Sea Link

Project background document

October 2022

nationalgrid

This document explains National Grid Electricity Transmission's (NGET) proposals to reinforce the electricity transmission network across Suffolk and Kent.

Our proposals include building an offshore high voltage direct current link between Suffolk and Kent with onshore converter stations and connections back to the national electricity transmission system.

This document has been prepared to support the first stage of public consultation, and the feedback we receive will help us to refine our proposals.

Contents

If you feel your land may be affected by these proposals, please contact the Sea Link land team by calling **01452 889000** or by emailing **SeaLink@dalcourmaclaren.com**

1. Executive summary

This project background document explains our proposals to reinforce the electricity transmission network across Suffolk and Kent. It has been designed to assist stakeholders in responding to our non-statutory consultation, which runs between Monday 24 October and Sunday 18 December 2022.

The UK was the first major economy to pass a net zero emissions law with a 2050 target. The energy industry is playing a key part in this transition, from developing renewable energy generation technology, to upgrading the existing transmission network, which will allow communities across the country to benefit from renewable and low carbon energy.

Helping society to decarbonise is the biggest contribution we can make to the environment, and we at National Grid have a critical role to play in the acceleration towards a cleaner future.

In Great Britain, we are in the middle of a transformation, with the energy we use increasingly coming from cleaner, greener sources. We are making progress, for example, on 25 May 2022 we achieved 19.9 gigawatts (GW) of wind generation on Britain's electricity system, a new wind power record. While recognising that there is more to do, we should be proud of the progress we have made and the fact that Britain is leading the world in many aspects of decarbonising electricity systems. National Grid is at the heart of that energy transformation – investing c.£8 bn on UK Electricity Transmission between 2021/22 and 2025/26, to adapt and develop our transmission network to connect new sources of low carbon and renewable energy to our homes and businesses.

Whilst it is vital that more of the energy we use comes from low carbon and renewable sources, both National Grid and the Government recognise it is also important to keep the impact as low as possible on bills, people, communities and our natural environment. National Grid is committed to finding the right balance between these factors.

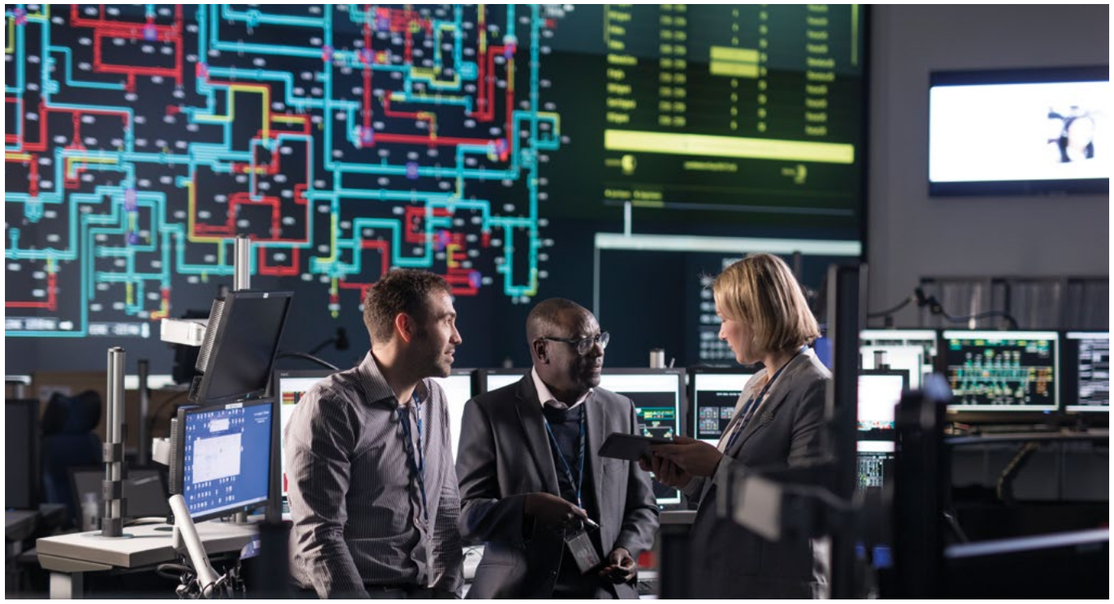
Great Britain already has 11 GW of offshore wind energy in operation, The Government's recent British Energy Security Strategy[1] highlights the ambition to deliver up to 50 GW by 2030.

The proposed Sea Link project will support the UK's net zero target by reinforcing the transmission network across Suffolk and Kent. It will facilitate the connection of new renewable and low carbon energy generation as well as interconnectors.

The reinforcement is needed because our existing national electricity transmission network does not have sufficient capacity for all the new energy we expect to connect to the network over the next eight years and beyond. Sea Link, together with other planned reinforcements, will play a part to enable the energy transition for all.

Our proposal is to build a new 2 GW high voltage direct current underground and offshore electricity link between Suffolk and Kent, including the associated infrastructure needed to support this (such as converter stations, substations and overhead transmission line modifications).

1. British energy security strategy: (Gov UK, April 2022) – Available at gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy



Our public consultation

The Sea Link project will seek to obtain a development consent order (DCO) under procedures governed by the Planning Act 2008. We will submit an application for development consent to the Planning Inspectorate, who will assess it and make a recommendation to the Secretary of State, who will decide on whether a DCO should be granted for the project.

We want to ensure that all stakeholders, including local communities, are engaged in the development of our proposals and have the opportunity to comment on them at key decision making points.

This document sets out information on our plans, what we are consulting upon and how you can get involved. It also signposts to where we are publishing consultation materials.

We are holding a range of both online and in person consultation events and this is your opportunity to comment on the proposals at an early stage of the project's development.

We are holding our first stage of public consultation to introduce the project, explain why additional capability is needed on this part of the network, outline the process that we have been through so far to present our preferred route corridor, and gather public feedback.

It is important that we hear the views of local people so that we can take them into account, where possible, as we develop our plans. Please therefore take time to give us your feedback on these proposals.

The feedback we receive from this consultation, together with information from environmental and technical studies, will inform the next iteration of design.

This is the first stage of consultation on our proposals, and we will carry out further consultation on our project as it develops. We will report all feedback and our responses to your comments in a Consultation Report that will be submitted with our application for development consent.

2. About National Grid

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

It is our vision to be at the heart of a clean, fair and affordable energy future.

We bring energy to life – in the heat, light and power we bring to our customers' homes and businesses; in the way that we support our communities and help them to grow.

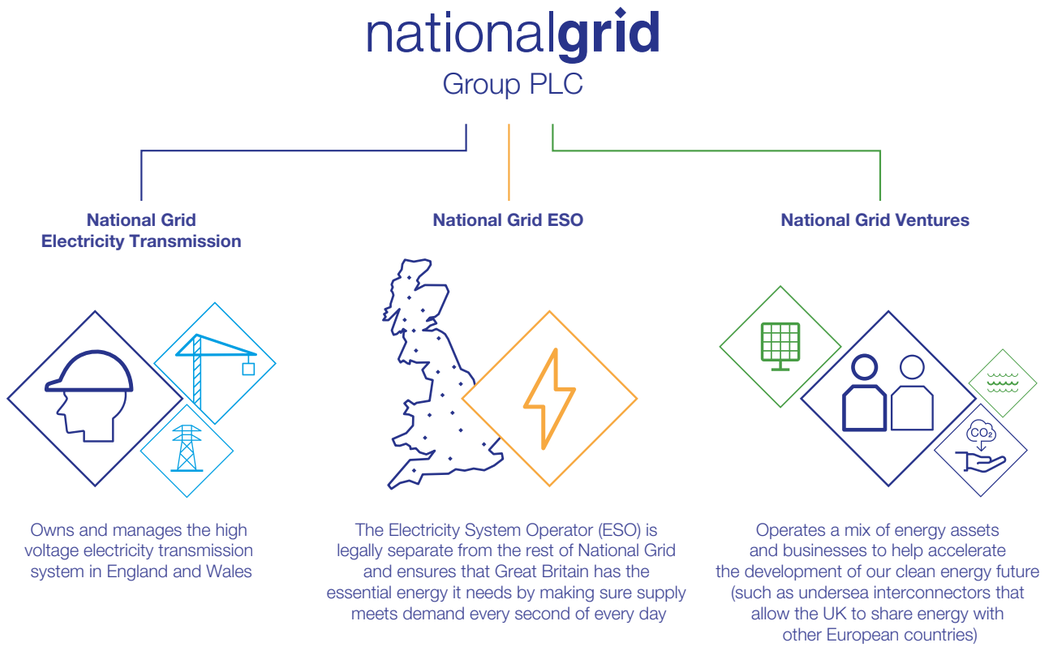
National Grid Electricity Transmission (NGET) owns, builds and maintains the network in England and Wales. It is NGET that is developing plans for the Sea Link project.

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

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.

Our general duties

Under the Electricity Act 1989, National Grid Electricity System Operator (ESO) and NGET 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 achieve this cleaner and fairer future, meet our amenity responsibilities and involve stakeholders and communities is outlined in our commitments when undertaking works in the UK[2]:

- **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
- **involving stakeholders and communities** – we promote genuine and meaningful engagement, meeting and, where appropriate, exceeding the requirements for consultation or engagement
- **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
- **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 particular regard to safety, noise and construction traffic
- **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
- **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
- **enhancing the environment around our works** – when undertaking works, we consider what practical measures can be taken to enhance nearby and surrounding areas for the benefit of local communities and the natural and historic environment
- **monitoring and learning for the future** – we monitor, evaluate and review our engagement processes to learn from previous experiences to improve our working practices
- **reviewing our commitments** – we review these commitments at least every five years, and make additional revisions in response to new legislation, policy and guidance
- **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.

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

3. Moving towards net zero

The world we live in is changing, and the UK is at a turning point as we embrace the opportunities a cleaner, greener future brings. The net zero economy will be underpinned by a clean reliable power system.

