options.

Over 3,000 individual consultation responses were received and we used that feedback to review our corridor assessment work and to help identify a preferred corridor.

In July 2011 we confirmed our decision to take forward Route Corridor 2 as our preferred corridor option. It was selected because it followed the route of existing overhead lines and would enable a section of an existing 132 kV route to be removed. This corridor was also considered to give rise to a lower scale of effect on landscape and views than other options.

The detailed reports on strategic options and routing which were presented during the first consultation can also be found in the document archive on our **consultation website**.

Stage 2 consultation

Following the selection of our preferred corridor, we started to develop indicative alignments on the basis that the new overhead line would be close to the existing 400 kV overhead line.

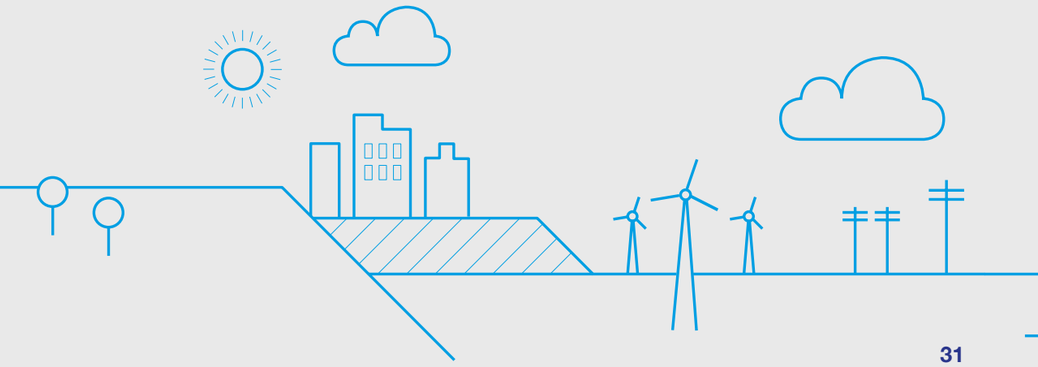
In consideration of the feedback received during stage 1 consultation, we carried out further work to identify whether any specific sections should be partly or wholly undergrounded.

The views of local people were canvassed through a series of Community Forum meetings. Local authorities, environmental bodies and technical specialists gave feedback through several Thematic Group meetings.

In May 2012 we published details of our indicative alignment. It included two sections of the route where the high cost of putting the cables underground was considered justifiable, these were:

- around 4 kilometres from Whitestreet Green to Leavenheath through Dedham Vale, where the landscape was highly valued locally and was designated nationally as an Area of Outstanding Natural Beauty
- approximately 4 kilometres in the Stour Valley, where, after listening to feedback from the public and consultees, it was clear that location was important not just for its high-quality landscape, but also its cultural links with Gainsborough, Constable and Nash.

Each of the underground sections would require **a cable sealing end** compound at each end to connect to the overhead lines. A cable sealing end compound is the structure needed to make the transition from underground cable to overhead line.



Further public consultations were held over the summer of 2012 and, in October of that year, we confirmed our preferred alignment and announced the next steps in the design of our proposals, including:

- deciding on the preferred connection at the eastern end of the route around the villages of Hintlesham and Burstall, and where English Heritage had asked for more information to help it consider how the proposals could affect the setting of Hintlesham Hall
- further consultation on the location of the connection point at the western end of the route where underground cables in the Stour Valley would connect to the existing 400 kV overhead line between Twinstead Tee and Braintree
- identifying a site for a grid supply point substation west of Twinstead, to maintain local electricity supplies and enable the removal of UK Power Network's existing 132 kV line.

Stour Valley West cable sealing end compound

In November and December 2012, we consulted on location options for the cable sealing end compound needed at the western end of the route.

In January 2013, we confirmed our preferred location to the west of the village of Alphamstone.

Selecting the southern site for the sealing end compound meant that more than a kilometre of overhead line and three pylons in the Stour Valley could be taken down in addition to the removal of the 132 kV line between Twinstead Tee and Bramford.

Alignment around Hintlesham/Bramford

Following consultation feedback, we carried out further studies on any potential impacts on the Grade 1 listed Hintlesham Hall and the Hintlesham Woods SSSI. We considered a number of potential overhead alignments and an underground cable route.

After further discussions with statutory consultees, we further developed the alignment. This included changes in pylon positions and inclusion of specific mitigation measures. In August 2013 we confirmed our intention to take this forward.

Grid supply point substation west of Twinstead Tee

Our interim alignment incorporated part of the route of an existing 132kV overhead line owned and operated by UK Power Network, the local distribution network operator. Our proposals included removing approximately 25km of 132kV overhead line from Burstall Bridge to Twinstead and to make space for the new 400 kV line.

To enable the removal of the 132 kV line, we would need to carry out additional work to maintain local electricity supplies. After consultation with UK Power Networks, we confirmed our preferred solution would be to build a new grid supply point substation to the west of Twinstead Tee.

In February 2013 we held a public consultation about the possible site options for the new electricity substation. In August 2013 we confirmed a site near Butler's Wood, directly off the A131 and south of Sudbury, as our preferred location.

Project pause

In November 2013 work was paused when it was apparent that some of the generation projects in the region were not going to come forward as quickly as previously expected. While the need for the reinforcement remained, it was apparent that it would not be needed in the timescales originally envisaged.

Project restart and non-statutory consultation spring 2021

Work on the project resumed in 2020. At this time, we reviewed our proposals as they were in 2013 and found that they broadly remained appropriate and were efficient, coordinated and economical.

Following this, between 25 March 2021 and 8 May 2021 we held a non-statutory public consultation to:

- provide an overview of the project, including the need for the project
- describe how the project was developed before project pause in 2013
- explain how National Grid have reviewed and updated proposals
- gather feedback on current proposals
- outline the next steps, the indicative programme and how proposals will be developed further.

Due to Government restrictions associated with the Coronavirus pandemic, consultation activity primarily took place online. More than 1.1 million people viewed or listened to social media advertising for the consultation, and more than 4,500 people visited the consultation website. A total of 537 feedback responses were received from stakeholders and members of the community.

From this feedback, we learnt that 74% of respondents were concerned about the UK meeting its target of net zero greenhouse gas emissions by 2050, with 43% of respondents recognising the need for the reinforcement.

Around half of all feedback responses indicated a desire to see a reduction in the use of overhead lines, encouraging the further use of underground cable technology and the exploration of alternative solutions for reinforcing the electricity transmission network.

The visual impact of the proposed overhead lines was also raised as a consideration, with several comments also received regarding the potential impacts of the project on the local environment and wildlife. Many individuals asserted their views that undergrounding of the reinforcement route in the Stour Valley remained appropriate.

More information on the feedback received at our Spring 2021 consultation is available in our **Non-Statutory Consultation Report**[24]. We have also indicated in this document where the proposals have changed in response to feedback, or in some areas why this was not possible. This report will also form part of the Consultation Report submitted alongside our Development Consent Order application.

Documents used at non-statutory consultation are available to view in the document library section of our project website.

537 feedback responses

8 local newspapers and magazines advertised our consultation with a **combined circulation of more than 87,235**

4,564 people visited the consultation website

4 deposit locations displayed consultation material

over 1.1 million people viewed our social media adverts

[24] Non-statutory consultation report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

What we have changed following non-statutory consultation

The feedback received from our non-statutory consultation in Spring 2021 has helped to shape and guide the development of the proposals.

As a result of feedback and further assessments which have been carried out, we have made some changes to our plans. These are all detailed in the route sections in the next chapter, but in summary between non-statutory and statutory consultation we are:

- confirming undergrounding in two sections of the route within the Dedham Vale AONB and the Stour Valley project area
- proposing a greater length of underground cables overall
- changing the route and configuration of pylons around Bramford Substation
- considering a further potential option for routeing the overhead line through Hintlesham and Ramsey woods
- proposing a modified route for the underground section to the east of the Dedham Vale AONB
- proposing a modified route for the underground section in the Stour Valley project area
- proposing new locations or designs for three cable sealing ends compounds
- proposing to remove more of the existing 400 kV overhead line running south from Twinstead Tee
- proposing to build full tension gantries at three of the Cable Sealing End compounds, to reduce the overall number of terminal pylons along the route.

To read more about these changes in detail please view our **Project Development Options Report (January 2022)**[25].

[25] Project Development Options Report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

Our proposals for Bramford to Twinstead at statutory consultation

We are seeking your views on our Bramford to Twinstead reinforcement proposals as they currently stand, following input from stakeholders during previous rounds of consultation. This section explains what our plans are today.

We propose to reinforce the electricity transmission network between the existing Bramford Substation in Suffolk, and Twinstead Tee in Essex. We would do this by constructing a new 400 kilovolt (kV) electricity transmission reinforcement over a distance of up to 29 km.

The reinforcement includes up to 19 km of overhead line, consisting of approximately 55 new pylons (around 50 metres tall), and aluminium conductors (the line part). There would also be approximately 10 km of underground cable system, consisting of up to 20 cables (comprising 18 transmission cables and two fibre cables) with associated joint bays and above ground link pillars.

Cable sealing ends are required to facilitate the transition between the overhead and underground cable technology. There would be four cable sealing ends; one at the end of each underground cable section (Dedham Vale East, Dedham Vale West, Stour Valley East and Stour Valley West). Each cable sealing end would be within a fenced compound, containing electrical equipment, support structures, a small control building and a permanent access track.

We are proposing to remove approximately 27.5 km of existing overhead line and associated pylons as part of the proposals (25 km of existing 132 kV overhead line between Burstall Bridge and Twinstead Tee, and 2.5 km of the existing 400 kV overhead line to the south of Twinstead Tee).

To facilitate the overhead line removal, a new grid supply point (GSP) substation is needed at Butler's Wood, east of Wickham St Paul, in Essex. The GSP substation would include two super grid transformers (SGT) to convert the voltage from 400 kV to 132 kV, for onward transmission and distribution to the local distribution network. The GSP substation would include associated works, and replacement pylons, underground cables to tie the substation into the existing 400 kV and 132 kV networks, and a single circuit cable sealing end compound.

The GSP substation will form part of the DCO application and is taken into account in the Preliminary Environmental Information (PEI) Report. However, we are also considering the option of applying for planning permission for the GSP substation under the Town and Country Planning Act, in advance of submission of an application for development consent.

Planning permission for the GSP substation prior to the approval of the DCO application would allow us to remove the existing 132 kV between Burstall Bridge and Twinstead Tee sooner.

At this consultation we are presenting two options for the new 400kV overhead line in the vicinity of Hintlesham Woods. Option 1 runs to the north and west of Hintlesham Woods, whilst Option 2 runs parallel to the existing overhead line through Hintlesham Woods. More information about these options can be found in the **Project Development Options Report (January 2022)**[26].

[26] Project Development Options Report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

Additional activities to facilitate the construction and operation of the proposed reinforcement include the following:

- modifications to, and realignment of sections of the existing 400kV overhead line
- use of temporary land to facilitate construction activities including working areas for construction equipment and machinery, site offices, welfare, storage and access
- constructing temporary infrastructure to facilitate construction activities such as amendments to the highway including bellmouths for site access, pylons and overhead line diversions, scaffolding to safeguard existing crossings, watercourse crossings and diversions of Public Rights of Way
- diversion of third-party assets and land drainage from the construction and operational footprint
- use of land for mitigation, compensation and enhancement of the environment as a result of the environmental assessment process, and National Grid's commitments to Biodiversity Net Gain.

