The Great Grid Upgrade

Sea Link

National Grid Electricity Transmission needs to upgrade the electricity transmission network between Suffolk and Kent to connect new renewable and low-carbon energy to homes and businesses.

We are proposing to build a new 2 gigawatt (GW) high voltage direct current link approximately 145 kilometres long and primarily offshore. This project is known as Sea Link.

Our consultation

We want to hear what you think of our plans to help us develop our proposals before we submit an application for development consent to the Planning Inspectorate.

Our consultation is running from 24 October until 18 December 2023. You can take part in the consultation in the following ways:

- **attend a public information exhibition**
- **book an in person, video or telephone appointment to an 'ask the experts' session**
- **attend a webinar**
- **complete a feedback form** – complete and return a feedback form to us. You can do this online on our website, in person at our public information events, or by sending a paper copy feedback form back to us using our freepost address FREEPOST SEA LINK (no stamp or further address details are required). Please get in touch to request a paper copy of the feedback form.

The deadline for feedback is **23:59 on Monday 18 December 2023.** Postal responses will be accepted until **Tuesday 2 January 2024.**

Scan the QR code here to view our consultation documents on our website.

Who are we?

nationalgrid Group PLC

National Grid Electricity Transmission

Owns and manages the high voltage electricity transmission system in England and Wales.

National Grid Electricity Distribution

Owns and operates the electricity distribution networks for the Midlands, the South West of England and South Wales, with 8m customer connections serving a population of over 18m people.

ESO Electricity System Operator

The ESO is legally separate from the rest of National Grid and ensures that Great Britain has the essential energy it needs by making sure supply meets demand every second of every day.

National Grid Ventures

Operates a mix of energy assets and businesses to help accelerate the development of our clean energy future (such as undersea interconnectors that allow the UK to share energy with other European countries).

What is The Great Grid Upgrade?

As we transition to clean, green energy, we need to build new infrastructure, as well as upgrading the existing grid, to bring this clean, green energy from where it's generated to where it's needed by homes and businesses.

A grid that's fit for the future

Investment close to home

More clean energy for all

Energy security

2022 – 2030

- **October - December 2022** – Non-statutory consultation
- **September - October 2023** – Pre-consultation stakeholder briefings
- **Spring 2024** – Update stakeholders
- **Autumn 2024 – Autumn 2025** – Pre-examination, examination and reporting
- **2026 – 2030** – Construction
- **October 2022** – Environmental impact assessment scoping submitted to the Planning Inspectorate
- **October - December 2023** – Statutory consultation
- **We are here**
- **Autumn 2024** – Submission of development consent order application
- **Winter 2026** – Secretary of State decision

In the community

Grid for Good

Grid for Good is our flagship programme that helps increase access to training and employment opportunities for young people. We support students with career coaching and masterclasses.

We've reached over 300 students from four schools across Norfolk, Suffolk and Essex already this year, with more activities to come.

Building the net zero energy workforce

To help achieve net zero by 2050, we discovered that our industry needs to recruit 400,000 jobs between now and 2050.

Find out more about careers, apprenticeships and student placements with National Grid:

University engineering challenge

We are teaming up with our charity partner Generating Genius to run a programme with local universities and progressing MSc research with the University of East Anglia.

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Why we need to build Sea Link