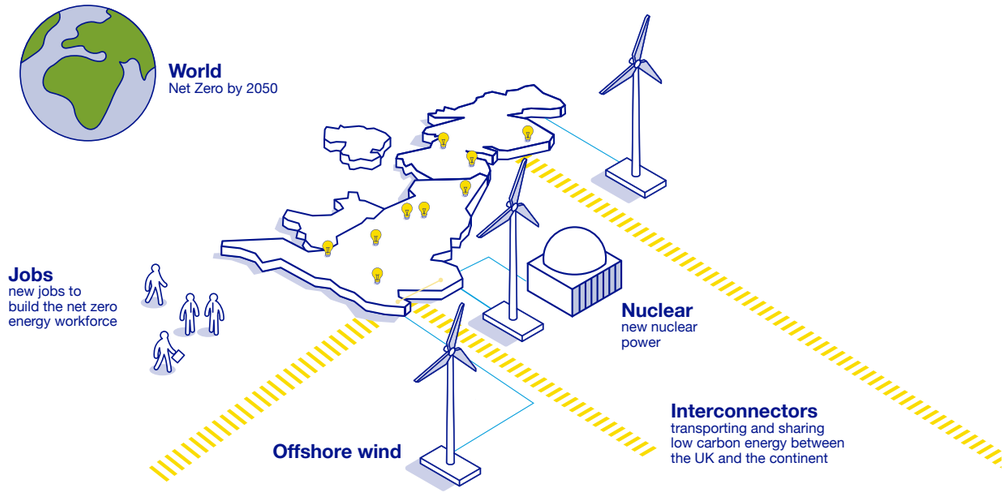
The UK Government has committed to ambitious targets for the country to have up to 50 gigawatts (GW) of offshore wind by 2030, a fully decarbonised power system by 2035, subject to security of supply, on the way to achieving net zero by 2050. At the same time, demand for electricity will increase as we decarbonise other sectors of the economy, such as heating and transport.

As a country we are already making progress. The UK has one of the largest offshore wind capacities in the world, with over 11 GW in operation.

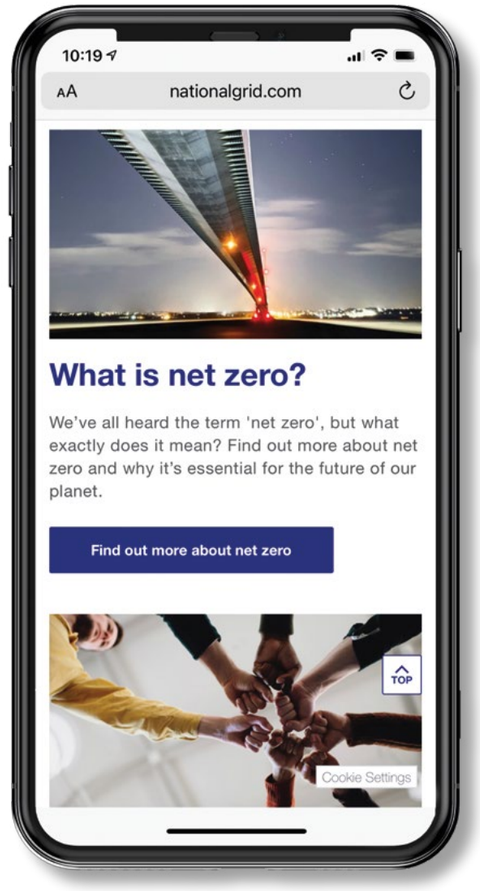
However, more needs to be done. A net zero future for Britain requires significant upgrades to our energy infrastructure to take new renewable and low carbon energy from where it is generated to where it is used.

The new sources of generation are largely set to be located along our coastlines. NGET needs to extend and reinforce the national electricity transmission system – the pylons, cables and substations that transport power around the country – so that we can continue to benefit from secure and reliable energy.

We all want to see the energy we use coming from low carbon and renewable sources. It's also important to keep the impact on the people, places and environments that host our infrastructure as low as possible. As we seek to do this, we will listen to a wide range of stakeholders and communities to help us strike a balance between everything we must take into account.



Find out more about the UK's journey to a net zero future on our website.



4. The project

National Grid Electricity Transmission is proposing to reinforce the electricity transmission network across Suffolk and Kent.

This would be achieved by the construction and operation of a new 2 gigawatt (GW) high voltage direct current (HVDC) link approximately 140 km in length and predominantly offshore. This includes HVDC converter stations and high voltage alternating current (HVAC) connections onto the national electricity transmission system.

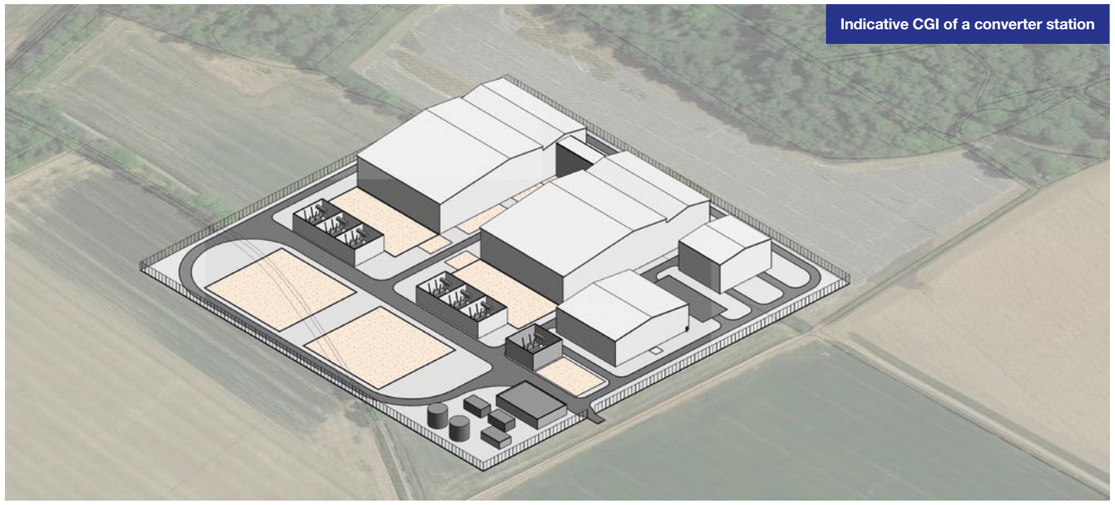
From north to south, the reinforcement would comprise:

- an extension of the proposed substation at Friston to accommodate an extra bay for Sea Link to connect into
- a HVAC underground cable connection between the proposed Friston 400 kV substation and a proposed HVDC converter station (which converts AC to DC, and vice versa). This will also include underground cable joint bays (connecting different sections of underground cables together) along this part of the route
- a new 2 GW HVDC converter station in Suffolk, including essential utility services such as electric, water and drainage
- a HVDC underground cable connection from the HVDC converter station to the transition joint bay up to 1 km from the Suffolk landfall location (where the cable transitions from offshore to onshore). There will also be underground cable joint bays along this part of the route
- a buried subsea HVDC cable between the Suffolk coast and the Kent Coast, approximately 130 km in length
- restringing (replacing the existing conductor for a different type that is able to carry more power) of the Richborough to Canterbury 400 kV overhead line, which is necessary to cater for the increased power flows
- a HVDC underground cable connection from the transition joint bay up to 1 km from the Kent landfall location (where the cable transitions from offshore to onshore) and onto the Kent HVDC converter station location. There will also be underground cable joint bays along this part of the route
- a new 2 GW HVDC converter station in Kent which includes the HVAC substation as well as essential utility services such as electric, water and drainage
- a HVAC connection (either underground cable or overhead line) between the proposed Kent HVDC converter station and the Richborough to Canterbury overhead line.

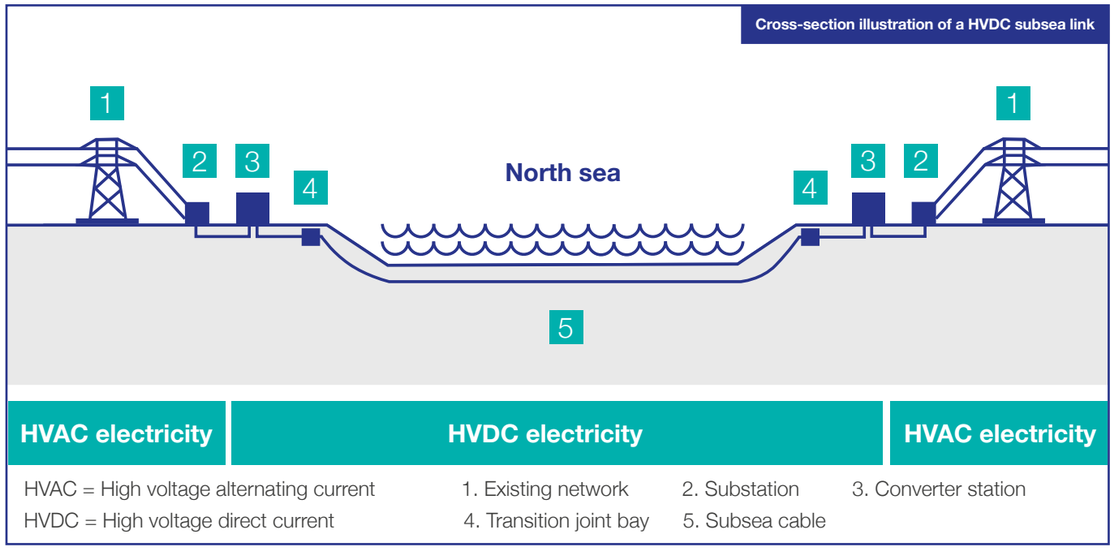
Other elements required to facilitate construction and operation of the project include, but are not limited to, temporary uses of land for construction activities such as working areas for construction equipment and machinery, site offices, welfare, storage, access, and haul roads.

What is a converter station?

Converter stations are the key components of HVDC links. They enable electricity to be converted from alternating current to direct current or vice versa depending on the direction of operation. Converter stations contain specialist electrical equipment; some of this must be located indoors in buildings potentially up to 30 m tall, while some could be located outdoors or in smaller buildings. The total footprint of the converter station is approximately 6 hectares but additional land will be needed during construction.



Indicative CGI of a converter station



5. How the need for network reinforcement is identified

National Grid Electricity System Operator (ESO) leads an annual review which looks at how much energy needs to be transported across the transmission network in the future, and where the capability of the network needs to be improved to make that happen.

The overall effect of that process is to ensure that efficient, coordinated, and economical proposals to reinforce the network are brought forward and progressed at the right time. This enables National Grid to deliver what the country needs from the national electricity transmission system (transmission system), in a way that represents best value for electricity consumers.

National Grid ESO analyses and reports on how the network needs to be reinforced by preparing:

1. **A range of Future Energy Scenarios**[3] (FES) that are discussed with stakeholders and published each summer. These are a credible range of scenarios for how energy will be both produced and consumed up to 2050. FES are used to determine the peak demand and generation capacity regionally.
2. The FES inform the analysis in the **Electricity Ten Year Statement**[4] (ETYS) which is published each November, setting out National Grid ESO's view of future transmission requirements, and importantly, where the capability of the transmission network might need to be reinforced and improved over the next decade.
3. Transmission Owners respond with solutions to address the requirements identified in the ETYS. National Grid ESO assesses and publishes its recommendations as to which proposals should proceed in a **Network Options Assessment**[5] (NOA) report published each spring.
4. National Grid Electricity Transmission (NGET) responds to the NOA recommendations through its **Network Development Policy**[6] which is published each summer. The Network Development Policy sets out which network proposals NGET will take forward.