The following chapters provide a summary of our plans. There are also a number of technical documents which will provide a greater level of detail.

For a full description of the proposed project please see Chapter 4 of the **Preliminary Environmental Information Report**[27].

For plans of the proposed project please see the suit of plans and drawings we have prepared. These plans are titled the **General Arrangement Plan and Typical Design and Layout Plans**[28]. To help you interact with these plans, please see our **guide to interacting with our consultation plans**[29].

Draft Order Limits

The consultation plans show the infrastructure proposed within the project's draft Order Limits. These limits form the current anticipated boundary of the entire area within which the Bramford to Twinstead reinforcement could take place, including temporary and permanent works, as well as the works to the existing infrastructure.

Limits of Deviation

The Limits of Deviation (LoD) lie within the draft Order Limits. Limits of Deviation are a common feature of linear infrastructure projects. They provide the necessary flexibility when constructing the authorised development, reducing the risk that the project as approved cannot later be implemented for unforeseen engineering or environmental reasons.

For example, previously unidentified poor ground conditions may require a pylon to be moved for geotechnical reasons, such as ground stability. The Limits of Deviation set specific parameters to moving infrastructure on the ground, as well as controlling changes to the vertical height of the infrastructure.

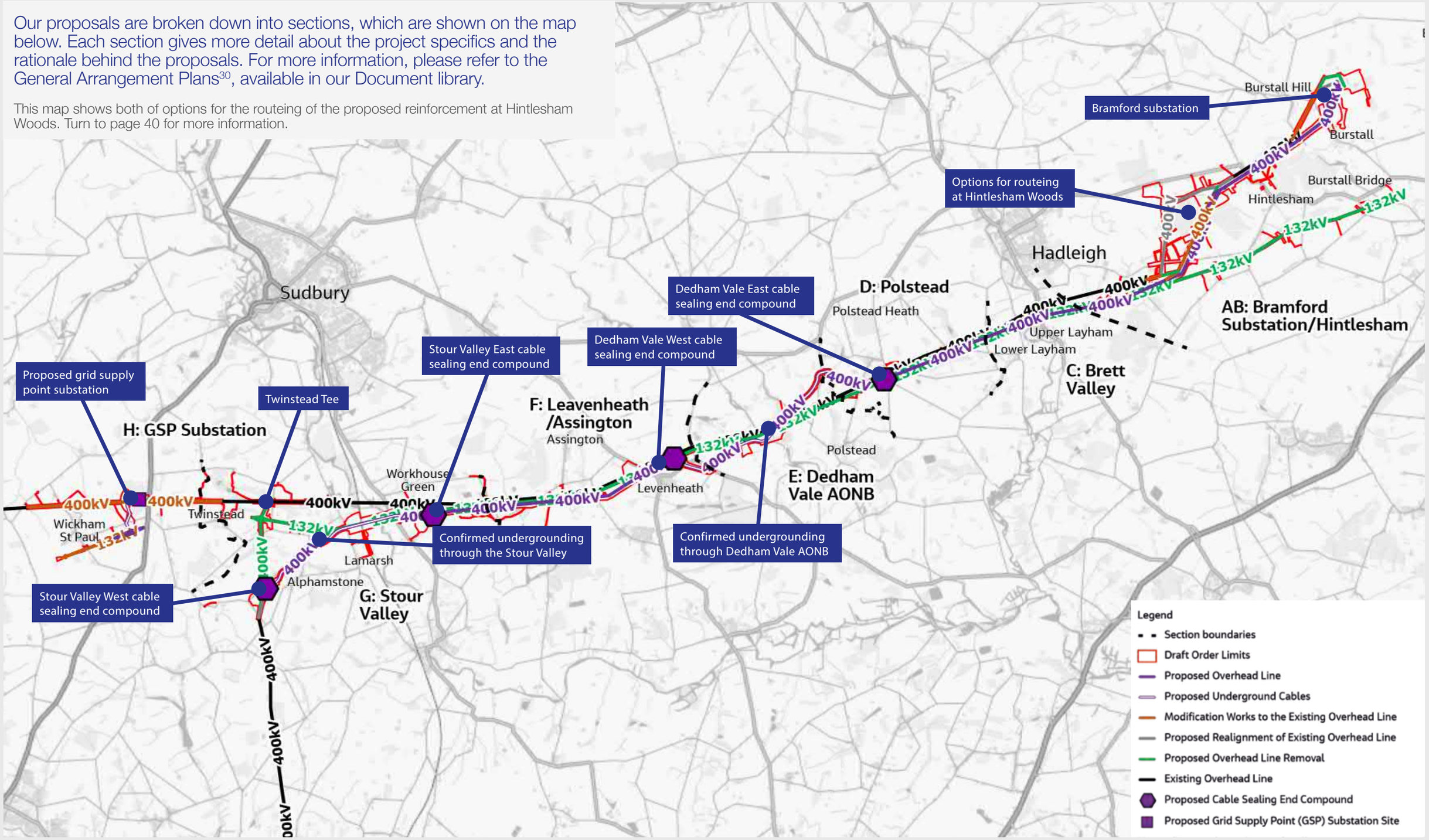
[27] Preliminary Environmental Information Report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

[28] General Arrangement Plan (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

[29] Guide to interacting with our consultation plans (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

Our proposals are broken down into sections, which are shown on the map below. Each section gives more detail about the project specifics and the rationale behind the proposals. For more information, please refer to the General Arrangement Plans[30], available in our Document library.

This map shows both of options for the routeing of the proposed reinforcement at Hintlesham Woods. Turn to page 40 for more information.



[30] General Arrangement Plan (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

Section AB
Bramford to Hintlesham

Our plans in this section

We would build a new overhead line from Bramford substation, to the south of the existing 400 kV line. At the substation, we are proposing some changes to the alignment of both the proposed new 400 kV overhead line and the existing 400 kV line when compared to the alignment presented at our last consultation.

At Hintlesham Woods, we are presenting two options for the routeing of the new line:

- **option 1:** We would build a new section of overhead line to the north of Ramsey Wood, and divert the existing 400 kV line onto these pylons. The new 400 kV overhead line would reuse the existing pylons through the woods. This is the option we presented at our non-statutory consultation.
- **option 2:** We would build a new section of overhead line parallel and to the south of the existing line within Hintlesham Little Wood. In this scenario, the overhead lines would run through the woods, with the pylons being located outside of the woodland.

For both options, we would remove the existing 132 kV overhead line from Burstall Bridge running to the south west of Hintlesham.

Changes since our last consultation

We have made changes to the overhead alignment on the approach to Bramford Substation, to allow for a better electrical configuration at the substation, more efficient construction, and to reduce the number of pylons (changes mean three of the existing 400kV pylons will be removed and replaced with one new pylon).

This section of the route includes the Grade I listed Hintlesham Hall and Hintlesham Woods Site of Special Scientific Interest, which is designated for its ancient woodland and rare birds. We are presenting a second option for the routeing of the alignment around Hintlesham Woods, in response to the feedback we received during our non-statutory consultation in 2021.

Please refer to the **Project Development Options Report**[31] (January 2022) for more information on the options.

[31] Project Development Options Report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

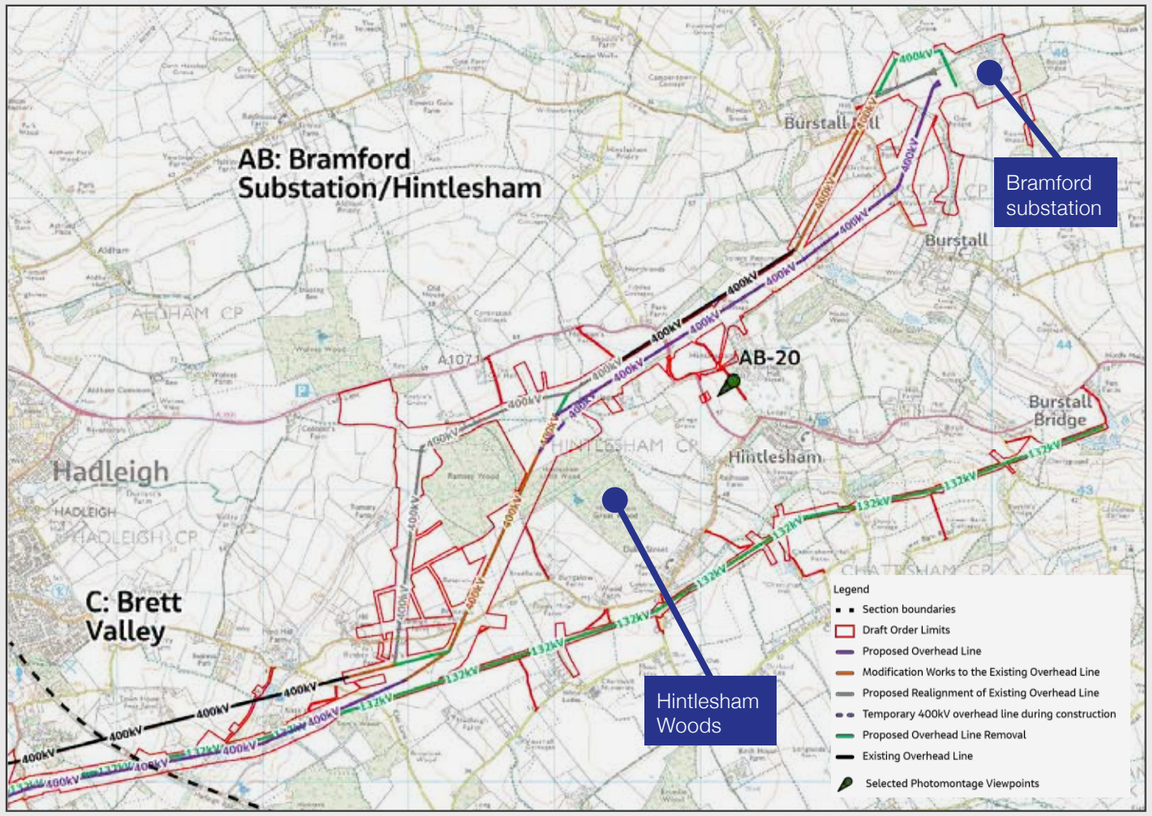
AB-20: View west from Hintlesham Hall – Existing summer baseline Option 01

AB-20: View west from Hintlesham Hall – view in summer once in operation Option 01