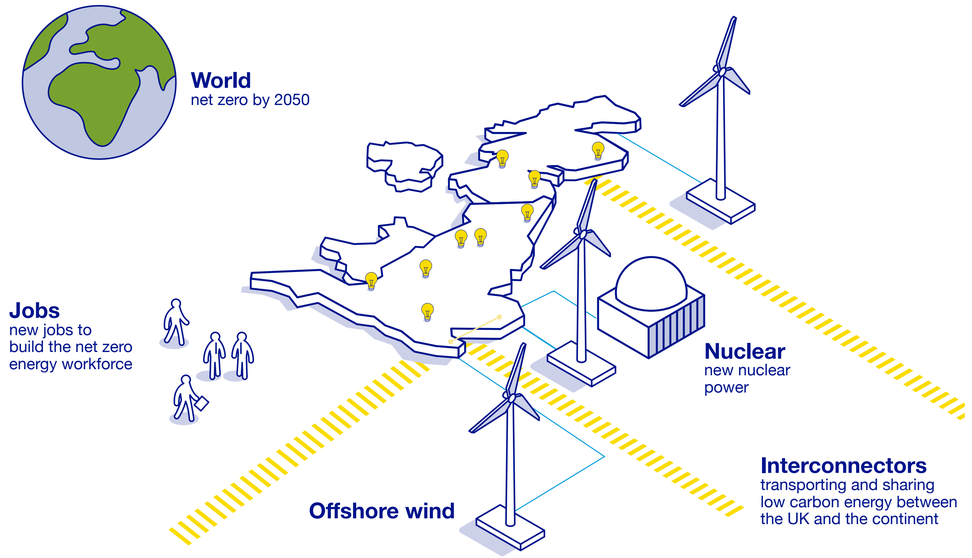
Sea Link would help make sure the grid is ready to transport more secure, cheaper, and cleaner forms of energy and forms part of The Great Grid Upgrade, the largest overhaul of the grid in generations.

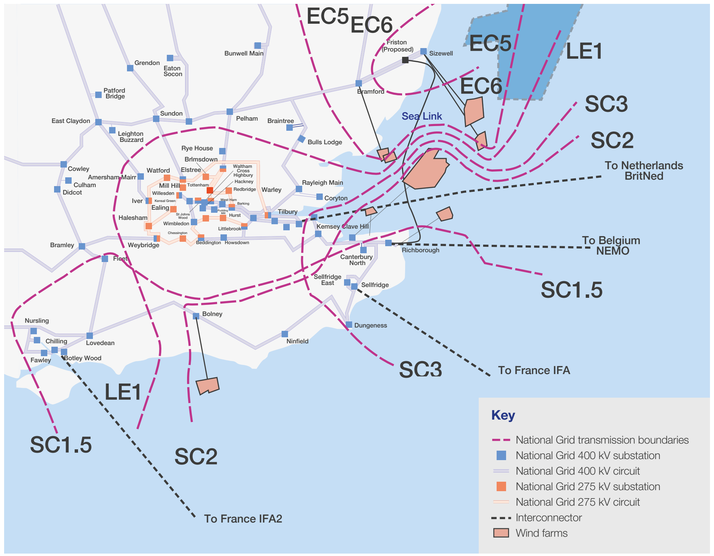
net zero - the UK has set a goal to reach net zero by 2050. To reach net zero we are generating or sharing more low-carbon electricity through offshore wind, nuclear power and interconnectors

how we generate energy is changing - the existing electricity transmission network was not designed to transport electricity from where we increasingly generate it (largely offshore). This means more electricity will be generated in the years ahead than the current network is able to securely and reliably transport

demand is increasing - as a country, electricity demand is forecasted to at least double by 2050, increasing the amount of energy we need to transport to homes and businesses

small scale network change isn't enough - upgrading the existing network as it is today through replacing cables to carry more power etc. will not be enough to carry the amount of future power whilst operating to required standards.





How Sea Link would help to reinforce the network

1. Sea Link would connect new planned generation behind the network boundaries allowing power to be transferred
2. by connecting into the proposed Friston substation, Sea Link would reinforce the Bramford-Sizewell circuits transferring power between transmission boundaries EC5 and the Sizewell Generation Group (EC6 on the adjacent map)
3. connecting into the Kent coast would increase the amount of power that can be transported to and from the south-east, helping to meet domestic demand and imports and exports via interconnectors.

The network today

The network in East Anglia was built in the 1960s and although it can accommodate the level of generation and demand today, this situation will change with the growth of offshore wind, interconnectors and nuclear power.