In planning and operating the network, transmission licence holders, such as NGET, are required by their licence to comply with the National Electricity Transmission Security and Quality of Supply Standard (SQSS). This standard sets out criteria and methodologies for planning and operating the network in Great Britain – in essence, it sets out the minimum requirements for the operation of a secure and stable transmission system.

Sea Link (known as SCD1 in NOA) is a new offshore HVDC link between Suffolk and Kent which provides additional capability across East Anglia, the south east and several boundaries along the south coast. Sea Link has been consistently recommended to 'proceed' through NOA reports since 2019/20. NGET confirmed in 2021 that it will be taking forward work to develop and deliver this reinforcement, as identified in its Network Development Policy statement.

In the recent NOA 2021/22 Refresh (July 2022) SCD1 has been deemed as essential to deliver the Pathway to 2030.

The Network Options Assessment (NOA)

The NOA is an annual report published by National Grid ESO which outlines its recommendations for projects to take forward during the coming year. When a new edition of the NOA is released, NGET will use this to identify where it needs to build new lines and will back check and review the need case for projects that are in progress.

3. Future Energy Scenarios (National Grid ESO, July 2022) - Available at nationalgrideso.com/future-energy/future-energy-scenarios

4. Electricity Ten Year Statement (National Grid ESO, November 2021) - Available at nationalgrideso.com/research-publications/etys

5. Network Options Assessment (National Grid ESO, July 2022) - Available at nationalgrideso.com/research-publications/network-options-assessment-noa

6. Network Development Policy Decisions (National Grid, June 2021) - Available at nationalgrid.com/electricity-transmission/document/137041/download

6. How we develop projects

Our project development process includes the following key stages[7]:

Project development and delivery

1

Strategic proposal

Identify network options to meet need case, undertake strategic options appraisal and select strategic proposal.

2

Options identification and selection

Identify and appraise project options, engage stakeholders and seek consultees' feedback to shape the development of the project.

3

Defined proposal and statutory consultation

Develop project design in response to feedback, identify preliminary environmental information and undertake statutory consultation on the proposal.

4

Assessment and land rights

Refine project design in response to feedback, assess the project impacts and seek voluntary land rights. Prepare the application documents.

5

Application, examination and decision

Submit application, respond to Examining Authority's questions and support through examination hearings.

6

Construction

Discharge Requirements, deliver project, implement reinforcements.

Our project development process includes the following key stages:

We undertake a phased options appraisal and assessment process when developing proposals to reinforce our network.

The options appraisal process has been designed to meet our duties and also follows other relevant policy and guidance when making judgments and decisions on the project. This has included consideration of the relevant National Policy Statements, the Holford Rules (which apply to the routeing and design of overhead lines) and the Horlock Rules (which apply to the location and design of substations). There is no specific guidance regarding routeing of underground and marine cables, but we have applied the principles of the Holford and Horlock Rules where applicable.

Further details on these policies and guidance can be found in Corridor and Preliminary Routeing and Siting Study (CPRSS)[8] report.

We are currently at the options identification and selection stage of the process (step 2, as highlighted on our timeline) and we are seeking feedback during this consultation on our work to date. Your feedback will help to shape our project as we move forward.

The Holford and Horlock Rules

National Grid employs two sets of rules and guidelines for the routeing and siting of new energy transmission infrastructure, which we have applied to this project where relevant:

The Holford Rules[9] provide guidelines for the routeing of high voltage overhead transmission lines. These are important guidelines during the development of a preferred alignment and considerations of whether certain sections should be undergrounded.

The Horlock Rules[10] provide guidelines for, the design and siting of substations and converter stations (in addition to cable sealing end compounds and line entries). When considering new electricity infrastructure, National Grid has regard to the degree to which options comply or deviate from these rules.

7. Our approach to consenting (National Grid, April 2022) - Available at nationalgrid.com/electricity-transmission/document/142336/download

8. Sea Link Corridor Preliminary Routeing and Siting Study National Grid, October 2022) - Available at nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/sealink/document-library

9. The Holford Rules (Lord Holford, 1959) – Available at nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf

10. The Horlock Rules (National Grid, 2009) – Available at nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf

7. The need for reinforcement in East Anglia and the South East

To keep global warming to no more than 1.5°C above pre-industrial levels, avert the worst impacts of climate change and preserve a liveable planet, the world needs to halve emissions over the next decade and reach net zero carbon emissions by the middle of the century.

As part of the Paris Agreement, a legally binding treaty on climate change adopted at COP21 in Paris in December 2015, countries agreed to communicate or update their emissions reduction targets - their Nationally Determined Contribution - every five years to reflect their progression over time. These targets set out how far countries plan to reduce emissions across their entire economy and/or in specific sectors.

In June 2019, the UK became the first major economy to pass legislation to end its contribution to global warming and bring all greenhouse gas emissions to net zero by 2050, putting clean growth at the heart of our modern industrial strategy and seizing the economic opportunities that transition to a greener economy creates.

2050 may seem some way in the future but work is underway to ensure we get there in incremental steps. The Climate Change Act introduced carbon budgets for the UK Government, which cap emissions over successive five-year periods.

The Climate Change Committee has developed a 'Balanced Pathway' as the basis for their latest recommended Sixth Carbon Budget[11]. While it is not a prescriptive path that must be followed exactly, it provides a good indication of what needs to be done over the coming years.

Expansion of low carbon energy supplies is identified as a key area for action.

Key targets along the balanced pathway are:

By 2030:

- reduce UK greenhouse gas emissions by at least 68 per cent from 1990 levels
- decrease the amount of carbon produced when electricity is generated, that is the amount of greenhouse gases emitted per unit of electricity produced by c.80 per cent, from 220 gCO2/KWh in 2019 to around 50 gCO2/KWh in 2030
- increased demand for electricity from around 300 terawatt hour (TWh) today to 360 TWh in 2030
- renewables, such as wind and solar accounting for 60 per cent of electricity generation by 2030.

By 2035:

- reduced UK greenhouse gas emissions by at least 78 per cent from 1990 levels
- decrease the amount of carbon produced when electricity is generated by c.95 per cent from 220 gCO2/KWh in 2019 to around 10 gCO2/KWh in 2035
- increased demand for electricity from around 300 TWh today to 460 TWh in 2035
- renewables accounting for 70 per cent of electricity generation by 2035.

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

As we move to decarbonise the United Kingdom to reach net zero by 2050, our reliance on renewable and low carbon forms of electricity generation is growing. Every person in the country who relies on electricity to power their lives, education, work and hobbies is benefiting, and will be doing so in a way that will impact the atmosphere and the climate less and less.

The electricity industry is tackling climate change, security of energy supplies and energy costs simultaneously. This is highlighted in the UK Government's British Energy Security Strategy[1] published in April 2022. Offshore wind energy has an important role to play in delivering this strategy, and a significant step change is required to deliver up to 50 GW of offshore wind energy by 2030, given the current capacity is around 11 GW.

What this means for the national electricity transmission system:

We've explained in the previous chapter how the need for network reinforcement is identified through the annual cycle, and where the latest associated information can be found.

The Future Energy Scenarios sets out credible ways that the UK can achieve net zero by 2050, as well as the UK Government's commitment to a decarbonised electricity system by 2035. Based on extensive stakeholder engagement, research and modelling, each scenario considers how much energy we might need, where it could come from, and how we maintain a system that is reliable.

In short, fossil fuel-based generation is being phased out and will be replaced with renewable and low carbon generation, much of which is planned to be installed along the east coast. This will be coupled with greater consumer demand as other sectors of the economy move away from fossil fuels. This will put significant pressure on the transmission system which will need to be upgraded to cope and ensure reliable supplies are maintained.

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

To help put these values into perspective:

- a watt is a unit of power
- one gigawatt (GW) is 1,000,000,000 (a thousand million) watts
- a typical kettle uses 2,000 watts
- 50 GW of wind generation is enough to power 25 million kettles simultaneously
- today 11 GW of offshore wind can power 5.5 million kettles
- this decade, as a nation, we are going to increase our offshore wind generation by around 4.5 times what it is today.

Multiple significant reinforcements are needed to the transmission system up and down the east coast:

- to facilitate the connection of future sources of renewable and low carbon power generation along the coast, such as offshore wind farms, nuclear power, and interconnectors
- to enable the transport of all this new proposed power from where it is produced to where it is needed, to centres of demand
- to meet security of supply quality standards and ensure we can continue to play our part in connecting millions of people reliably to the energy they need every day.

The network is planned and operated under a set of standards designed to ensure there are no widespread electricity supply interruptions. These standards ensure that, for given operational and fault scenarios:

- the 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.

How do network boundaries work?

Power is generated and consumed in all regions of the UK; however, some regions generate more or consume less than others, and surplus electricity is shared across the country. In addition, surplus power is traded with our European neighbours through electricity interconnectors.

Reliance on interconnectors will increase as a means of balancing the peaks and troughs in our domestic electricity generation, as a growing amount will be intermittent due to it being increasingly weather dependent. For example, when wind generation is high, surplus power will be exported; and when wind generation is low, some of our needs will have to be met through importing power.

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

1. pay electricity generators on one side of the boundary to reduce the energy they produce (and in turn pay generators on the other side of the boundary to compensate for the shortfall). This then reduces the flows of electricity across the boundary. When National Grid ESO pay generators to do this, these are called ‘constraint payments’
2. increase the capability of the network to allow more electricity to flow.