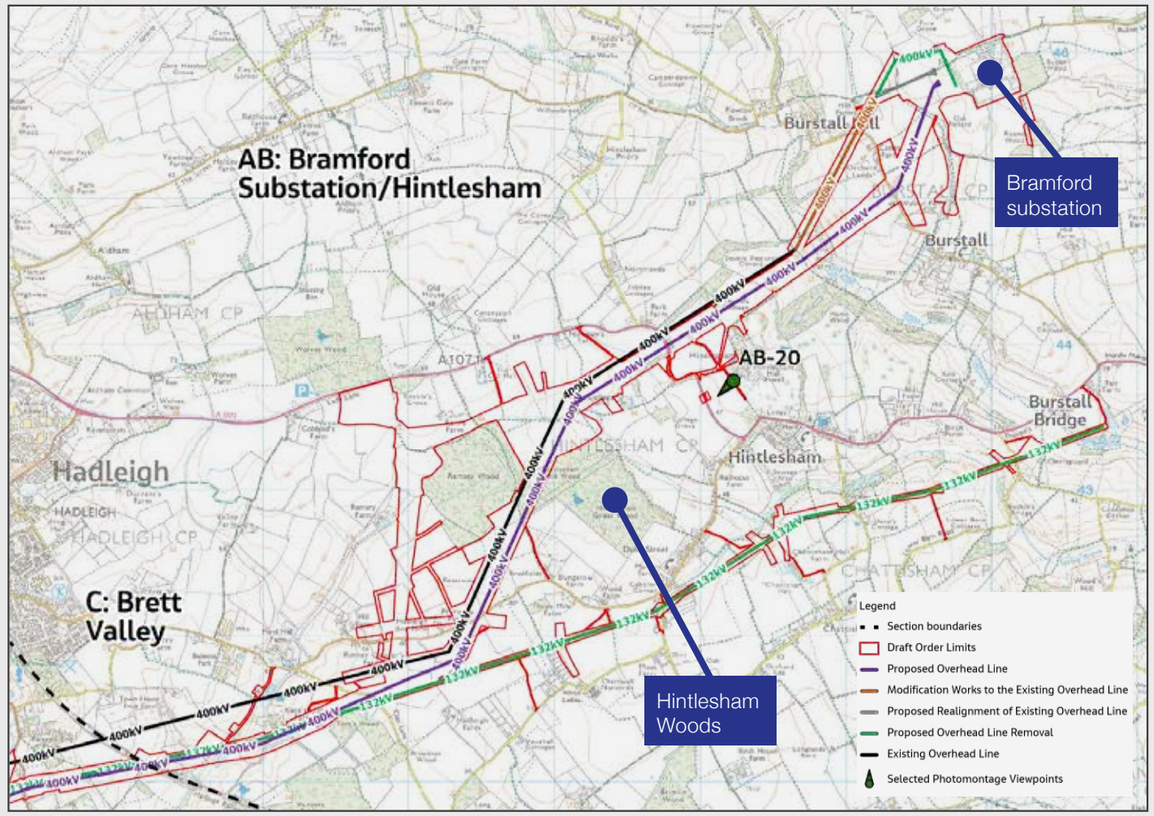
AB-20: View west from Hintlesham Hall – Existing Summer baseline Option 02

AB-20: View west from Hintlesham Hall – view in Summer once in operation Option 02

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.



Hintlesham Woods Option 1



Hintlesham Woods Option 2

Section C
Brett Valley

Our plans in this section

We would build a new 400 kV overhead line in this section, roughly along the same alignment as the existing 132 kV pylons. The line would travel south of Kate's Hill, deviating from the route of the existing 132 kV pylons to the east of Benton Street, with trees screening the pylons in views from Benton Street, when approaching from the Layham direction.

We would remove the existing 132 kV overhead line in this section.

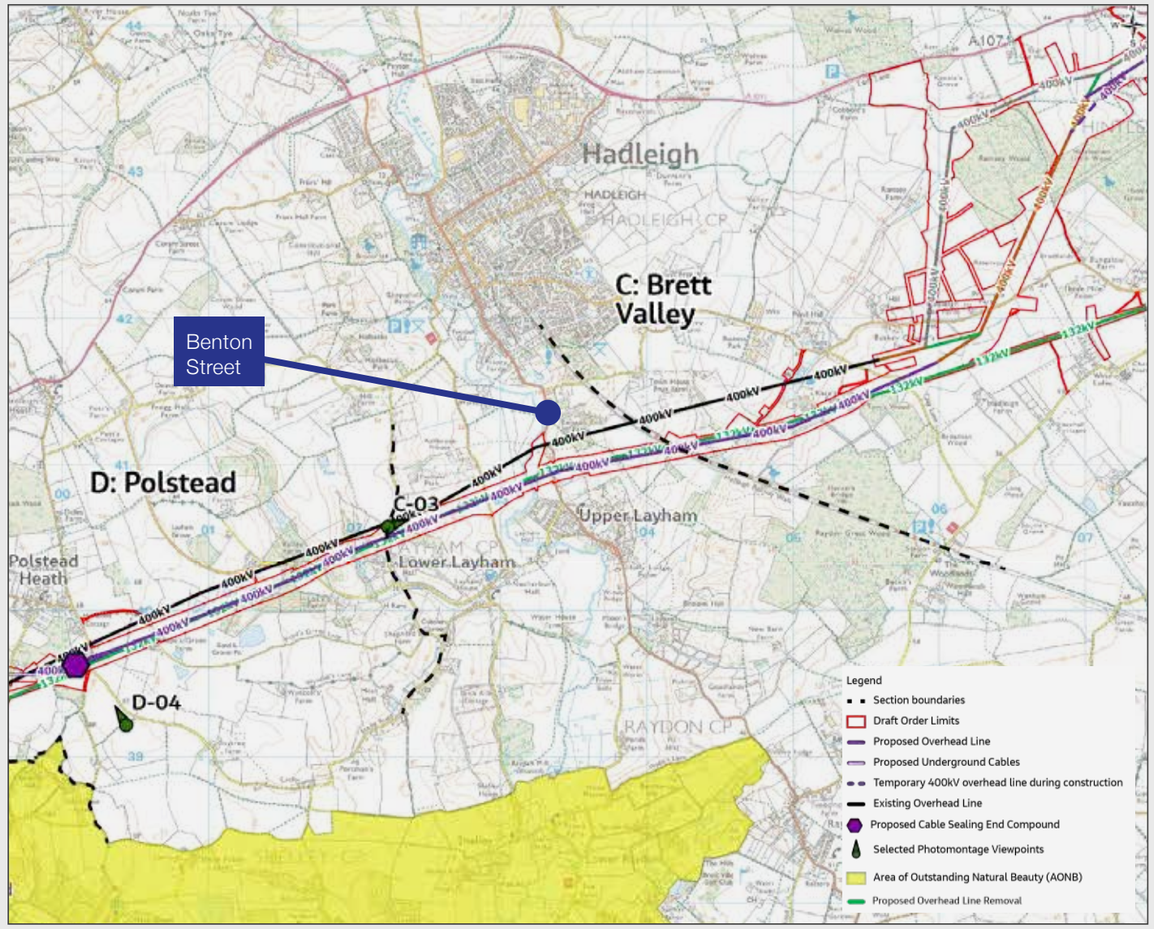
Changes since our last consultation

The route of the proposed alignment has not changed in this section.

C-03: View from Overbury Hall Road – existing view in summer

C-03: View from Overbury Hall Road – view in summer once in operation

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.



Section D
Polstead

Our plans in this section

We would build a mixture of new 400 kV overhead line and underground cables in this section.

The overhead line would roughly follow the alignment of the existing 132 kV pylons, before connecting into the Dedham Vale East cable sealing end compound between two parts of Millfield Wood. Cable sealing end compounds are needed to connect overhead lines with underground cables and vice versa. From here, the reinforcement would continue via underground cables travelling north west, to the north of Dedham Vale AONB.

We would remove the existing 132 kV pylons in this section.

Changes since our last consultation

Following feedback from stakeholders, and keeping in mind our statutory duties, our team of technical specialists have explored several options to relocate the Dedham Vale East cable sealing end compound further away from the boundary of the AONB. The aim of this is to reduce any potential effect on the setting of the AONB and the Conservation Area at Polstead.

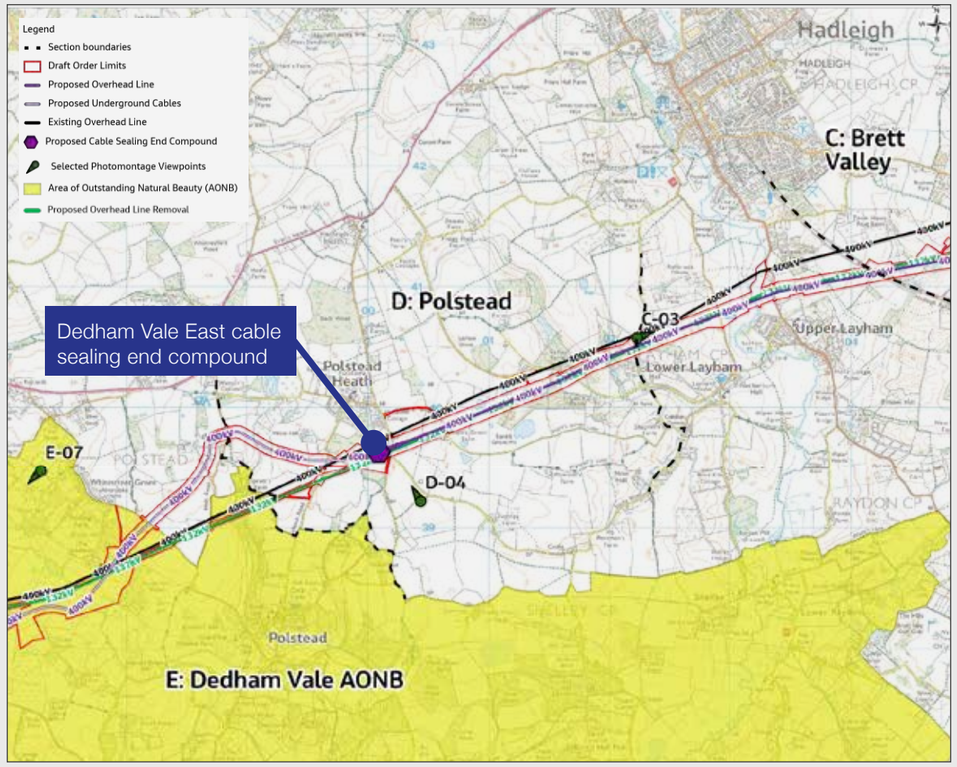
Following these studies, we are proposing to site the cable sealing end compound at a location approximately 1 km from the AONB boundary between two existing blocks of woodland at Millfield Wood. The existing woodland would be retained and would provide visual screening for the cable sealing end compound.

National Grid is now proposing to construct both sections of underground cables using a ducted solution where feasible (with the cable laid within conduits). This would allow the construction teams to pull the cables through ducts laid in the ground. There are engineering advantages to using this method, and it would also reduce the length of time that open trenches are required, meaning that reinstatement of the ground can happen sooner than if a standard open trenching method was used.

D-04: View from the Public Right of Way between Polstead Road and Stoke Road – existing view in summer

D-04: View from the Public Right of Way between Polstead Road and Stoke Road – view in summer once in operation

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.