This means that the amount of power connecting behind the network boundary (referred to as EC5) is far greater than the ability of the network to transport power out of the region.

In the south-east there are several network boundaries where power flows from the north and west of England and across London into Kent. Power flows across boundary LE1 are set to increase as electricity demand is set to grow and along with new interconnectors.

Identifying where the network needs reinforcing

We use the concept of network boundaries to understand network capacity. Where power flows will be higher than 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 and compensate them for the shortfall
2. increase the capability of the network to allow more electricity to flow.

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Our proposals in Suffolk

Based on feedback, further assessments and surveys we have refined our proposals and reduced the number of landfall locations from two to one and reduced the number of converter station sites from two to one.

As a result, the onshore cable corridor options have reduced from five to one and the offshore cable corridor options from two to one.

1 Proposed Friston substation

The proposed Friston substation would be located immediately to the north of the village of Friston. It would be constructed using gas insulated switchgear technology with a footprint of up to 16,800 square meters.

Modification works would be needed to the adjacent 400 kV overhead line.

Scottish Power Renewables has consent to build the proposed Friston substation, but we are also including it in our proposals for Sea Link, to give us a comprehensive consenting position.

2 High voltage alternating current (HVAC cables)

From the substation, there would be a stretch of HVAC underground cables running northwest, south of the B1119 and north of the B1121, towards the proposed converter station (point 3). The HVAC cable stretch would be approximately 1.7 km in length.

3 Converter station

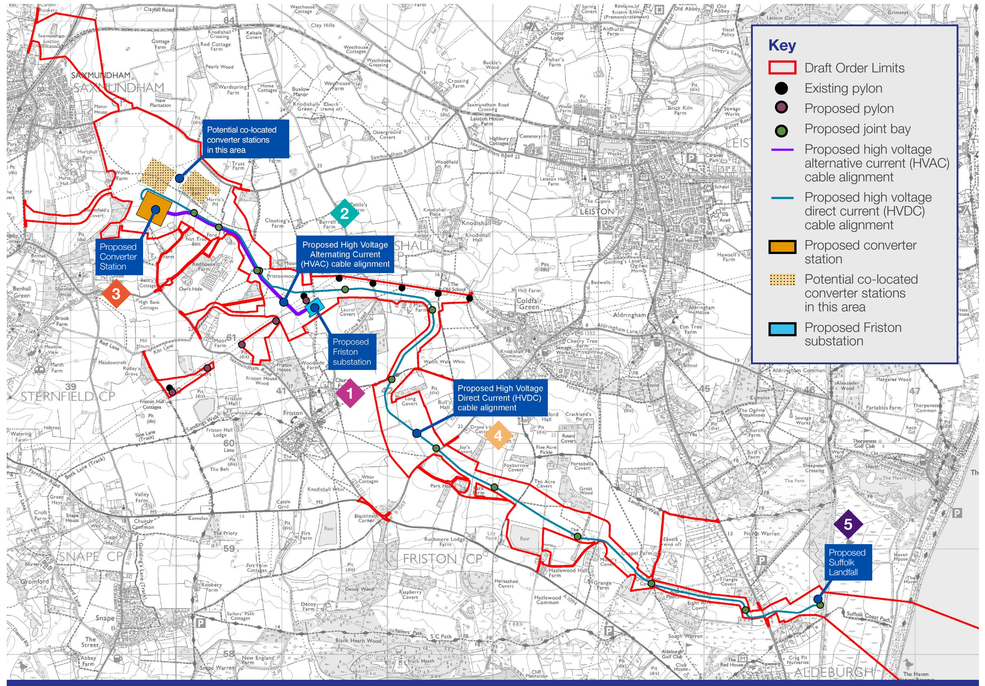
HVAC cables would run into the proposed converter station site located to the east of Saxmundham, and to the south of the B1119.