The need for reinforcement in East Anglia

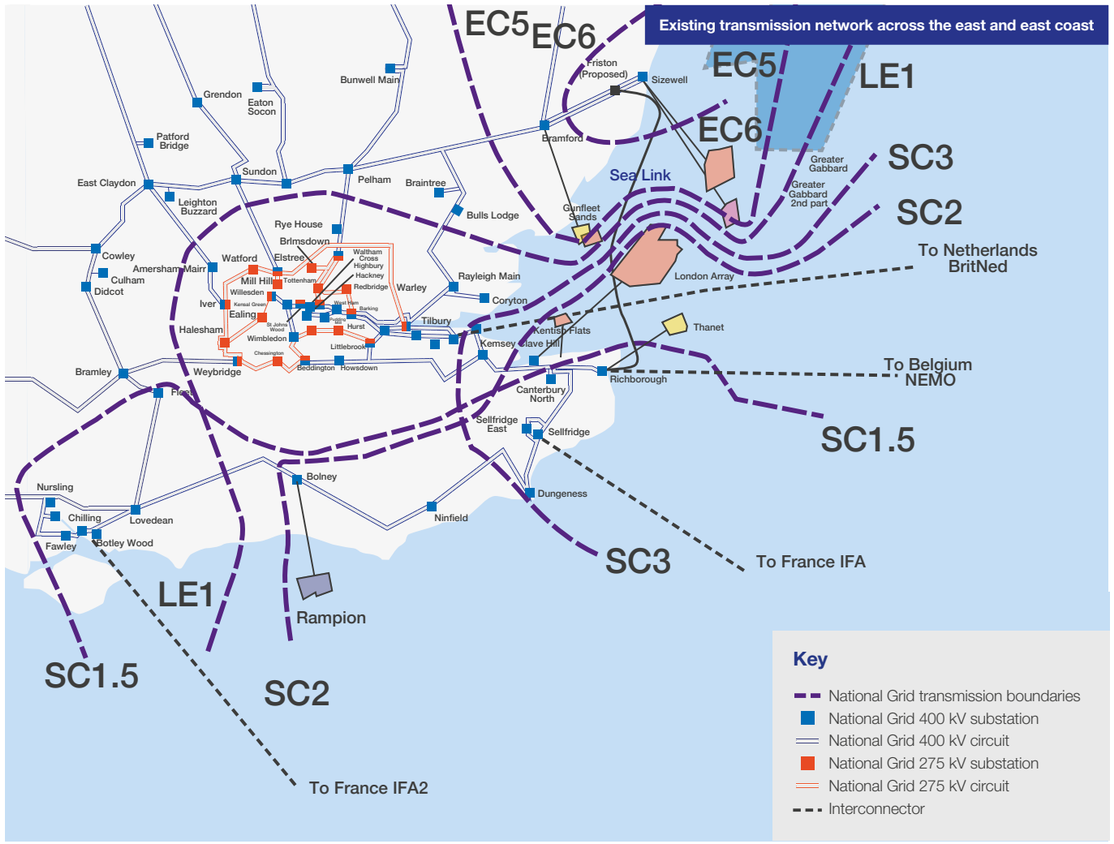
The national electricity transmission system in East Anglia is encompassed by the EC5 boundary.

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. A large loop runs from Walpole in the north of the region to Pelham and Rayleigh/Tilbury in the south, via Norwich and Bramford.

In addition, two 400 kV overhead lines form radial circuits that connect Sizewell B to Bramford substation, these circuits cross boundary EC6. The coastline and relatively shallow waters around East Anglia are attractive for the connection of offshore wind projects, including the large East Anglia Round 3 offshore zone that lies directly to the east. The existing nuclear generation site at Sizewell is one of the approved sites selected for new nuclear generation development. New interconnector projects are also contracted to connect within this area.

The growth in offshore wind, nuclear generation and interconnector capacities connecting behind this boundary greatly increase the power transfer requirements out of the region as local total generation will exceed local demand. The existing high voltage electricity network in East Anglia does not have the capability needed to reliably and securely transport all the energy that will be connected while meeting the Security and Quality of Supply Standard. Several network reinforcement projects are planned to address the shortfall of which Sea Link is one.

In addition to reinforcing the EC5 boundary, by connecting Sea Link into the transmission system at the proposed Friston substation it also reinforces the Bramford-Sizewell radial circuits, which are due to carry additional power from offshore wind, new nuclear and interconnectors, so offering additional constraint savings to the consumer.



The need in the South East

The south of England transmission region includes boundaries LE1, SC1, SC1.5, SC2 and SC3. The LE1 boundary almost exclusively imports power from the north and west of England into the south east.

Power flows in the region are determined by the need to meet domestic demand in the south east as well as imports and exports to Europe via interconnectors.

As more energy is pulled across London and into Kent, power flows across LE1 are set to increase. Demand for electricity will grow; interconnectors will exchange more energy with European countries to help balance intermittent sources of power. As a result, the electricity transmission network in the south east will need to be reinforced to ensure it is able to continue operating safely and securely.

The strategic proposal

The network reinforcement needs identified in both East Anglia and the south east were reviewed together. A single solution which simultaneously dealt with both constraints was selected.

The identified reinforcement that will help achieve this is an offshore 2 GW HVDC link between Suffolk and Kent.

8. Options identification and selection process

In developing our preferred route and sites, we have followed National Grid Electricity Transmission's approach to options appraisal[12] and approach to consenting[7]. Our work is set out in full in our Sea Link corridor and preliminary routeing and siting study (CPRSS[8]) report.

Define the study area

We defined a study area informed by factors including:

- the Sea Link connection end points
- the location of towns and other built-up areas
- the location of physical features such as estuaries
- protected sites such as environmental designations (including Areas of Outstanding Natural Beauty)
- offshore infrastructure and marine activities.

Constraint mapping

We then map out key features in the terrestrial and marine environment that we want to avoid or minimise contact with. These have been informed by planning policy and expert professional judgement. At this stage, we only consider features that would make a difference to our routeing decisions. These include the built-up areas where people live, other infrastructure that is present and features that may be sensitive in terms of ecology, heritage or landscape, as well as features or activities that may represent planning or technical constraints. The full list can be found within our CPRSS report.

Option identification, appraisal and selection

Considering the constraints and opportunities available, using expert professional judgement, we devise and refine various routes from one connection end to another. These seek to represent different high-level options for making the connection, avoiding the identified constraints.

We then carry out an appraisal of each option with engineers, environmental experts and consenting specialists in order to consider the implications of each option. This allows us to compare between options on a consistent basis and on topics that are likely to influence the decision. Through this appraisal we may also identify further options or combinations and do further assessment if required.

We then consider the relative merits of each option to reach our balanced conclusion on a preferred corridor. The decision is informed by National Grid's statutory duties, the options appraisal and planning policy, including Schedule 9 of the Electricity Act 1989 as enshrined within National Grid's commitments when undertaking works in the UK[2].

The options appraisal is a staged process, first identifying options within each geographic study area – Suffolk, marine waters and Kent – appraising each of the options and then identifying an on balance preferred end to end solution.

Landfalls

Landfalls are where the offshore (subsea) cables come ashore and are therefore the interface between the onshore and offshore elements of the project. Potential landfalls were identified based on:

- suitability of ground conditions (e.g. areas of low elevation, avoidance of estuarine habitats)
- consideration of traffic and access opportunities
- avoidance or minimising interaction with existing infrastructure.

Marine route corridors

The primary driver for marine routeing was to identify areas that would ensure long-term integrity and security of the cables whilst minimising environmental and socio-economic impacts. Marine route corridors were developed based on:

- avoiding or minimising lengths of corridors through ecologically sensitive areas, anchorages and areas of archaeological importance
- avoidance of offshore infrastructure
- minimising crossings of other cables and pipelines
- minimising interaction with other marine users, such as shipping and navigation and fishing activities.

Terrestrial corridors

The primary driver for terrestrial routing is to identify the shortest route possible to minimise environmental and socio-economic impact, whilst taking into account constraints such as:

- avoidance of environmental designations where possible
- avoidance of settlements
- consideration of traffic and access opportunities.

12. Our approach to Options Appraisal (National Grid, 2012) – Available at nationalgrid.com/ electricity-transmission/document/96531/download

Converter station sites

Areas of search for potential converter site locations were based on a 5 km radius from the identified connection points. This was to ensure as short as possible high voltage alternating current (HVAC) connection between the converter station and connection point. Sites were identified based on:

- scope for mitigation
- nature of adjacent roads
- proximity to existing areas of woodland (providing screening for converter station infrastructure)
- proximity of adjacent residential properties or listed buildings
- location of public rights of way and cycle routes
- the presence of any potentially valuable landscape elements
- the relative length of high voltage direct current and HVAC connections.

Developing a graduated swathe

Following the selection of a preferred terrestrial corridor, we produced a graduated swathe which indicates where an alignment could be routed. This shaded area is darker where the alignment is more likely to be routed when taking into account the identified constraints but remains indicative only until further assessment work is undertaken. We will consider feedback from public consultation and further information from surveys and stakeholder engagement as we develop the proposal for the alignment.

The marine option does not include a graduated swathe, the dynamic nature of the marine environment means the process for selecting the installation route is largely determined by the environment itself. Following the routeing and siting stage, we have identified a preferred wide corridor (known as the scoping boundary) which will later be refined to the installation route based on survey data and assessments.

9. Identifying our preferred landfall and converter station sites

Routeing and siting considerations are an iterative process, and we need to carefully consider the implications of different combinations when making a balanced overall decision.

To help set out the process we have taken, we have separately described discrete route corridors and siting elements, as follows:

Suffolk

Our study area is between the River Alde in the south, Minsmere in the north and the A12 in the west.

Our emerging preferences

On balance, a landfall between Aldeburgh and Thorpeness has been identified as the emerging preference for Sea Link. This is because it minimises interaction with other infrastructure in the immediate nearshore environment and avoids a nearshore geological feature, the Coralline Crag. The appraisal also identified that this landfall presents opportunities for coordination with other proposed developments.

An alternative landfall, in the proximity of Sizewell nuclear power station has also been identified in Suffolk. Based on the work we have done to date, we believe that landfall in the proximity of Sizewell can only accommodate one set of cables, thereby reducing the opportunity for coordination.

Two converter station sites have been identified as emerging preferences: site 1 which is located to the south of Knodishall and site 3 which is located to the east of Saxmundham.

Both sites are naturally screened by the trees and woodland which surrounds them, and present opportunities to incorporate further mitigation planting into the design of the site. There are also opportunities to minimise the length of the overall onshore cable corridors from the landfall, and for a HVAC connection into the proposed Friston substation.

Kent

Our study area is between Herne Bay on the north Kent coast and Sandwich Bay on the east Kent coast.

Our emerging preference

On balance, we have identified our preference as a route which runs from a landfall in Pegwell Bay to a proposed converter station site north east of the existing National Grid Richborough substation, and a HVAC connection back onto the existing overhead line to the south of Minster. This has sought to minimise the length of the onshore project whilst avoiding an area of challenging seabed on the north Kent coast.

Marine

Our study area runs from the Suffolk coast, in the vicinity of the existing network and the proposed Friston substation; to the Kent coast, in the vicinity of the existing network near the Richborough substation.