Contains OS data © Crown Copyright and database right 2020

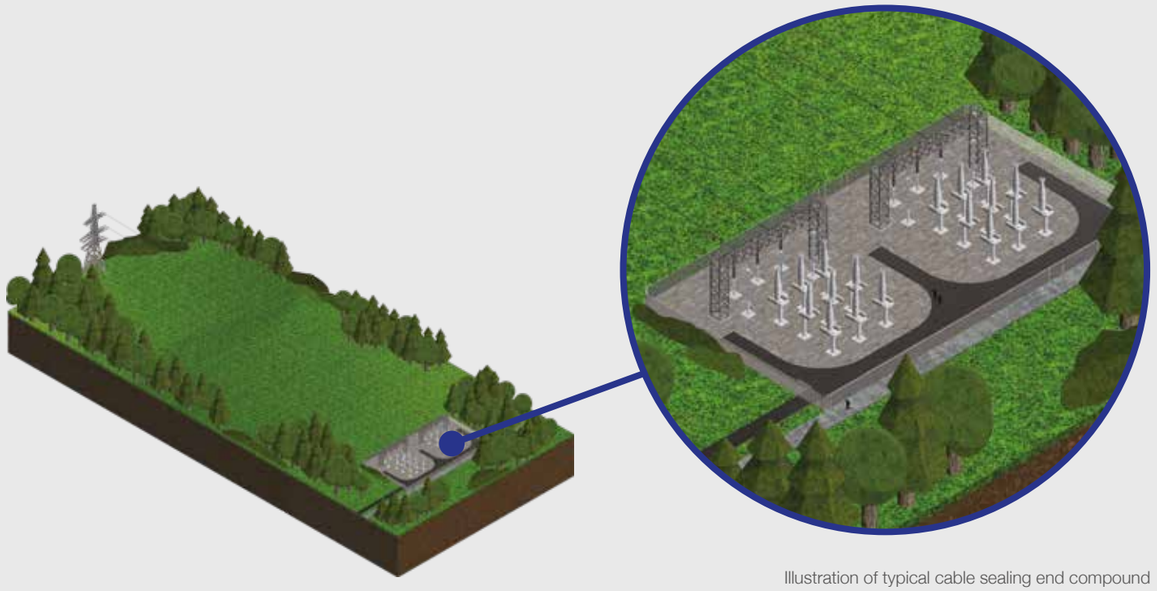


Illustration of typical cable sealing end compound

Section E
Dedham Vale AONB

Our plans in this section

We would build underground cables through the Dedham Vale AONB, south west from Dedham Vale East cable sealing end compound, between Broom Hill Wood and Bushy Park Wood to the B1068.

We would remove the existing 132 kV pylons in this section, meaning that there will be one less overhead line in the Dedham Vale AONB.

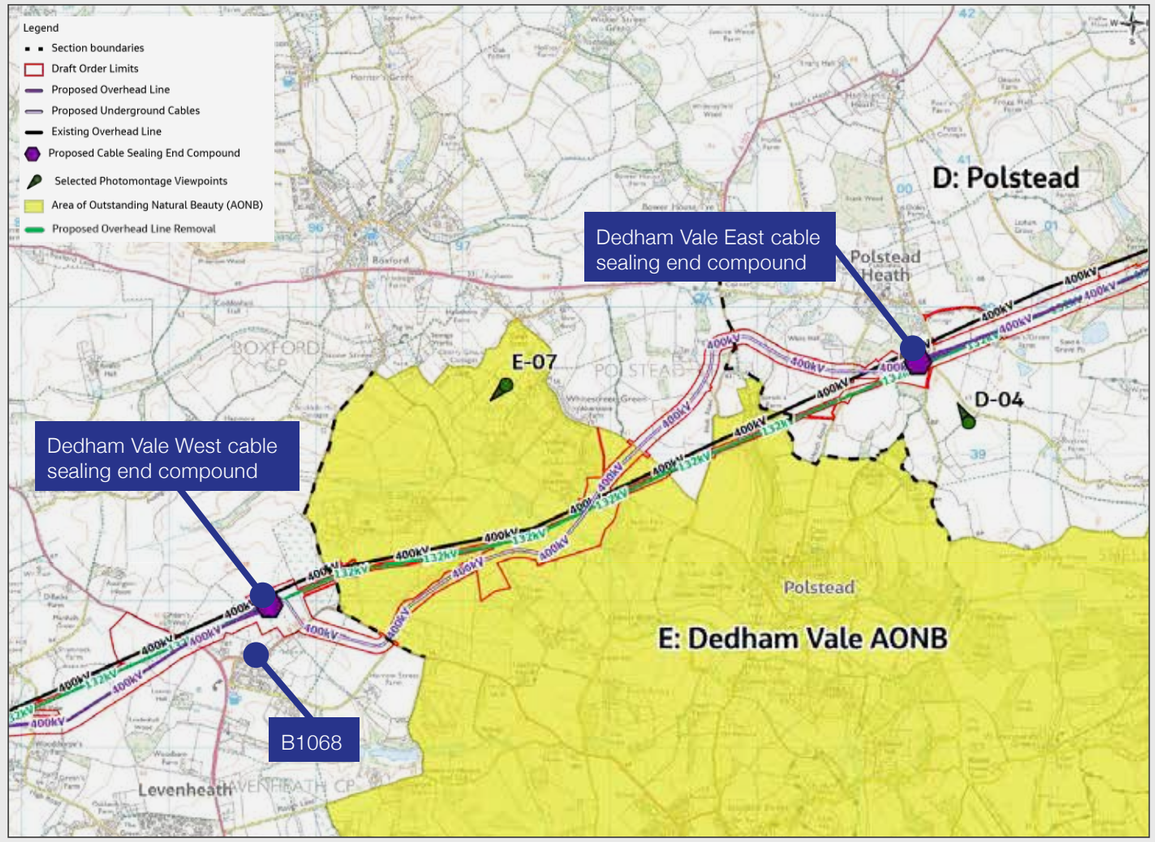
Changes since our last consultation

Following feedback from stakeholders, we can confirm it is our intention to underground the new 400 kV transmission line through the Dedham Vale AONB.

National Grid is now proposing to construct both sections of underground cables using a ducted solution where feasible (with the cable laid within conduits). This would allow the construction teams to pull the cables through ducts laid in the ground. There are engineering advantages to using this method, and it would also reduce the length of time that open trenches are required, meaning that reinstatement of the ground can happen sooner than if a standard open trenching method was used.

At our last consultation, we asked for feedback on an alternative underground cable route at Dollops Wood. Whilst an option was explored to undertake a trenchless crossing beneath this woodland, our assessments suggest that the ground conditions would be unfavourable for this construction technique.

The alternative route to the north avoids Dollops Wood and removes the need for a trenchless crossing beneath the woodland.



E-07: View from the Public Right of Way near Whitestreet Green in Dedham Vale Area of Outstanding Natural Beauty – existing view in summer

E-07: View from the Public Right of Way near Whitestreet Green in Dedham Vale Area of Outstanding Natural Beauty – view in summer once in operation

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.

Section F
Leavenheath and Assington

Our plans in this section

We would primarily build new overhead 400 kV line in this section.

We would construct cables through the Dedham Vale AONB, before connecting into the Dedham Vale West cable sealing end compound to the immediate west of Boxford Fruit Farm.

From here we would build a new 400 kV overhead line, routed to the south of the existing 400 kV line, along a similar alignment to the existing 132 kV pylons.

We would remove the existing 132 kV pylons in this section.

Changes since our last consultation

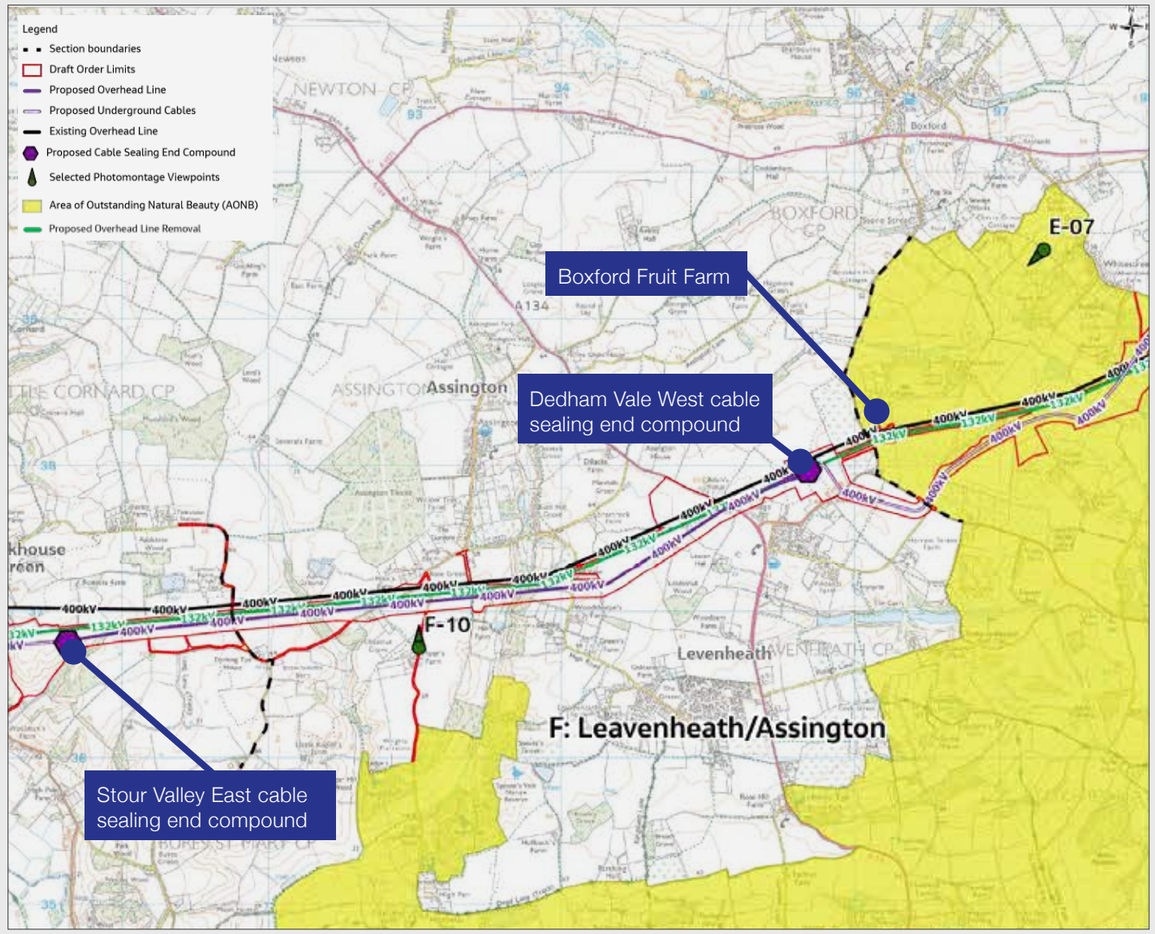
We are not proposing any significant changes to the route of the reinforcement in this section. The location of Dedham Vale West cable sealing end compound remains in roughly the same location as presented at our previous consultation.

We have identified a location for a temporary construction compound off the A132. The compound would include site offices, staff welfare facilities and materials laydown and storage areas. It would be temporary and be removed at the end of the construction process.

F-10: View from the Public Right of Way near Moor's Farm to the south of Assington – existing view in summer

F-10: View from the Public Right of Way near Moor's Farm to the south of Assington – view in summer once in operation

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.



Section G
Stour Valley

Our plans in this section

We would build a mixture of new 400 kV overhead line and underground cables in this section.

We would build a new overhead line on the same alignment as the existing 132 kV pylons, before connecting into the Stour Valley East cable sealing end compound to the south of Workhouse Green.

From here we would build underground cables to take the new reinforcement under the B1508, the Sudbury branch railway line and the River Stour, and continue the underground cables to the south west between Henny Back Road and Moat Lane.

We would build the Stour Valley West cable sealing end compound to the south of Henny Back Road and connect the reinforcement to existing 400 kV pylons to the south of Twinstead Tee.

We would remove the existing 132 kV pylons in this section up to just south of Twinstead Tee, resulting in one less overhead line in the Stour Valley. We would also remove 2.5 km of the existing 400 kV line south of Twinstead Tee.