Converter stations convert alternating current which transmits power into homes and businesses, into direct current which transports power over longer distances, and vice versa.

The converter station would be up to 26 metres in height plus roof mounted equipment (aerials, walkways etc.). Although we would only need one converter station for Sea Link, we are showing illustrative examples of how up to three projects could potentially coordinate with each other and co-locate within the same site.

4 High voltage direct current (HVDC cables)

HVDC cables would run east for approximately 10 km between the proposed converter station and a transition joint bay at the proposed landfall point.



- **a connection from the existing transmission network via the proposed Friston substation, including the substation itself**
- **a high voltage alternating current underground cable of approximately 1.7 km in length between the proposed Friston substation and a proposed converter station**
- **a 2 GW high voltage direct current (HVDC) converter station up to 26 metres high plus external equipment near Saxmundham**
- **a HVDC underground cable connection of approximately 10 km in length between the proposed converter station near Saxmundham, and a transition joint bay where the cable transitions from onshore to offshore technology**
- **a landfall on the Suffolk coast (between Aldeburgh and Thorpeness).**

5 Landfall

A transition joint bay would be needed to transition onshore cables to offshore. This would be located between Aldeburgh and Thorpeness.

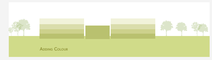
Converter station design

We would also like to hear your views on the design approaches for the converter station that we could explore once we enter the more detailed design stages.

The following illustrations show some possible design principles that may work at the proposed converter station site, based on an initial architectural review:

Enhanced elevations

Colour



Green roof

Agricultural barns

Colour & curve

Kinetic

Coordination and co-location

Our proposals in Suffolk have been developed for Sea Link as a standalone project, but also include opportunities to co-locate infrastructure for up to two further projects (LionLink and Nautilus) being developed by National Grid Ventures. We are showing enough space for co-location in the following areas:

- the converter station site at Saxmundham
- the high voltage direct current and high voltage alternating current cable corridors
- the landfall location.

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Our proposals in Kent

Our proposals in Kent have been developed through feedback, further assessments and ongoing surveys.

1 Landfall

The proposed landfall is located at Pegwell Bay, to the south of Cliffsend. A transition joint bay is needed to transition offshore cables to onshore.

2 High voltage direct current (HVDC cables)

From the transition joint bay, the HVDC cable passes under the A256/Richborough Way and continues west for around 2 km towards the proposed substation.