Our preferred and alternative options

A marine route corridor between a landfall on the Suffolk coast between Aldeburgh and Thorpeness and a landfall on the Kent coast at Pegwell Bay has been identified as the emerging preference. The marine route corridor emerging preference avoids or minimises interactions with marine designated sites, maintains sufficient water depth at crossings of other cables, whilst also minimising interactions with other marine users as far as possible.

An alternative marine route corridor to the landfall in the proximity of Sizewell nuclear power station has also been identified for the Suffolk section of the marine route corridor.

An example valve hall - IFA2 converter station in Fareham

10. Our proposals

To make it easier to understand our plans, we have broken the route of the project down into various sections, as set out on the following pages.

See section 16 for large versions of our maps.

Our marine proposals

Considerations

We have considered and assessed a number of options for the landfall point and marine route corridor. We have narrowed these options down a single marine route corridor which is approximately 130 km in length, with an emerging preference and alternative landfall option in Suffolk.

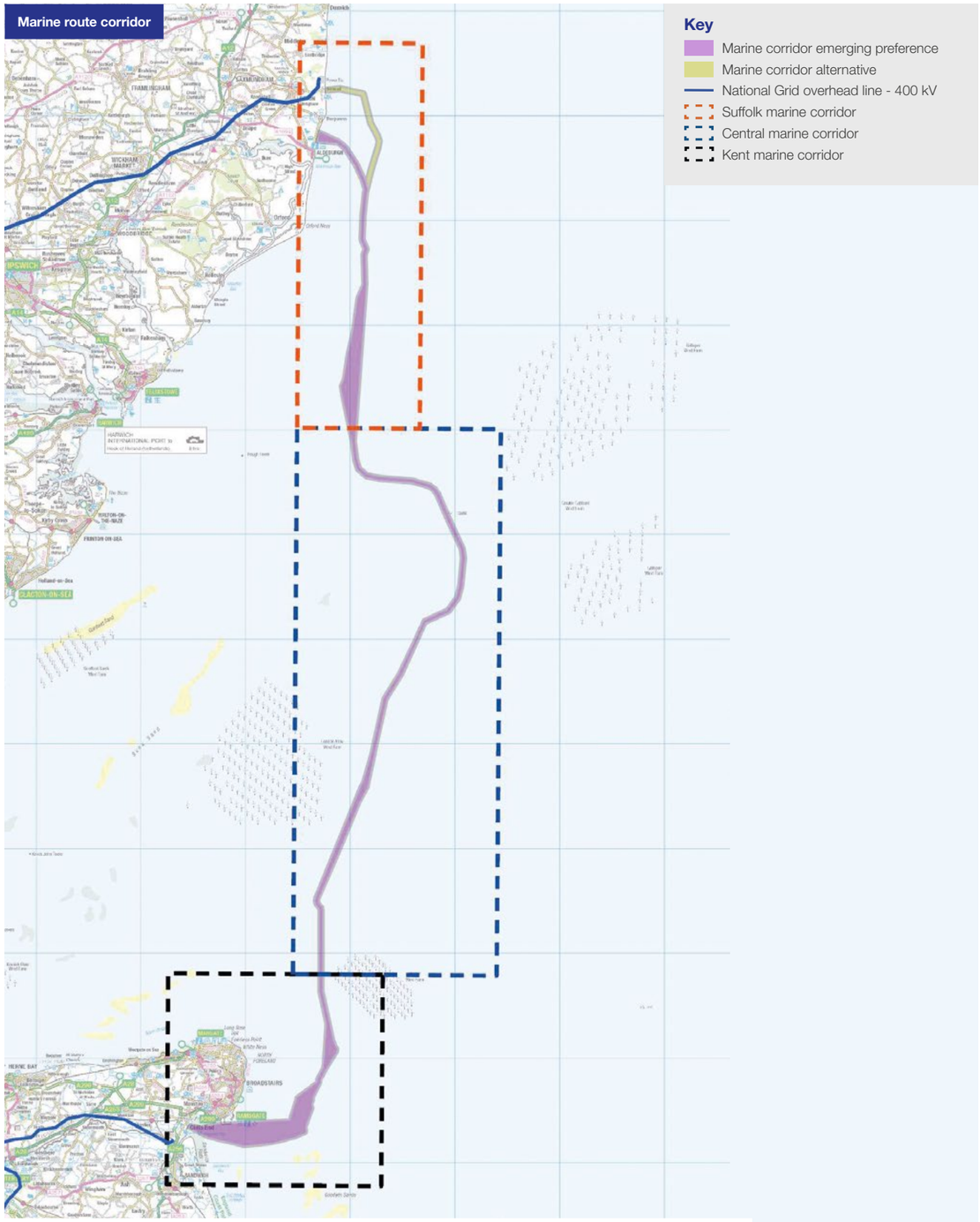
The exact alignment of the cables will be informed by marine surveys and feedback from this consultation.

Marine route corridor emerging preference

From a landfall between Aldeburgh and Thorpeness in Suffolk we would install a subsea cable and associated infrastructure to a landfall at Pegwell Bay in Kent.

Marine route corridor alternative option

From a landfall south of Sizewell nuclear power station in Suffolk we would install a subsea cable and associated infrastructure to a landfall at Pegwell Bay in Kent.



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Our proposals in Suffolk - emerging preferences

Considerations

We have considered and assessed a number of options for the landfall point and converter station.

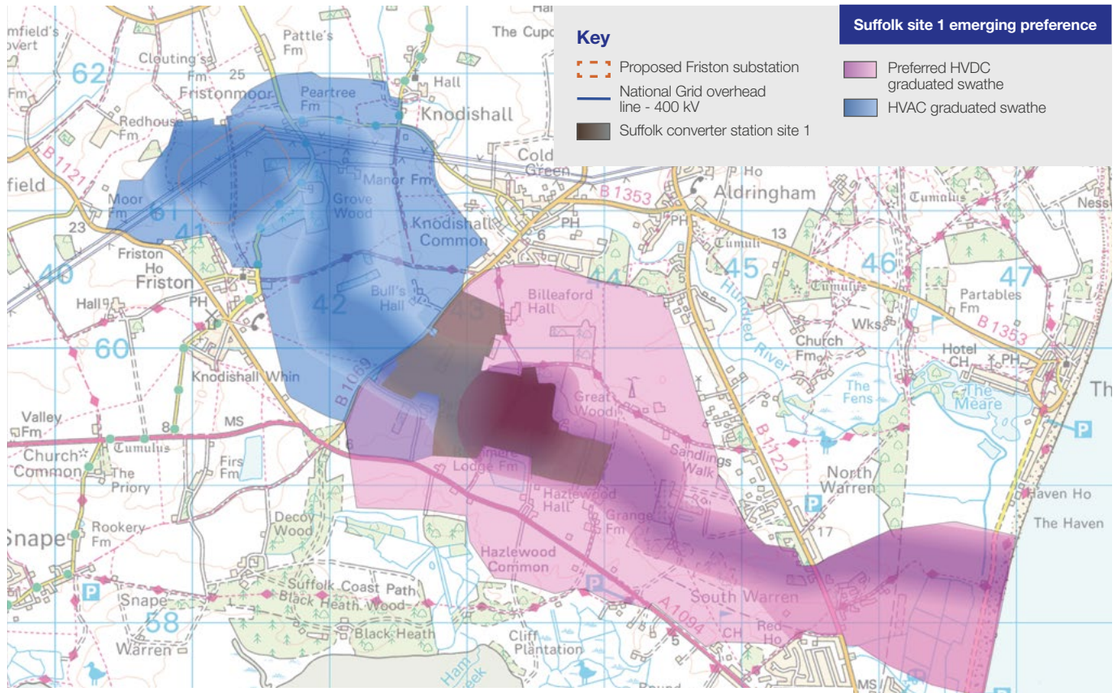
We have narrowed these options down to:

- two different proposed converter station sites
- two marine cable landfall locations
- HVDC cable corridors between the above
- HVAC cable corridors between converter station sites and proposed Friston substation.

In total we are proposing five options for which feedback is sought. These options are split into two categories, emerging preference and alternative option. The two groups cover both proposed converter sites but have their own marine cable landfall location. Our emerging preferences are based on a landfall location between Aldeburgh and Thorpeness whereas the alternative options are based on a landfall location at Sizewell.

From the landfall location, we are proposing to install underground HVDC cables to a new converter station, which will convert electricity from direct to alternating current. We are currently showing two 'search' areas within which we are proposing to locate the converter station but have not yet identified a specific site within the search areas for this infrastructure.

The route of the underground cables into the converter station will depend on which landfall location is chosen. It will also be subject to further design work and technical assessments. Our plans therefore show wide cable route 'corridors' from each landfall option into the converter station 'search area,' and then onwards to the proposed Friston 400 kV HVAC substation. We would not need all of the land within the route corridors to install the underground cables.



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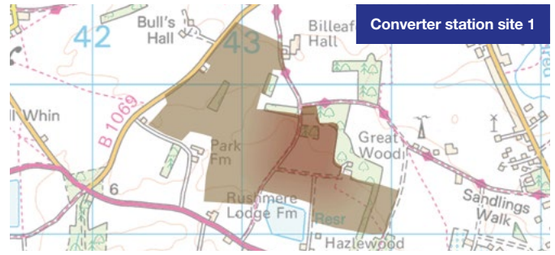
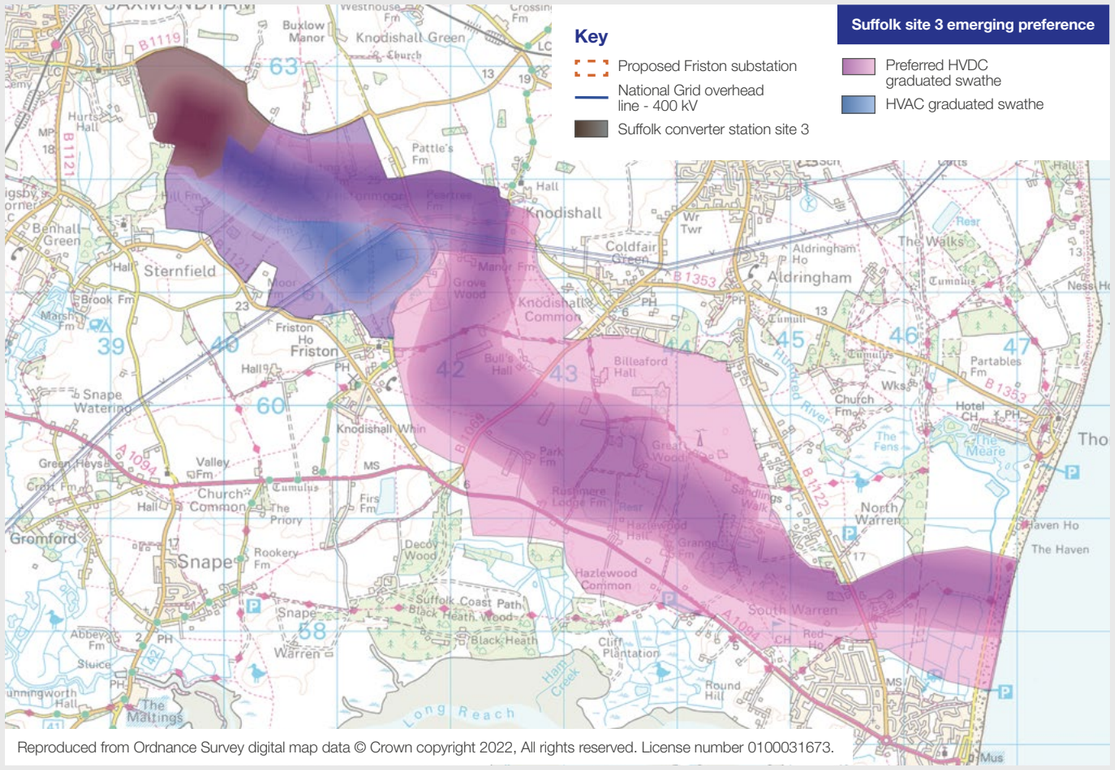
Suffolk site 1 emerging preference

From a landfall location between Aldeburgh and Thorpeness, we would install underground HVDC cables running west (north of the A1094) to the converter station site 1.