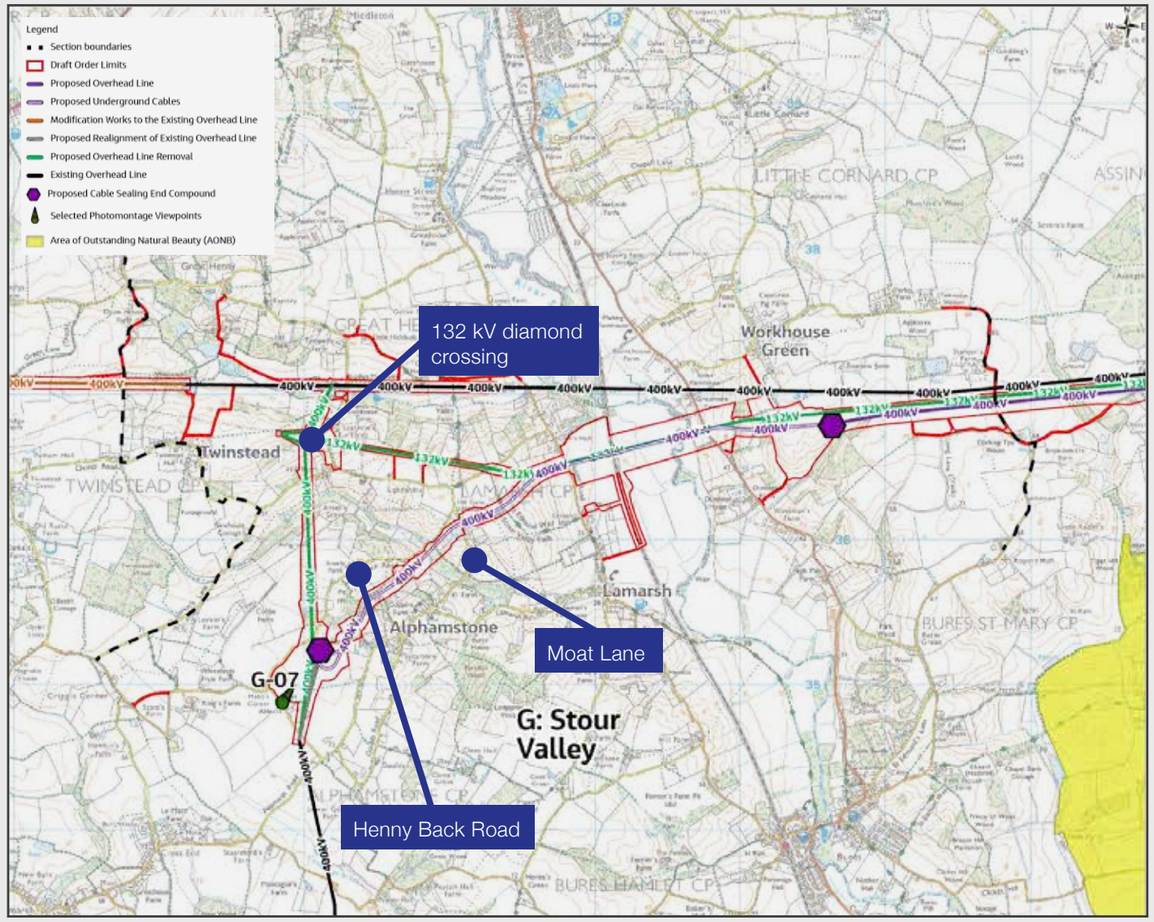
Changes since our last consultation

Following feedback from stakeholders, we can confirm that it is our intention to underground the new 400kV transmission line in the Stour Valley, from the western side of Alphamstone to South of Workhouse Green.

Following feedback received during the non-statutory consultation, we are proposing to locate the Stour Valley West cable sealing end compound further south, on the southern side of Henny Back Road. This will increase the amount of overhead line we can remove between Stour Valley West cable sealing end compound and Twinstead Tee.

We are also proposing a new route for the underground cables in this section, due to ground conditions. At our last consultation, we presented a cable route south of the existing 132 kV overhead line, through Culverdown and crossing Moat Lane north of the junction with Henny Back Lane.

As a result of the changes to the location of Stour Valley West cable sealing end compound, the project team has explored potential options to provide a more direct alignment for the new 400kV cable route (and hence reduce the land disturbance). An alternative route has been identified on the eastern side of Henny Back Road.



Contains OS data © Crown Copyright and database right 2020

G-07: View from the Public Right of Way near Mabb's Corner – existing view in summer

G-07: View from the Public Right of Way near Mabb's Corner – view in summer once in operation

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.

Section H
Grid supply point substation

Our plans in this section

We would build a grid supply point (GSP) substation between Butlers Wood and Waldegrave Wood, off the A131 south of Sudbury, which would include:

- a fenced area housing the GSP equipment, this would be around 270 m by 50 m
- two super grid transformers (SGT) enclosed in a concrete structure
- noise enclosures around the SGT
- other electrical equipment like isolation equipment, switching devices, cooling banks, a generator and a water tank
- new 400 kV underground cable to connect the existing overhead line to the GSP substation

We would also need to build a permanent access track to the compound, along with a single circuit cable sealing end compound. This cable sealing end compound would be smaller than those elsewhere on the route of the reinforcement and would include a gantry up to 15 metres high, and would be connected back in to the GSP via a new 400 kV cable.

We are proposing to build a new 132 kV underground cable to the south of the GSP substation, to connect into the local distribution network (managed by UK Power Networks).

Changes since our last consultation

We are not proposing any changes to the location of the GSP substation, but further engineering work and ongoing discussion with UKPN means that a greater degree of design detail is now available regarding the scale and appearance of the GSP substation.

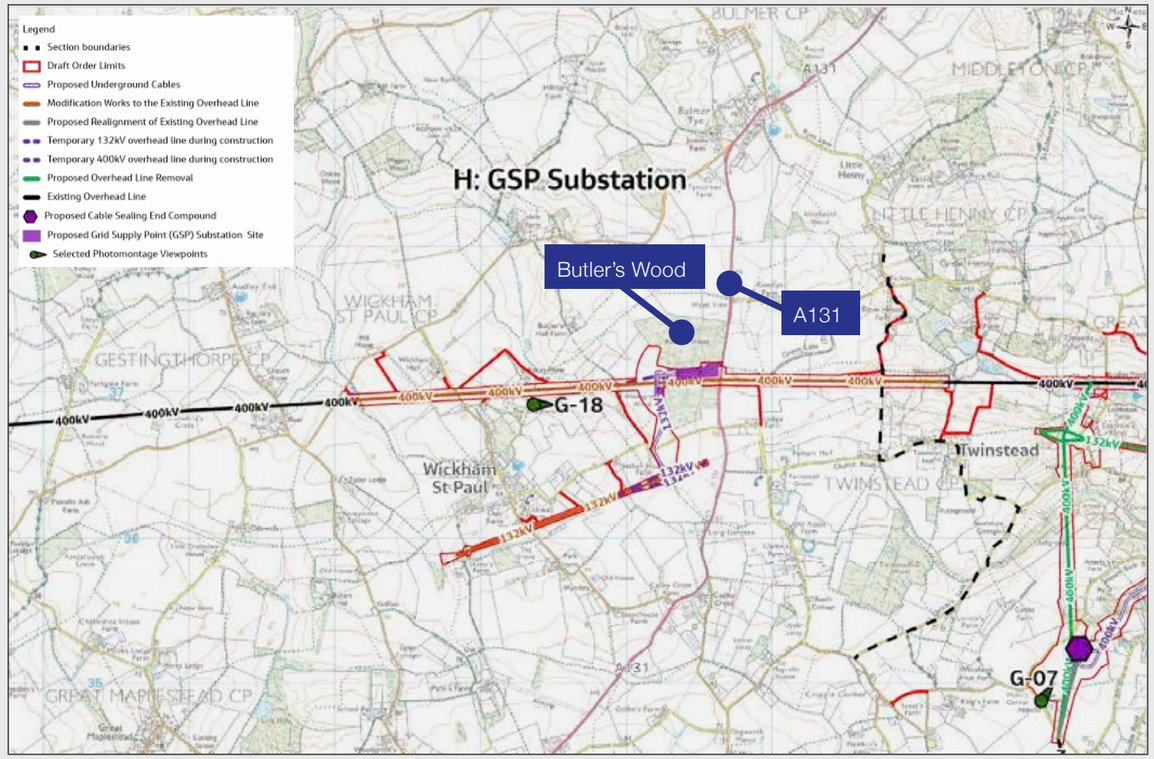
We are considering submitting a separate planning application to deliver the Grid Supply Point under the Town and Country Planning Act. Planning permission for the GSP substation prior to the approval of the DCO application for the rest of the reinforcement would allow us to remove the existing 132 kV pylons between Burstall Bridge and Twinstead Tee sooner. The GSP substation will also form part of the DCO application and is taken into account in the **Preliminary Environmental Information (PEI) Report**.

For more information on the design of the proposed grid supply point substation, please refer to 3.3.1 Typical Design and Layout drawings.

G-18: View from Rectory Lane on the edge of Wickham St Paul – existing view in summer

G-18: View from Rectory Lane on the edge of Wickham St Paul – view in summer once in operation

Please refer to the Visualisations - Photomontages document in our Document library for larger images, additional views and more information.



Contains OS data © Crown Copyright and database right 2020

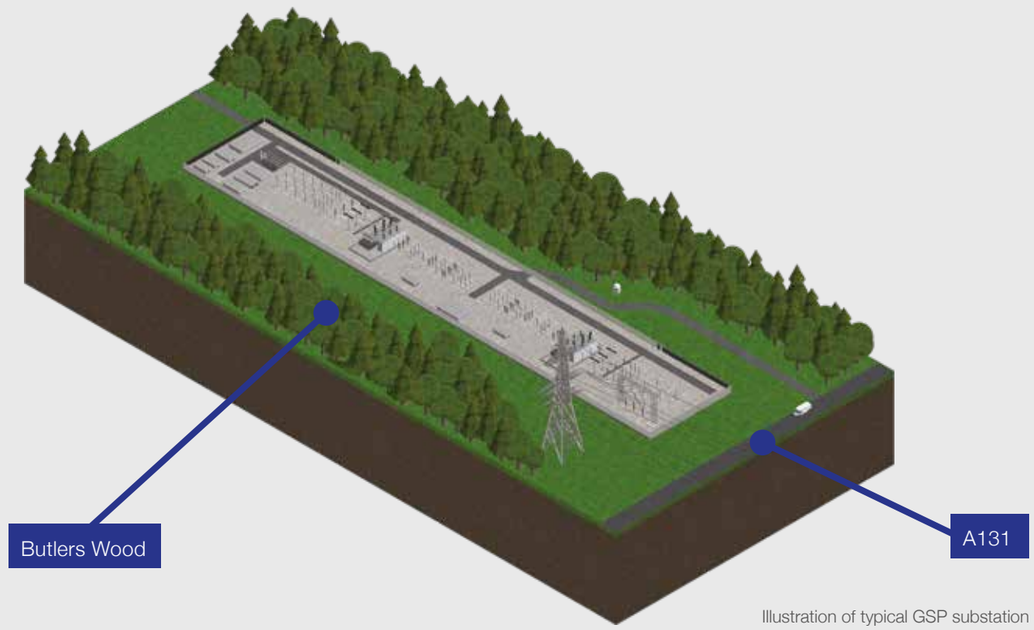


Illustration of typical GSP substation

Information for landowners

Before we can submit our application, we need to understand who has a legal interest in the land in and around the areas being considered as part of the proposed reinforcement.