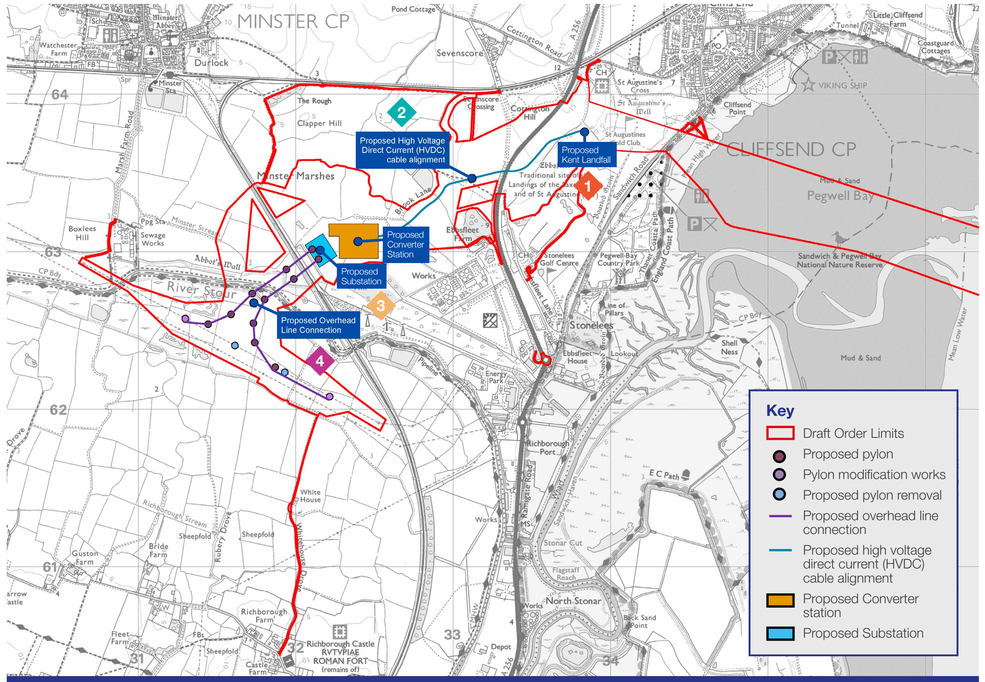
3 Substation and converter station

The proposed 400 kV substation and converter station would be located to the north of Richborough Energy Park in Minster.

Converter stations convert alternating current which transmits power into homes and businesses, into direct current which transports power over longer distances and vice versa.

The converter station would be up to 26 metres in height plus roof mounted equipment (aerials, walkways etc.).

Haul road



- **a landfall point on the Kent coast at Pegwell Bay**
- **a transition joint bay to transition from offshore high voltage direct cable (HVDC) to onshore HVDC cable, before continuing underground for approximately 2 km to a proposed new converter station (below)**
- **a new substation immediately adjacent to a converter station**
- **a 2 gigawatt (GW) HVDC converter station, up to 26 m high plus external equipment (such as lightning protection & railings for walkways), near Minster**
- **removal of up to 1 km of existing high voltage alternating current (HVAC) overhead line, and installation of approximately 2.25 km of new HVAC overhead line from the converter station and substation near Minster and the existing Richborough to Canterbury overhead line.**

4 Overhead line connection

We propose to connect the high voltage alternating current (HVAC) from the proposed 400 kV substation at Minster into the existing Richborough to Canterbury 400 kV overhead line through approximately 2.25 km of new overhead line.

The new overhead line would be routed to the southwest of the proposed converter station and substation site, crossing the River Stour and a section of railway.

Converter station design

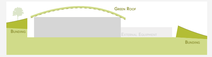
We would also like to hear your views on the design approaches for the converter station that we could explore once we enter the more detailed design stages.

The following illustrations show some possible design principles that may work at the converter station and substation site, based on an initial architectural review:

Enhanced elevations

Colour

Green roof



Agricultural barns

Colour & curve

Kinetic

Underground cables

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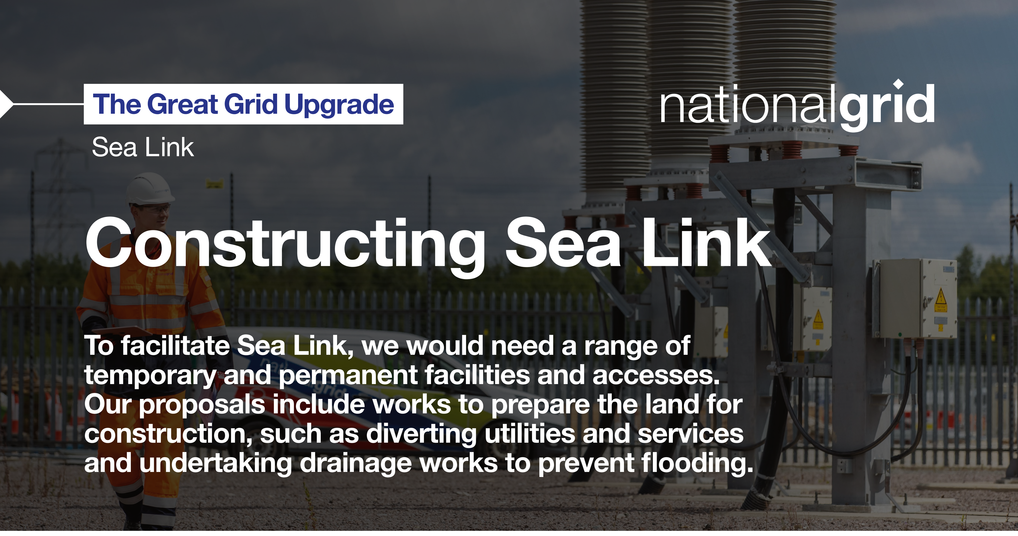
Our marine proposals