We would install HVAC underground cables from the converter station to the north west to connect into the proposed Friston 400 kV HVAC substation.





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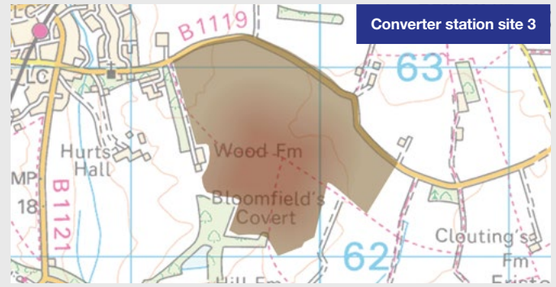
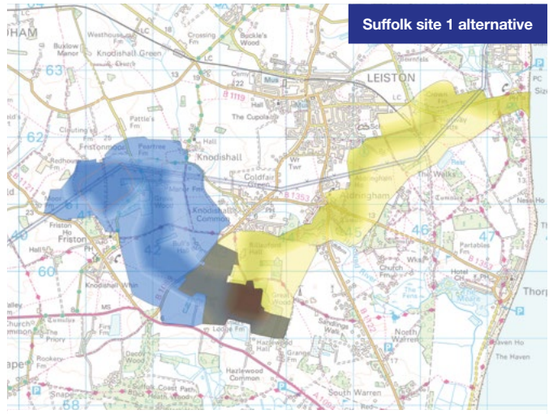
Suffolk site 3 emerging preference

From a landfall location between Aldeburgh and Thorpeness, we would install underground cables running north west (north of the A1094) to the converter station site 3.

We would install HVAC underground cables from the converter station to the south east in order to connect into the proposed Friston 400 kV substation.



Our proposals in Suffolk - alternative options



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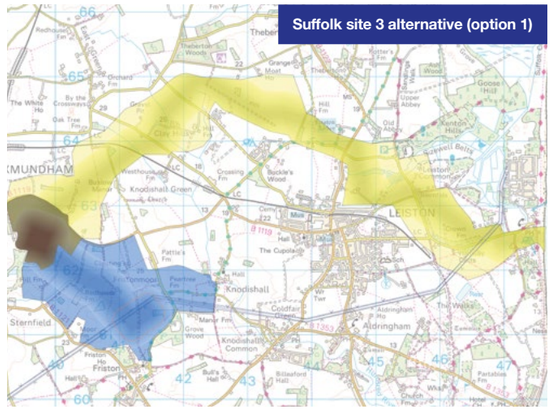
Key

- Proposed Friston substation
- National Grid overhead line - 400 kV
- Suffolk converter station site 1
- HVDC corridor and graduated swathe
- HVAC corridor and graduated swathe

Suffolk site 1 alternative

From a landfall location at Sizewell, we would install underground HVDC cables running south west (past Leiston and Aldringham) to the converter station site 1.

We would install HVAC underground cables from the converter station to the proposed Friston 400 kV HVAC substation.



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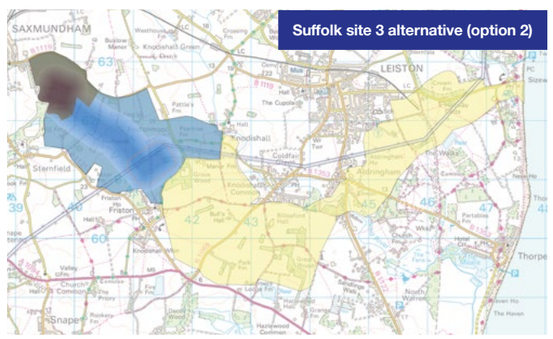
Key

- Proposed Friston substation
- National Grid overhead line - 400 kV
- Suffolk converter station site 3
- HVDC corridor and graduated swathe
- HVAC corridor and graduated swathe

Suffolk site 3 alternative (option 1)

From a landfall location at Sizewell we would install underground HVDC cables running around the north of Leiston to the converter station site 3.

We would install HVAC underground cables from the converter station to the south east in order to connect into the proposed Friston 400 kV HVAC substation.



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Suffolk site 3 alternative (option 2)

From a landfall location at Sizewell, we would install underground HVDC cables running south west (past Leiston and Aldringham) to the converter station site 3.

We would install HVAC underground cables from the converter station to the south east in order to connect into the proposed Friston 400 kV HVAC substation.

Proposed Friston substation

At both ends of Sea Link the HVDC converter stations need to connect into the existing national electricity transmission system. In Suffolk, we are proposing a HVAC underground cable connection to be made into the proposed Friston substation. This substation will need to be extended to allow this Sea Link connection to be made. The extension would include busbars, switchgear, cable sealing ends, civils and associated infrastructure.

Consideration for coordination with National Grid Ventures projects

Alongside National Grid Electricity Transmission's proposals for Sea Link, there are two other HVDC projects being proposed in the Suffolk area by National Grid Ventures, EuroLink and Nautilus.

All the proposed Suffolk specific routeing and siting options defined in this project background document are applicable to Sea Link as a standalone project.

However, subject to further assessment and studies, some of our proposals in Suffolk could potentially accommodate co-location of up to three converter stations with shared HVDC and HVAC cable corridors and shared landfall as follows:

- site 1 and site 3 converter station locations could potentially accommodate up to three converter stations
- the landfall between Aldeburgh and Thorpeness and the cable corridors from here to both site 1 and site 3 could potentially accommodate up to three sets of HVDC cables
- the HVAC cable corridors between site 1 or site 3 converter station locations to the proposed HVAC Friston substation could potentially accommodate the HVAC cables necessary to connect up to three converter stations.

Co-locating infrastructure could contain the spread of impact, whereas separating the proposed infrastructure may reduced the intensity on a single area.

In the feedback section of this consultation, we are seeking your views on potential co-location. Please let us know what you think.

As the project progresses, we will continue to explore opportunities to coordinate at all levels.

Our proposals in Kent

Considerations

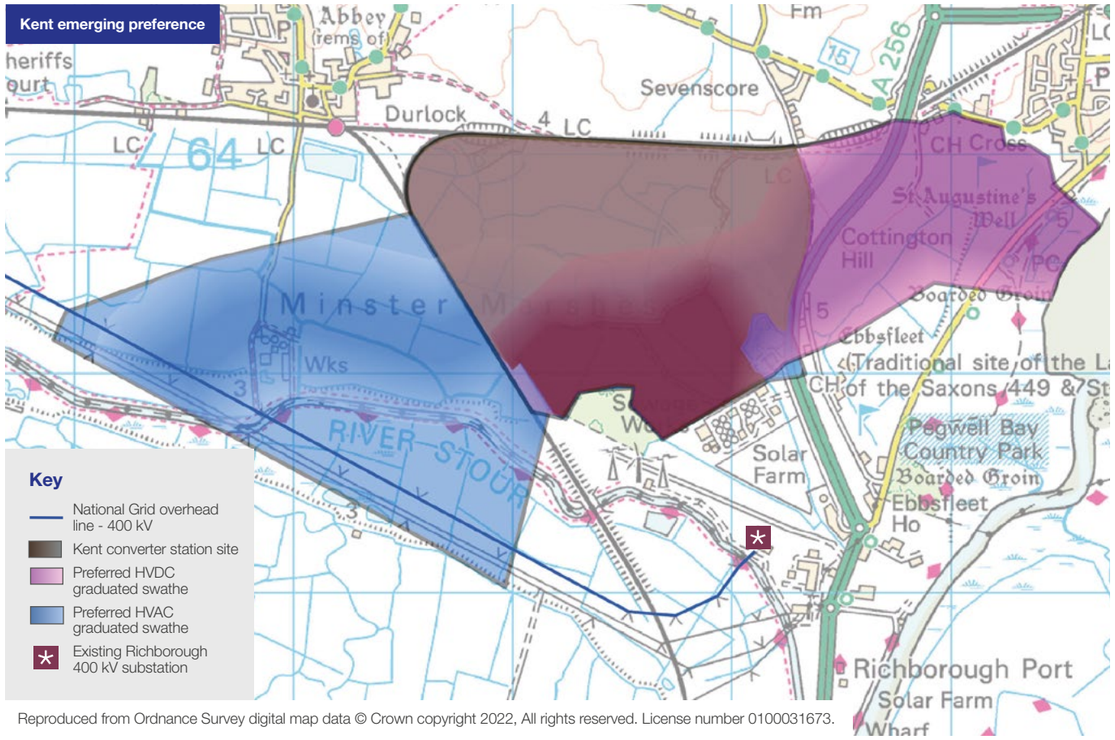
We have considered and assessed a number of options for marine cable landfall locations, converter station sites and interlinking HVDC cable corridors, as well as the HVAC connection between the converter site and the nearby electricity transmission system.

We have narrowed these options down to a single converter station site, for which we have identified preferred route corridors for the HVDC and HVAC connection infrastructure.

The route of the underground cables into the converter station is subject to further design work and technical assessments. Our plans therefore show wide cable route 'corridors' from Pegwell Bay into the converter station 'search area', and then an onward HVAC connection to the Richborough to Canterbury overhead line. We would not need all of the land within the route corridors to install the HVDC cables and HVAC cable or overhead line connections.