Whilst much of the information we need is available on public registers, we have appointed land referencing firm WSP to contact individual landowners to verify the publicly available information. This is to ensure that the information is up-to-date and to ascertain the current occupation of the land. We have also appointed land agency firm Bruton Knowles to assist with contacting landowners and occupiers and arranging access for non-intrusive and intrusive surveys to be carried out along the route.

Following our statutory consultation, we will contact all Persons with an Interest in Land (PiL) to open a dialogue in order to negotiate voluntary rights to construct the scheme if it was to be granted planning consent.

We encourage you to appoint an agent/surveyor to act on your behalf where we are seeking rights to carry out works on your property. An agent/surveyor will advise you on the process, your rights and will handle any compensation claims on your behalf. We will reimburse you for professional fees reasonably incurred in respect of all claims and advice on legal agreements in connection with associated land rights. More information on this can be found within our **Land Rights Strategy** and **Payment of Surveyors Fees** documents, which are available on our project website.

Detailed plans and guides

As part of our statutory consultation materials, we have produced a set of detailed plans which show the infrastructure proposed within the proposed reinforcement's draft order limits. These limits form the current anticipated boundary of the entire area within which the Bramford to Twinstead reinforcement could take place, including temporary and permanent works, as well as the works to the existing infrastructure.

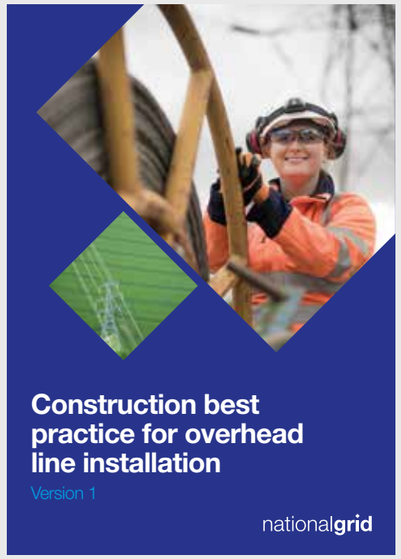
You can view detailed plans for each area of the proposed reinforcement by viewing General Arrangement Plan and looking at documents 3.3.1a 3.3.9. These plans are also available on our project website both in our document library and on the interactive draft order limits plan.

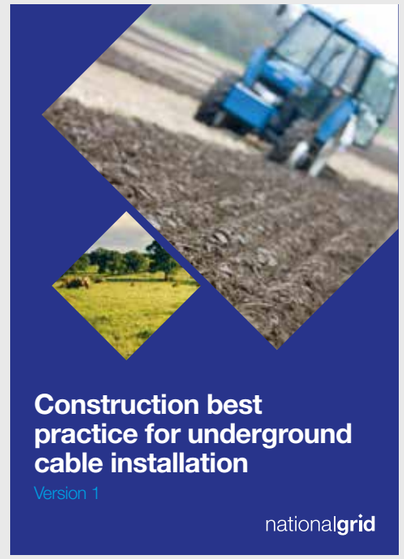
Best practice guides

We have produced 'Best Practice' guides which show how National Grid construct overhead lines and underground cables. You can view these guides on the project website.

Whilst National Grid will adopt the best practice as set out in these documents wherever it is possible and reasonably practical, there will be some instances where we cannot do this. You can find information about the specifics of constructing the Bramford to Twinstead Reinforcement in the Preliminary Environmental Impact Report, which is available in our Document Library.

If you are a landowner and want to talk to our lands team please call **01452 889000** or email: **bramford-twinstead@brutonknowles.co.uk**





Preliminary Environmental Information Report – Non-Technical Summary

The Environmental Impact Assessment (EIA) is a process that is used to identify the likely significant effects that could occur as a result of a project.

The information gathered is taken into account by the decision-making body when determining the application for development consent. The Scoping Opinion was issued by the Planning Inspectorate on behalf of the Secretary of State in June 2021. The Scoping Opinion will directly inform the scope, level of detail and information to be provided in the Environmental Statement which will be submitted with the application for development consent. This will identify the likely significant effects that would result if the project is implemented, and any proposed mitigation to avoid or reduce those significant effects.

As part of the Statutory Consultation, we have published the **Preliminary Environmental Information (PEI) Report**[32] which sets out the environmental assessment work undertaken to date and whether there are likely to be significant effects for each scoped in aspect. The assessment distinguishes between effects that would occur during construction of the project and those that would occur during operation.

This section provides a summary of some of the key topics from the PEI report, which you can read in full by visiting our project website or one of our deposit points. You may also request a paper copy be posted to you, although this may attract a printing charge.

Landscape and Visual

The project is located near to and crosses a number of landscape designations including the nationally designated Dedham Vale Area of Outstanding Natural Beauty (AONB) and four locally designated Special Landscape Areas. Although not a designation, the Stour Valley is also identified as an area that has similar picturesque landscape qualities to Dedham Vale AONB, being valued for its similar gently undulating river valley topography, medieval settlement pattern and rural characteristics.

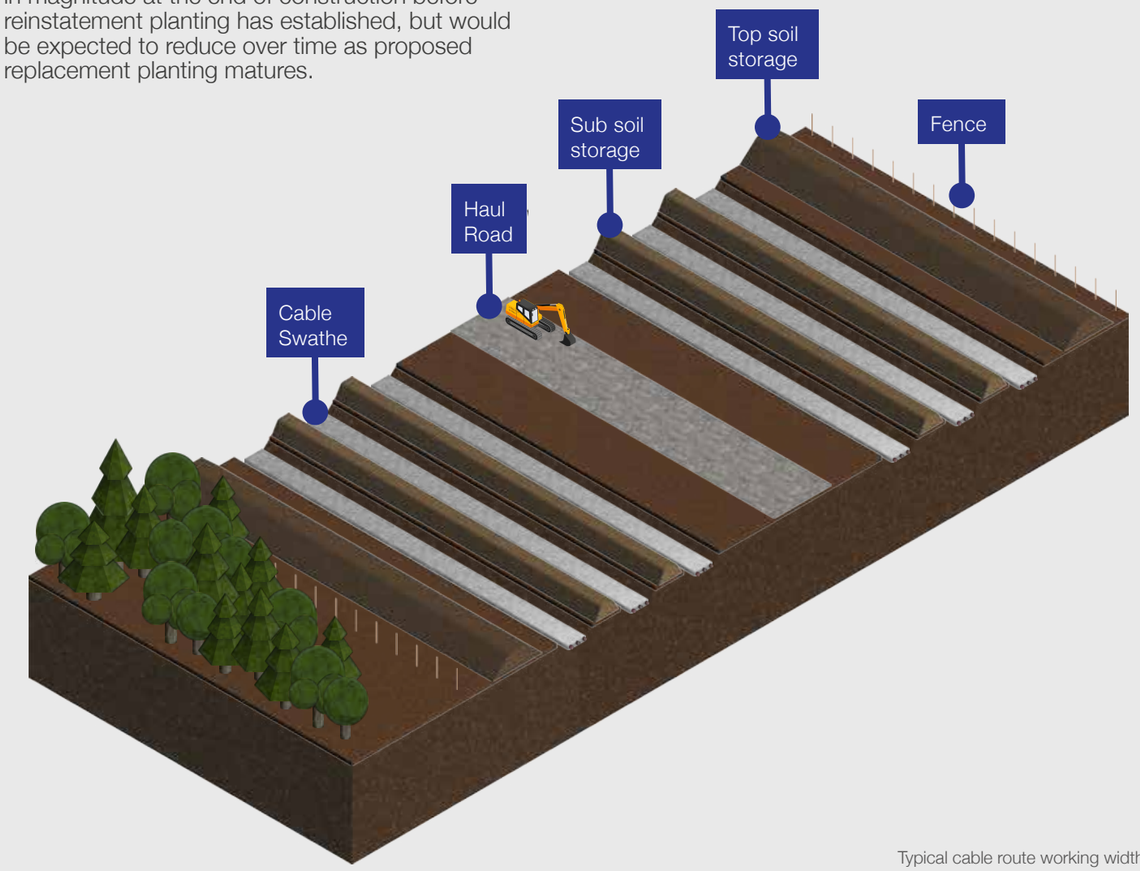
The project crosses a landscape which comprises a low-lying topography of flat to gently undulating landform, and wide, flat river valleys. Topography becomes more rolling to the west of the River Stour, around Twinstead. Major watercourses within the study area typically flow north to south, including the River Brett, River Box, and River Stour, with topography gently rising between these river corridors.

[32] Preliminary Environmental Information Report (National Grid, January 2022) - Available at https://www.nationalgrid.com/uk/electricity-transmission/network-and-infrastructure/bramford-twinstead/document-library

The greatest landscape and visual effects are likely to occur during construction. This is most notable because of the impacts of vegetation clearance in construction swathes and the presence of construction machinery within the landscape. These effects are likely to occur along the full length of the project, with effects varying according to the landscape in each section.

Landscape and visual effects are likely to be greater in magnitude at the end of construction before reinstatement planting has established, but would be expected to reduce over time as proposed replacement planting matures.

Significant visual effects are likely to occur where community and recreational receptors are moving within and around areas close to the draft Order Limits, where they will experience views of the construction working area. Changes to views would diminish with increased distance from the project, and where there is screening from intervening vegetation and/or landform.



Typical cable route working width

During operation, landscape effects are likely to be more similar across the project because overhead lines are already a feature in the existing landscape. Whilst the removal of the existing 132 kV overhead line and introduction of the larger proposed 400 kV overhead line broadly in its place would be likely to intensify the visual effects in relation to the baseline, effects are unlikely to be significant unless close to the project, since overhead lines are already components in baseline views. Beneficial visual effects are likely to occur where the existing 132 kV and 400 kV overhead lines are removed, for example within Dedham Vale AONB and the Stour Valley.

Significant visual effects are likely to occur in operation where community and recreational receptors are moving within and around areas very close to the overhead line elements of the project. Changes to views as a result of the project are likely to diminish with increased distance from the project, and where there is screening from intervening vegetation and/or landform.

The proposed cable sealing end compounds and grid supply point substation and other above ground elements of the project are unlikely to result in long-term significant landscape and visual effects during operation once the planting has matured.

Some of the visualisations are presented throughout this document, however, you can view our full Visualisations – Photomontages document on our **project website**.

Biodiversity

Hintlesham Woods SSSI is located within the draft Order Limits and is designated for its ancient woodland habitat and breeding bird assemblage. It is also managed by the RSPB as one of their reserves. Hadleigh Railway Walk LNR is also located within the draft Order Limits and is designated for its woodland habitat. There are also a number of non-statutory designated sites located within the draft Order Limits including Layham Pit Woodland and Meadows, Loshes Meadow Complex and Alphamstone Complex.

There are numerous blocks of ancient woodland and veteran trees within or adjacent to the draft Order Limits, including Hintlesham Little Wood and Waldegrave Wood. There are also priority habitats (habitats of principal importance in England) including lowland meadows, coastal and floodplain grazing marsh, hedgerows, rivers, and ponds. A full habitat survey is being undertaken by the project to understand the habitats present and their condition.

A number of protected species are present across the project area including rare species of bat, dormouse, reptiles and badger. Ecological surveys are being undertaken to confirm the presence and extent of these protected species to inform the design and mitigation measures on the project.

During construction, there is likely to be disturbance to protected species, including bats, dormouse and water vole, from noise, dust and light. The good practice measures set out within the Outline Code of Construction Practice (CoCP) in Appendix 4.1 of the Preliminary Environmental Information Report, will help reduce effects on protected species.