Based on feedback, further assessments and surveys we have refined our proposals and reduced the northern marine corridors from two to one because we have removed the alternative northern landfall option at Sizewell in Suffolk.

Approximately 130 km of subsea high voltage direct current cable, running between the Suffolk landfall location (between Aldeburgh and Thorpeness), and the Kent landfall location at Pegwell Bay.



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Constructing Sea Link

To facilitate Sea Link, we would need a range of temporary and permanent facilities and accesses. Our proposals include works to prepare the land for construction, such as diverting utilities and services and undertaking drainage works to prevent flooding.

The construction phase would involve a range of temporary construction activities, including:

- **Working areas for construction**
- **Site offices and storage**
- **Crossing points across watercourses**
- **Construction vehicular accesses and haul roads**
- **Temporary diversions of public rights of way**

Overall, we expect the construction of Sea Link to span from 2026 to 2030.

Some reinstatement and landscaping works would continue into 2031 once Sea Link is operational. We would need to use different types of infrastructure and construction methods in different areas to build and maintain Sea Link:

Construction compounds

To facilitate construction, we are proposing a number of areas that would temporarily store materials, vehicles, staff welfare facilities etc.

Installing underground cables

For the installation of underground cables, a large construction area is required. Additional working areas would be required beyond the construction corridor for site compounds, storage of construction materials and so on.

We would prepare a range of documents to ensure our activities are coordinated and properly planned, these include:

- construction environmental management plan
- construction traffic management plan
- waste management plan
- code of construction practice.

Use of trenchless crossing

We intend to use an underground (trenchless) construction method in some areas to install the cable.

Trenchless crossing techniques allow us to safely install our cable whilst minimising interaction with the land surface, which reduces the impact on wildlife, traffic, and local communities.

Installing subsea cables

Before we install any subsea cables, we undertake surveys of the installation corridor to refine the route.

There are two methods that can be used to install a marine cable. Both methods use a specialist cable installation vessel.

More information about construction methods can be found on the Construction page of our website.

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Landscape, planting and biodiversity net gain

We are committed to leaving behind an enhanced local environment and delivering on biodiversity net gain.

Sea Link also includes opportunities for environmental mitigation, compensation and enhancement. This means we would reduce and avoid impacting the local environment as far as possible. Where this is not possible, we would look to offset the impact of our activities through environmental compensation.

We would like to hear your feedback on how environmental planting and biodiversity net gain could be delivered, and we will consider these as we develop and refine our strategy. This could include delivering planting close to the site that delivers good environmental outcomes, or by partnering with other organisations.

environmental mitigation, compensation and enhancement, such as hedgerow creation, native tree planting or funding local wildlife groups

at least 10% biodiversity net gain.

Preliminary environmental information report

View our Preliminary environmental information report (PEIR) to find out more about Sea Link and the local environment.

Our PEIR considers the likely significant effects of our proposals on the environment, along with the measures we are proposing to mitigate these impacts. The report, along with a non-technical summary of its findings, is available from our project website, **nationalgrid.com/sealink**.

You can find information on environmental and socioeconomic designated sites within the Sea Link boundary on our project website.

We will continue to carry out our environmental impact work to help us prepare our submission. This will consider key topics such as:

- landscape and visual effects
- traffic and transport
- ecology and biodiversity
- heritage.

Throughout this process we will continue to engage with local authorities, listen to local people, and consider the survey results as we identify potential mitigations.