Emerging preference

From a landfall (where the link would transition from offshore to onshore) location at Pegwell Bay, we would install underground HVDC cables running west to connect into a new converter station, located within 5 km of the existing Richborough 400 kV substation. A HVAC connection, which could be either underground cable, overhead line or a combination of the two, would be installed between the converter station and a point on the existing Richborough to Canterbury overhead line.



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11. The Business, Energy and Industrial Strategy (BEIS) review of offshore coordination

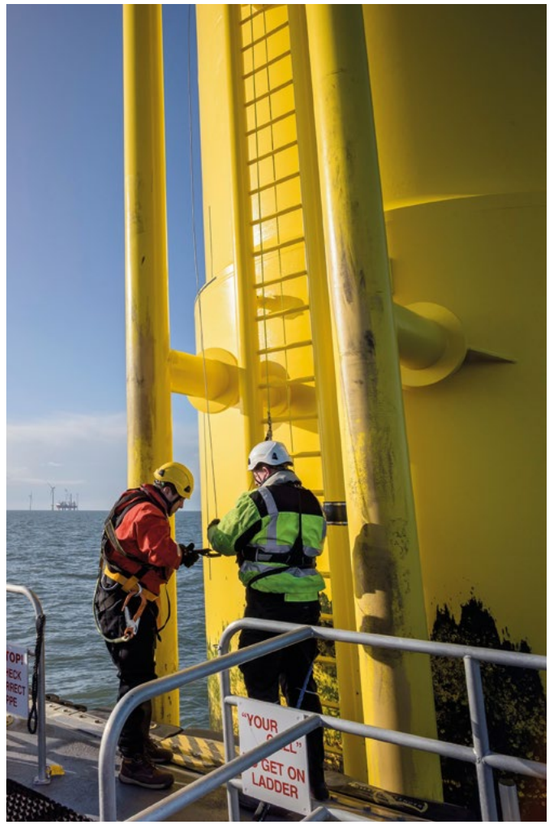
The BEIS department's Offshore Transmission Network Review[13] looks into the way that the offshore transmission network is designed and delivered.

Onshore and offshore energy infrastructure are critical to delivering on the ambition for the UK to be net zero by 2050.

National Grid Electricity Transmission is working together with other developers to explore the potential for offshore coordination with Sea Link, as part of the Offshore Transmission Network Review (OTNR) "Early Opportunities" workstream[14].

Offshore coordination could reduce, but not avoid, the need for new onshore infrastructure and reinforcement of the existing network. The need for Sea Link, its converter stations, and associated infrastructure in Suffolk and Kent, remains regardless of offshore coordination.

We are working with the Government and Ofgem as they continue to progress the changes needed to enable greater offshore coordination.



13. Offshore Transmission Network Review (BEIS) - Available at gov.uk/government/groups/offshore-transmission-network-review

14. Joint Statement from North Falls, Five Estuaries and National Grid (Gov UK, July 2022) - Available at gov.uk/government/publications/offshore-transmission-network-review-pathfinder-projects/joint-statement-from-north-falls-five-estuaries-and-national-grid-commitment-to-exploring-coordinated-network-designs-in-east-anglia

12. Our public consultation

Our commitment to you

As we upgrade the electricity transmission network and develop proposals to allow more energy to flow on our network, we will work with a wide range of stakeholders and experts.

Listening to communities gives us valuable feedback and insight as we develop our proposals and look to minimise any impacts.

Where our plans affect you or your community, we encourage you to let us know your opinions on our proposals.

Your views are important to us and we will carefully consider all feedback we receive. It will help shape our plans as our infrastructure projects develop.

Our approach to public consultation

Certain types of energy infrastructure fall within the classification of nationally significant infrastructure project, which require a development consent order (DCO).

Applications for DCOs are submitted to and examined by the Planning Inspectorate. They are determined by the Secretary of State for Business, Energy and Industrial Strategy, not by a local planning authority, who remain an important consultee in the process.

Consultation to support our DCO application is planned to take place over two stages this year and next. This first stage of public consultation is being held at an early stage of development to introduce the project and ensure we capture the views and knowledge of local people before developing our plans further.

The aim of this consultation is to:

- introduce the project to the public and provide an overview
- explain why we need to build the reinforcement
- set out options that have been considered and how we made the decision on the corridor and graduated swathe being proposed
- present our proposed corridors with graduated swathe
- present our proposed HVDC converter sites
- present our proposed marine route and cable landing locations
- give stakeholders the opportunity to provide feedback on our work to date
- outline next steps.

We are using a blend of both traditional and digital consultation tools to reach the widest possible audience. Information about our proposals and access to the project team will be equally available both online and offline.

We are committed to engaging with all stakeholders and we recognise that some people have particular needs or may not have access to the internet.

Our consultation has been designed to ensure we understand these different needs and are accessible to everyone. If you or anyone you know has difficulty accessing project information or providing feedback, please contact us using the details found in section 14. We want to make our consultation as inclusive as possible, and our community relations team will be pleased to help.

Who are we consulting?

Our consultation is open to anyone who may have an interest in our proposals.

We are consulting with residents, communities, landowners, local businesses and interest groups, as well as elected representatives and prescribed consultees, such as the Environment Agency, Natural England and Historic England.

What information is available?

We have published the materials listed in the table below to provide information on our proposals.

Paper copies of the newsletter and feedback form are available at consultation materials deposit points for collection, see details of these in section 13. The feedback form is also available on our website to complete or download. See section 14 for details on how to give feedback.

What we are asking for feedback on

Throughout this document we have explained the need case for Sea Link and our approach to consenting. We want to know your views on our proposed Sea Link corridors and graduated swathes, the proposed Friston substation and converter stations sites, along with any feedback on coordination with National Grid Ventures' projects.

We also want to know about any concerns or questions you might have about our proposals, or any local factors we should consider. The feedback received through this first consultation stage will inform how we further develop Sea Link.

Available materials	
Project background document	Providing an overview of the project and detailing our proposals and how we are consulting
Corridor preliminary routeing and substation siting report	Providing more information on the project and the need for the project, the options considered, the routeing and siting options assessed
Newsletter	Summarising details of the project and public consultation
Feedback form	Providing you the opportunity to give us your comments and feedback, to inform the next version of design where possible
Website	Hosting all project information, including downloadable versions of the above documents, an online feedback form and interactive map

13. Consultation events and materials

Throughout the consultation we are holding a series of face to face and online events. These events provide the opportunity to present information, and members of the project team will be available to talk through our proposals and answer questions.

Public information events

Please visit our face to face public information events being held at the following locations across the proposed route to find out more and speak to experts within the team.

Public exhibitions in Suffolk		Public exhibitions in Kent	
Location	Date and time	Location	Date and time
Old Generator Station King's Field Aldeburgh IP15 5HY	Thursday 10 November 1pm – 8pm	Guildhall Cattle Market Sandwich CT13 9AH	Thursday 17 November 9am – 4pm
Friston Village Hall Church Road Friston Saxmundham IP17 1PU	Friday 11 November 1pm – 8pm	Newington Community Centre Princess Margaret Avenue Ramsgate CT12 6HX	Friday 18 November 1pm – 8pm
Fromus Centre The Saxmundham Hub Street Farm Road Saxmundham IP17 1AL	Saturday 12 November 10am – 5pm	Cliffsend Village Hall 55 Foads Lane Cliffsend Ramsgate CT12 5JH	Saturday 19 November 10am – 5pm

Website

The project website will host downloadable copies of consultation documents, an online feedback form and interactive map.

Consultation materials deposit points

Paper copies of the main consultation materials are available to inspect at the following locations throughout the consultation period. Venue opening hours are subject to change – please check with the location.

Kent locations
Ash Library, 11 Queen's Rd, Ash, Canterbury, CT3 2BG
Broadstairs Library, the Broadway, Broadstairs, CT10 2BS
Birchington Library, Alpha Road, Birchington, CT7 9EG
Cliftonville Library, Queen Elizabeth Avenue, Margate, CT9 3JX
Deal Town Council, High St, Deal, CT14 6TR
Margate Library, Thanet Gateway Plus, Cecil Street, Margate, CT9 1RE
Minster-in-Thanet Library, 4A Monkton Road, Minster, Ramsgate, CT12 4EA
Newington Library, Marlowe Academy, Marlowe Way, Ramsgate, CT12 6NB
Ramsgate Library, Guildford Lawn, Ramsgate, CT11 9AY
Sandwich Library, 13 Market Street, Sandwich, CT13 9DA
Walmer Town Council, 62 The Strand, Walmer, Deal, CT14 7DP
Westgate Library, Minster Road, Westgate-On-Sea, CT8 8BP

Online webinars

Attend an hour online webinar where we will present details of the proposals followed by an open Q&A. We are holding webinars that provide a general overview of the proposals.

Six project webinars will be held throughout the consultation period at the following dates and times:

Our proposals in Suffolk
Tuesday 22 November, 6pm – 7pm
Tuesday 29 November, 6pm – 7pm

Our proposals in Kent
Wednesday 23 November, 6pm – 7pm
Wednesday 30 November, 6pm – 7pm

Marine route proposals
Thursday 24 November, 6pm – 7pm
Thursday 1 December, 6pm – 7pm

You can register to attend one of our webinars by visiting our website, calling our freephone number or emailing us.

Suffolk locations
Aldeburgh Library, Victoria Rd, Aldeburgh, IP15 5EG
Aldeburgh Town Council, Moot Hall, Market Cross Pl, Aldeburgh, IP15 5DS
Co-op, 117 High Street, Aldeburgh, IP15 5AR
Leiston Library, Old Post Office Square, Main St, Leiston, IP16 4ER
Leiston Town Council, Main St, Leiston, IP16 4ER
Saxmundham Library, Block B, Street Farm Rd, Saxmundham, IP17 1AL
Saxmundham Town Council, Block B, Street Farm Rd, Saxmundham, IP17 1AL

14. Have your say

This section sets out how you can find out more information, and provide your feedback on the project.

Our consultation runs from 24 October to 18 December 2022. You can provide your feedback in the following ways:

Complete a feedback form

We have produced an online feedback form for you to fill in and submit on our website at **nationalgrid.com/sealink**

Paper copies of our feedback form will be available to pick up from our face to face public information events and consultation materials deposit points listed in section 13. You can also download and print a copy of the feedback form from our website; alternatively, please get in touch and we will post one to you.

Send us a letter

You can send a letter/or completed feedback form to **Freepost SEA LINK** (no stamp or further address details are required).