In addition, we will be applying for protected species licences from Natural England, which will include any specific measures required to avoid harm and the risk of disturbance to protected species. Mitigation is likely to include additional planting and provision of bat roost boxes and dormouse nest boxes.

During construction, there would be temporary loss of habitats within the draft Order Limits. This would include loss of hedgerows and trees along the working area. In many areas, the vegetation can be replanted and the habitat reinstated or allowed to naturally regenerate following construction. Further planting is also proposed to further reduce the impact of the project on habitats.

Significant medium to long term effects are likely to occur where the alignment passes through areas of woodland, particularly areas of ancient woodland such as at Hintlesham Woods SSSI. Ancient woodland is an irreplaceable habitat due to the time it takes to establish, and any loss or damage cannot be mitigated, only compensated. Loss of ancient woodland and interest features within the SSSI would result in a significant effect on both the habitat and the designated features.

National Grid is undertaking further assessment and design work to understand the impact of the project on Hintlesham Woods and whether sensitive features can be avoided during construction. Mitigation is likely to include maintaining a 15 meter buffer from ancient woodland where practicable and identifying specific methods for working within the rootzone of ancient woodland and veteran trees where works cannot be avoided.

During operation, there is a low risk of bird strike, where birds can collide with overhead features. This is considered a low risk as the new 400 kV overhead line will generally replace the 132 kV overhead line (existing feature) and will generally parallel the existing 400 kV overhead line.

Historic Environment

There is one scheduled monument within 250 metres of the draft Order Limits, comprising a medieval Moated Site, situated approximately 180 metres from the draft Order Limits in Section AB: Bramford Substation/ Hintlesham. There are 91 listed buildings including two Grade I and three Grade II* within 250 metres of the draft Order Limits. The closest is Hintlesham Hall, which lies immediately to the south of the draft Order Limits in Section AB Bramford Substation/Hintlesham.

There are a number of known non-designated assets with archaeological interest within the draft Order Limits, including assets dating back to Roman and prehistoric times. Known features include moated sites and round barrows. In addition, there is likely to be archaeology that lies beneath the surface that is currently not recorded. We are undertaking geophysical surveys and trial trenching to gain an insight into the extent of these currently unknown archaeological features.

During construction, there is the potential for works to damage archaeological features through soil excavation, compaction of the soil and changes to groundwater levels. This will be mitigated by following the approach set out within the Archaeological Framework Strategy. This comprises site surveys using geophysical techniques and excavation to understand the archaeological potential. The results of these will inform a proportionate programme of archaeological works to record and advance the understanding of any heritage assets affected by the project.

During construction, some historic landscape character elements are likely to be impacted. This could include creating gaps within historic hedgerows and crossing of features such as protected lanes. These features would be reinstated following construction and would be further mitigated by the addition of planting that is sympathetic to the historic landscape character.

During operation, there could be adverse effects on the setting of heritage assets, such as listed buildings. This will focus on areas where the project would result in an additional overhead line within the setting, such as in Section AB Bramford Substation/Hintlesham. Specifically, there is the potential for a significant effect on Hintlesham Hall (Grade I listed building) and the associated service ranges, stables, former coach house and brewhouse (Grade II*). Specific mitigation measures would include sympathetic landscape planting. We are discussing the mitigation proposals with Historic England.

Areas where the proposed 400 kV overhead line will replace the existing 132 kV overhead line are less likely to create a level of change to the baseline setting of heritage assets that would be significant. The project is also unlikely to result in significant effects, as embedded design and good practice measures, including proposed planting, are likely to effectively limit intervisibility. There is also the potential for beneficial effects on the setting of heritage assets where the current overhead line would be removed, for example within the Dedham Vale AONB and the Stour Valley.

Water

There are five main rivers in the study area namely the Belstead Brook, the River Brett, the River Box, the River Stour and the Henny Meadow Fleet. There are also numerous tributaries of these rivers, classified as ordinary watercourses. The watercourses generally flow in a northwest to southeast direction towards the Stour and Orwell Estuaries. The Rivers Box, Brett and Stour support abstraction of water for a range of uses, including agricultural spray irrigation, and industrial processes.

Most of the study area is at low risk of flooding from rivers (in Flood Zone 1). The main sources of flood risk within the study area are the River Brett, River Box, River Stour and Belstead Brook, with areas of Flood Zones 2 and 3 (medium to high risk) associated with these watercourses. Flood risk from surface water runoff varies across the study area, with most areas at low risk from this source.

During construction, there is a risk that construction works could impact on watercourses through the risk of pollution or changes to channel features where the underground cables or haul route cross a watercourse. The good practice measures set out within the Outline CoCP would reduce the risk of pollution and the channel features would be reinstated following construction. Therefore, there are no likely significant effects expected in relation to the water environment during construction.

Flood risk and land drainage effects during operation have been avoided through design - locating vulnerable components, such as the grid supply point substation and cable sealing end compounds, in areas of low flood risk (Flood Zone 1). Therefore, there are no likely significant effects expected in relation to the water environment during operation.

Traffic and Transport

The A120, the A12 and the A14 provide strategic connections and other primary roads near the project include the A1071, A134 and A131. The remainder of the study area comprises B-roads and lanes providing access to towns, villages and individual properties and farms. The Sudbury Branch Railway Line is a single-track railway branch line running north-south through the project area between Marks Tey and Sudbury.

The project area includes two routes on the National Cycle Network (NCN 1 and NCN 13), which include both on-road and off-road sections. There are also numerous other public rights of way (footpaths, bridleways and byways) and horse-riding is a popular leisure activity around Bramford, Hintlesham, Shelley, Layham and Twinstead.

Construction traffic forecasts indicate that the peak of construction would be in November 2024, with a daily peak of nearly 600 construction vehicles (two way). These construction vehicles would be split across 60 access points across the project area. Millwood Road is predicted to experience the highest impact as a result of the construction traffic, with an expected impact of just over one additional vehicle every 10 minutes.

National Grid will be preparing an Outline Construction Traffic Management Plan, which will be submitted with the application for development consent. This will set out the proposed construction routes and timing of deliveries to avoid peak (e.g. rush hour) periods. With the relatively low number of vehicles which would be spread both over the project area and over the total working day, and the good practice measures set out in the Outline CoCP, there is unlikely to be a significant effect on the highway network during construction.

National Grid is discussing the construction method at the Sudbury Branch Railway Line with Network Rail. The current assumption is that the railway would not be closed during installation of the underground cables, but there may be some changes to service.

The draft Order Limits cross a number of public rights of way. Some of these will require a temporary closure and/or diversion to keep people safe during construction. It is assumed that there would be greater flexibility in the overhead line sections compared to the underground cable sections, to keep any temporary closures short in duration and to allow diversions of the public rights of way around the working area. All public rights of way will be reinstated and reopened by the end of construction.

There would be very small numbers of vehicles used during operation. These would be associated with monthly inspections of equipment or with maintenance and refurbishment activities. Therefore, there are no likely significant effects on traffic and transport during operation.

Noise and vibration

There are a number of noise sensitive receptors throughout the project area. These include residential properties for example at Burstall, Hintlesham, Layham, Lamarsh, and Alphamstone. It also includes non-residential features such as churches and schools.

Given that the project is located in a rural location, existing ambient and background noise levels are generally low during both daytime and night-time periods, with higher noise levels expected close to existing roads, particularly the A1071, A134 and A131.

There will be noise and vibration generated during construction both from construction vehicles and plant operating within the working area, and also from the increase in traffic on the local road network. Many of the particularly noisy and high vibration activities, such as piling, would be for a short duration and would be localised. The good practice measures set out within the Outline CoCP, such as positioning plant away from sensitive receptors where practicable, would reduce noise and vibration effects to sensitive receptors.

The noise assessment presented at application will identify whether additional noise measures, such as screening, would be required at any specific locations. With such measures in place there are unlikely to be significant effects in relation to noise and vibration.

The underground cables and cable sealing end compounds would not generate noise. Embedded measures relating to the noise assessment include a noise enclosure around the transformers at the grid supply point substation and that the designs assume triple Araucaria conductors on standard lattice pylons. These measures would reduce operational noise and there is unlikely to be a significant effect during operation.

Cumulative effects

Cumulative effects are the result of multiple actions on environmental receptors or resources. Intra-project effects occur when a resource, receptor or group of receptors are potentially affected by more than one source of direct environmental impact resulting from the same development. Inter-project effects occur when a resource, receptor or group of receptors are potentially affected by more than one development at the same time.

During construction, there is the potential for the project to have more than one combined effect on protected lanes (due to an increase in traffic, changes to accesses, and noise and vibration generated by construction activities); the local economy and tourist industry (due to temporary loss of access to green spaces, temporary road closures and diversions, and impacts to public rights of way); and local residents (due to an increase in traffic, and dust, noise and light spill close to construction working areas). No potential significant cumulative effects from the project on a receptor have been identified during operation.

During construction, there is the potential for the project to have combined effects with other proposed developments. This could be on traffic and transport (due to the combination of construction vehicles on the local road network); on views and setting (due to more than one development within the landscape); on recreational amenity (due to potential disruption associated with traffic, noise and visual impacts from more than one development) and on tourist bed space (due to potential increase in workers).

There is the potential for significant cumulative effects during operation from the project and other proposed developments on landscape, views and setting, where the combination of the project and other proposed developments could lead to an increase in the number of buildings and structures within the landscape.

We will identify and set out measures to avoid, prevent, reduce or offset any potential significant cumulative effects in the Environmental Statement. Some of these measures may require collaboration and co-operation with third parties.

Statutory consultation - January to March 2022

Since the close of our non-statutory consultation last year, we have been considering your feedback and continuing to develop detailed proposals.

The feedback has helped to shape and guide the development of the proposals. As a result of feedback, we have made some changes to our plans.

Alongside these changes, we now have more detailed information to present on a number of topics, such as the draft Order Limits, how we would mitigate the impacts of the project on the environment and how we would manage construction traffic.

We would value your thoughts and views to help us as we finalise our plans. We will carefully consider all responses and take feedback into consideration as we do this.

You can find out how to get involved in the consultation in the Have your say (Chapter 16) section.

We have the following documents available. These are all shown online on our project website. If you would like a paper copy of any of our consultation documents or technical documents, then please do get in touch. Please note that technical documents may be subject to a printing change of up to £220.

Document Number	Document Name
1.1	Project Background Document
1.2	Newsletter
1.3	Feedback Form
1.4	Consultation Banners
1.5	Visualisations – Photomontages
2.1	Preliminary Environmental Information Report – Main Document
2.2	Preliminary Environmental Information Report – Appendices
2.3	Preliminary Environmental Information Report – Figures
3	Guide to Interacting with Our Consultation Plans
3.1	Location Plan
3.2	General Arrangement Plan
3.3.1a	Typical Design and Layout Plans: Grid Supply Point Substation Layout
3.3.1b	Typical Design and Layout Plans: Grid Supply Point Substation Elevations
3.3.1c	Typical Design and Layout Plans: Grid Supply Point Substation Single Circuit Cable Sealing End Compound
3.3.1d	Typical Design and Layout Plans: Grid Supply Point Substation 400 kV Temporary Overhead Line Diversion
3.3.2	Typical Design and Layout Plans: Dedham Vale East Cable Sealing End Compound
3.3.3	Typical Design and Layout Plans: Dedham Vale West Cable Sealing End Compound
3.3.4	Typical Design and Layout Plans: Stour Valley East Cable Sealing End Compound
3.3.5	Typical Design and Layout Plans: Stour Valley West Cable Sealing End Compound
3.3.6	Typical Design and Layout Plans: Cable Working Cross Section
3.3.7	Typical Design and Layout Plans: Pylon Design
3.3.8	Typical Design and Layout Plans: Pylon Working Area
3.3.9	Typical Design and Layout Plans: Bellmouth
4.1	Project Development Options Report
4.2	Non-Statutory Consultation Report
4.3	Statement of Community Consultation

Next steps

We will review all responses to our consultation as we finalise the designs for the Bramford to Twinstead reinforcement and prepare our submission documents, including the Environmental Statement, which will set out the likely effects of the project.

Once all documents have been prepared, we will submit an application to the Planning Inspectorate, seeking development consent for the reinforcement and associated development and including other statutory powers to facilitate, amongst other things, the compulsory purchase of land and rights.

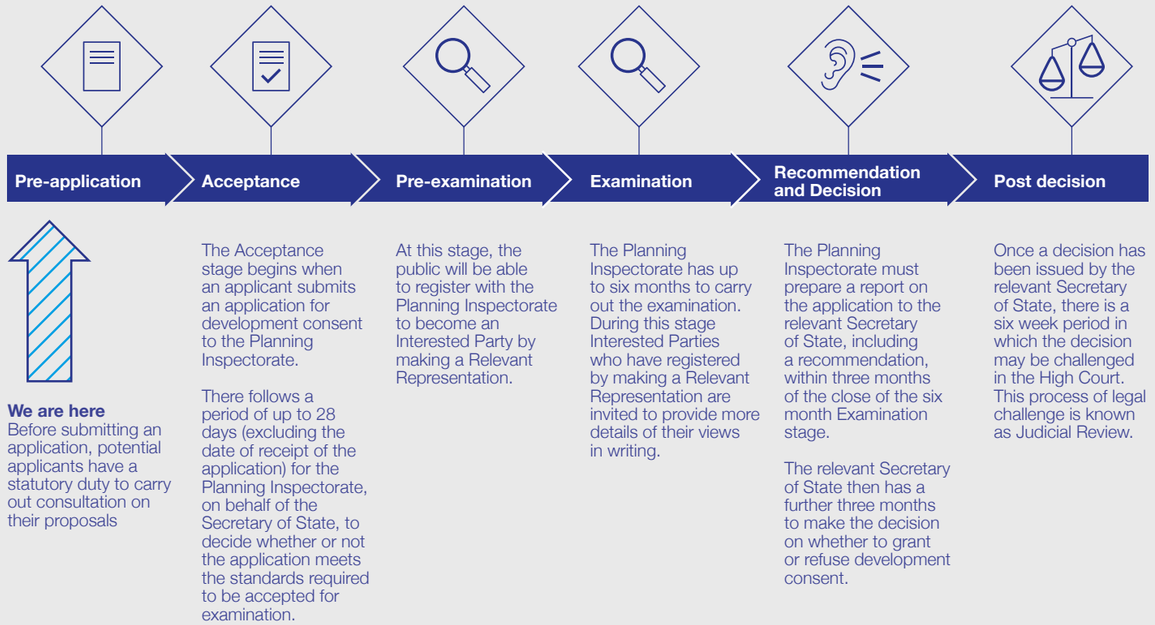
The Planning Inspectorate, on behalf of the Secretary of State, will decide whether the application meets the standards required to be formally accepted for examination. If the application is accepted, the Examining Authority, a group of independently appointed inspectors, will have six months to examine the proposal, listening to the views of Interested Parties and other relevant stakeholders through submission of evidence and through public hearings.

The Examining Authority will then prepare a report on the application to the Secretary of State for Business, Energy & Industrial Strategy, including a recommendation, within three months of examination closing. The Secretary of State then has a further three months to decide on whether to grant or refuse development consent.

A summary of the overall project timeline can be found on the next page:

Spring 2021		Non-Statutory Consultation
Submission of Scoping Report		Summer 2021
Summer/Autumn 2021		Review responses, undertake surveys and update designs
Preparation of Statutory Consultation material including Preliminary Environment Report		Autumn/Winter 2021
Spring 2022		Statutory Consultation
Review responses and update designs		Summer 2022
Autumn 2022		Preparation of application documents including Environmental Statement
Development Consent Order application submission		Winter 2022/2023
Autumn 2024[33]		Start construction if planning consent secured
Construction complete		Autumn 2028

[33] Should planning permission be granted for the GSP substation, construction may start earlier



Further details on the development consent process can be found on the Planning Inspectorate website at **infrastructure.planninginspectorate.gov.uk/**

As mentioned earlier in this document, the GSP substation will form part of the DCO application and is taken into account in the Preliminary Environmental Information (PEI) Report. However, we are also considering the option of applying for planning permission for the GSP substation under the Town and Country Planning Act, in advance of submission of an application for development consent. All feedback received during this consultation will help inform an application made under the Town and Country Planning Act.

Have your say

The aim of our statutory consultation is to:

- update you on our developed proposals for the Bramford to Twinstead reinforcement
- provide you with more detailed information on various topics, such as the specific route alignment
- explain how we have considered feedback from our last round of consultation
- hear your views on our current proposals.

Our consultation is running until 21 March 2022. We want to hear the views of local people. Knowing what matters to you, matters to us, so please get in touch and provide your feedback.

You can take part in the consultation and provide feedback in a range of ways. Full details of all our consultation events and where to find more information will be published in our consultation newsletter, SoCC and on the project website, as set out below.

All information will be readily accessible via the project website, **nationalgrid.com/bramford-twinstead** where you can explore the proposals in further detail.

Feedback form

The easiest way to give your feedback is by completing our online feedback form. Alternatively, you can download and print a paper copy of our feedback form by clicking here and posting it back to us at **FREEPOST B TO T REINFORCEMENT**. You can also request that a consultation pack is sent to you in the post by emailing **contact@bramford-twinstead.nationalgrid.com** or calling us on **0808 196 1515**.

Our response to Covid-19

We had intended to hold a number of face-to-face events during our statutory consultation, to enable you to speak directly with members of our project team and hear more about our proposals. However, in light of recent changes in government guidance, including the recommendation to work from home where possible and the exponential rise in Covid-19 cases connected to the new Omicron variant, we have made the difficult decision to move to a digital-first approach to consultation.

As such, we have replaced all planned in-person events with online and telephone-based alternatives, whilst also increasing the provision of those. This decision has not been taken lightly, but the health and safety of the public and our team must take priority.

Despite this, there are still a number of ways for you to find out more about the proposals and engage with our project team, as set out below. We will continually monitor the situation around Coronavirus and government guidance. If restrictions/case numbers ease during our consultation then we will reassess whether in-person events during the latter half of the consultation are possible.

If you or someone you know is unable to access the information, or needs any assistance with the documents, please do get in touch over the phone to receive paper copies of the information, and to book a telephone appointment with the team.

Ask the experts

We will hold a series of telephone surgeries throughout the consultation period, to allow you to speak directly to and ask questions of our project team.

Appointments are bookable via the project website (nationalgrid.com/bramford-twinstead), email or freephone information line throughout the week.

Once you have contacted us and booked a slot for your surgery appointment, you will have the opportunity to discuss the proposals and ask any questions directly to our expert team.

Appointments are available on the following dates/times:

1 February between 9am - 5pm

7 February between 5pm - 8pm

11 February between 3pm - 7pm

14 February between 3pm - 7pm

15 February between 9am - 1pm

22 February between 3pm - 7pm

2 March between 9am - 1pm

10 March between 10am - 3pm

15 March between 9am - 5pm

18 March between 3pm - 7pm

Join our webinars

The project team will be presenting proposals and taking live questions throughout the consultation period through a series of online webinars.

A total of ten webinars will be held on a variety of topics. These range from broad overviews of our proposals to more detailed sessions on individual topics and/or section of the reinforcement.

Please visit our website **nationalgrid.com/bramford-twinstead**, to sign-up for a webinar. The dates, times and topics of these sessions are listed below:

Date	Time	Topic
31 Jan 2022	10am - 11am	Overview of the proposals (BSL interpreter present)
3 Feb 2022	6pm - 7pm	Overview of the proposals
8 Feb 2022	7pm - 8pm	Sections AB (Hintlesham and Chattisham) and C (Brett Valley)
9 Feb 2022	7pm - 8pm	Sections D (Polstead and E (Dedham Vale AONB)
10 Feb 2022	7pm - 8pm	Sections F (Leavenheath and Assington, G (Stour Valley) and H (Grid Supply Point substation)
16 Feb 2022	7pm - 8pm	Construction and environmental impacts
18 Feb 2022	4pm - 5pm	Overview of the proposals
21 Feb 2022	10am - 11am	Sections AB (Hintlesham and Chattisham) and C (Brett Valley)
23 Feb 2022	10am - 11am	Sections D (Polstead and E (Dedham Vale AONB)
24 Feb 2022	10am - 11am	Sections F (Leavenheath and Assington, G (Stour Valley) and H (Grid Supply Point substation)

One recording of each webinar topic will be made available on the project website afterwards for those who require it.

Postal feedback form

We want to ensure the whole community has the opportunity to respond to the consultation, including those who do not have access to the internet.

For anyone who does not have access to our online forms, printed copies of the feedback forms can be requested via our telephone information line. A paper copy of the feedback form and a freepost envelope will then be posted out to you, so you can send your feedback to us free of charge.

Deposit points

Paper copies of the main consultation materials are available to inspect at the below locations throughout the consultation period. Venue opening hours are subject to change and may be impacted by government restrictions related to Covid-19 - please check with the location first.

Location	Opening hours
Hadleigh Library, 29 High Street, Hadleigh, IP7 5AG	Tuesday, Wednesday and Friday: 9am - 5pm Thursday: 9am - 6pm Saturday: 9:30am - 5pm Sunday: 10am - 4pm
Sible Hedingham Library, 169 Swan Street, Sible Hedingham, CO9 3PX	Monday: 9am - 1pm Thursday: 2pm - 7pm Saturday: 9am - 5pm
Sudbury Library , Market Hill, Sudbury, CO10 2EN	Monday, Wednesday, Thursday, Friday, Saturday: 9am - 5pm Tuesday: 9am - 7:30pm Sunday: 10am - 4pm

We are also working with parish councils in and around the area of the proposed reinforcement to make paper copies of the main consultation materials available at local village halls and similar venues.

Find out more

You can also contact us by:
contact@bramford-twinstead.nationalgrid.com
Freephone: 0808 196 1515

Who to contact if you are a landowner or person with interest in land:
If you are a landowner and want to talk to our lands team please call **01452 889000** or email:
bramford-twinstead@brutonknowles.co.uk

You can find out more about land interests by visiting the 'Information for landowners' page on our website.

Who to contact for a media enquiry:
If you are a member of the media and wish to contact the National Grid team, please call **0800 377 7347** (24 hour) or find our Press Contacts here
nationalgrid.com/media-centre/contacts

Who to contact if you would like information or documents in an alternative format?

We are committed to making project information accessible to all users. If you or someone you know needs any information or documents in an alternative format such as large print, Braille or audio tape, get in touch using the above contact details.

National Grid plc
National Grid House
Warwick Technology Park
Gallows Hill
Warwick CV34 6DA
United Kingdom

nationalgrid.com