Email us

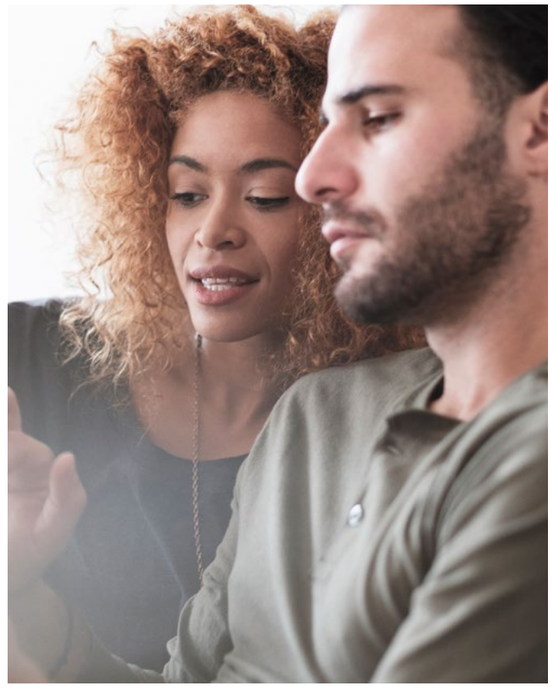
If you prefer to send us your comments via email, you can send them to us at **contact@sealink.nationalgrid.com**

Call us

Freephone 0808 134 9569
(Lines are open Monday to Friday 9am – 5.30pm)

If you would prefer to receive any information relating to the consultation through the post, or you need it in another format, please get in touch.

If you have difficulty writing down your feedback, a member of the team will be able to take comments over the phone.



15. Next steps

The feedback received throughout the first stage of consultation will inform how Sea Link is developed further and will influence the next stage in the design of the project.

Over the coming months we will be in discussions with landowners and people with an interest in land which interacts with the project.

We will carry out environmental impact assessment work and undertake surveys along the route. Further to this we will discuss with local authorities what we need to consider as part of the formal environmental assessments and this will be set out within a scoping document.

The findings of our assessments will be detailed in a preliminary environmental information report which will be presented at the next stage of consultation.

When the non-statutory consultation closes, we will review all the responses as we continue to develop the designs.

Our next stage of consultation is planned for 2023, when we will present more detailed proposals. At that point people will be able to see how we have taken their views into account, and provide further feedback on the project, which will help us further refine the project design.

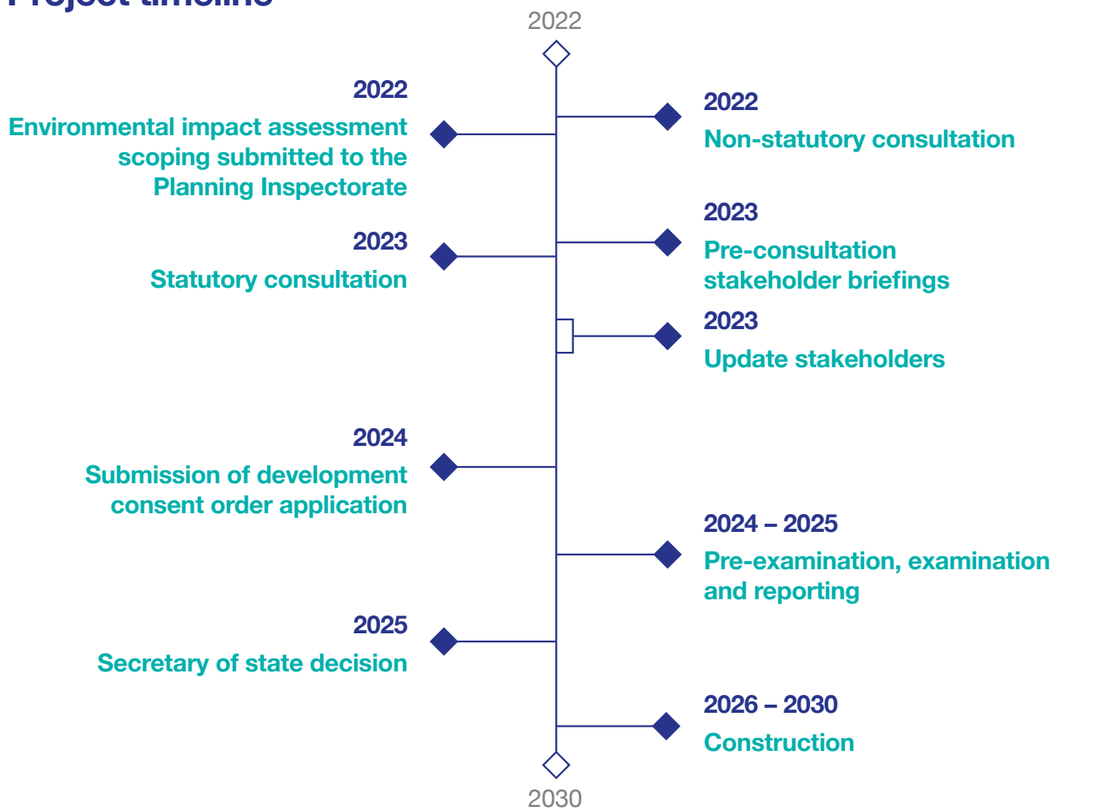
Following the statutory consultation, we will review the responses and prepare our submission documents, including the environmental statement, which will set out the likely effects of the project. Once all documents have been prepared, we will submit an application to the Planning Inspectorate, seeking consent for the reinforcement and associated development. This will include seeking powers of compulsory purchase of land and rights, as necessary.

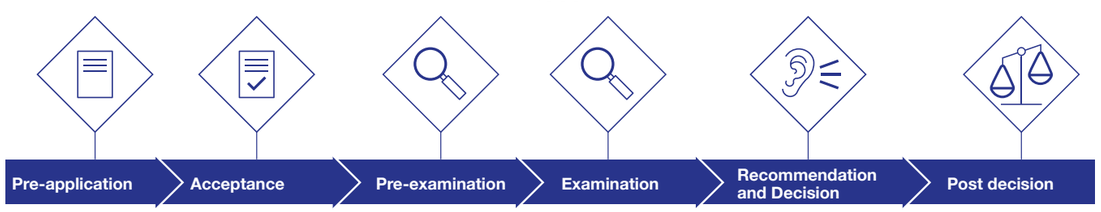
Once submitted, it can take up to 18 months for the application to be determined. The Planning Inspectorate, on behalf of the Secretary of State, will decide whether the application meets the standards required to be formally accepted for examination. If the application is accepted, the Examining Authority, 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 and 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.

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

Project timeline





We are here

Before submitting an application, potential applicants have a statutory duty to carry out consultation on their proposals

The Acceptance stage begins when an applicant submits an application for development consent to the Planning Inspectorate.

There follows a period of up to 28 days (excluding the date of receipt of the application) for the Planning Inspectorate, on behalf of the Secretary of State, to decide whether or not the application meets the standards required to be accepted for examination.

At this stage, the public will be able to register with the Planning Inspectorate to become an Interested Party by making a Relevant Representation.

The Planning Inspectorate has up to six months to carry out the examination. During this stage Interested Parties who have registered by making a Relevant Representation are invited to provide more details of their views in writing.

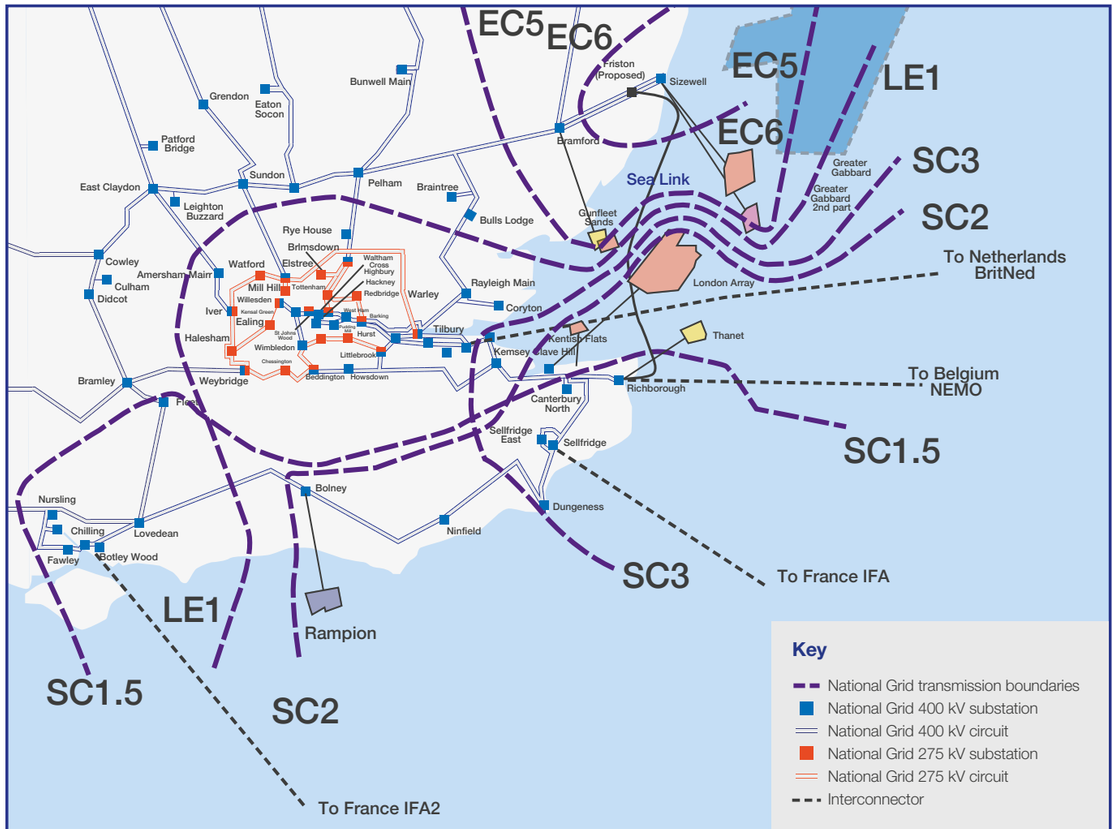
The Planning Inspectorate must prepare a report on the application to the relevant Secretary of State, including a recommendation, within three months of the close of the six month Examination stage.

The relevant Secretary of State then has a further three months to make the decision on whether to grant or refuse development consent.

Once a decision has been issued by the relevant Secretary of State, there is a six week period in which the decision may be challenged in the High Court. This process of legal challenge is known as Judicial Review.

16. Project maps and information

Existing transmission network across the east and east coast



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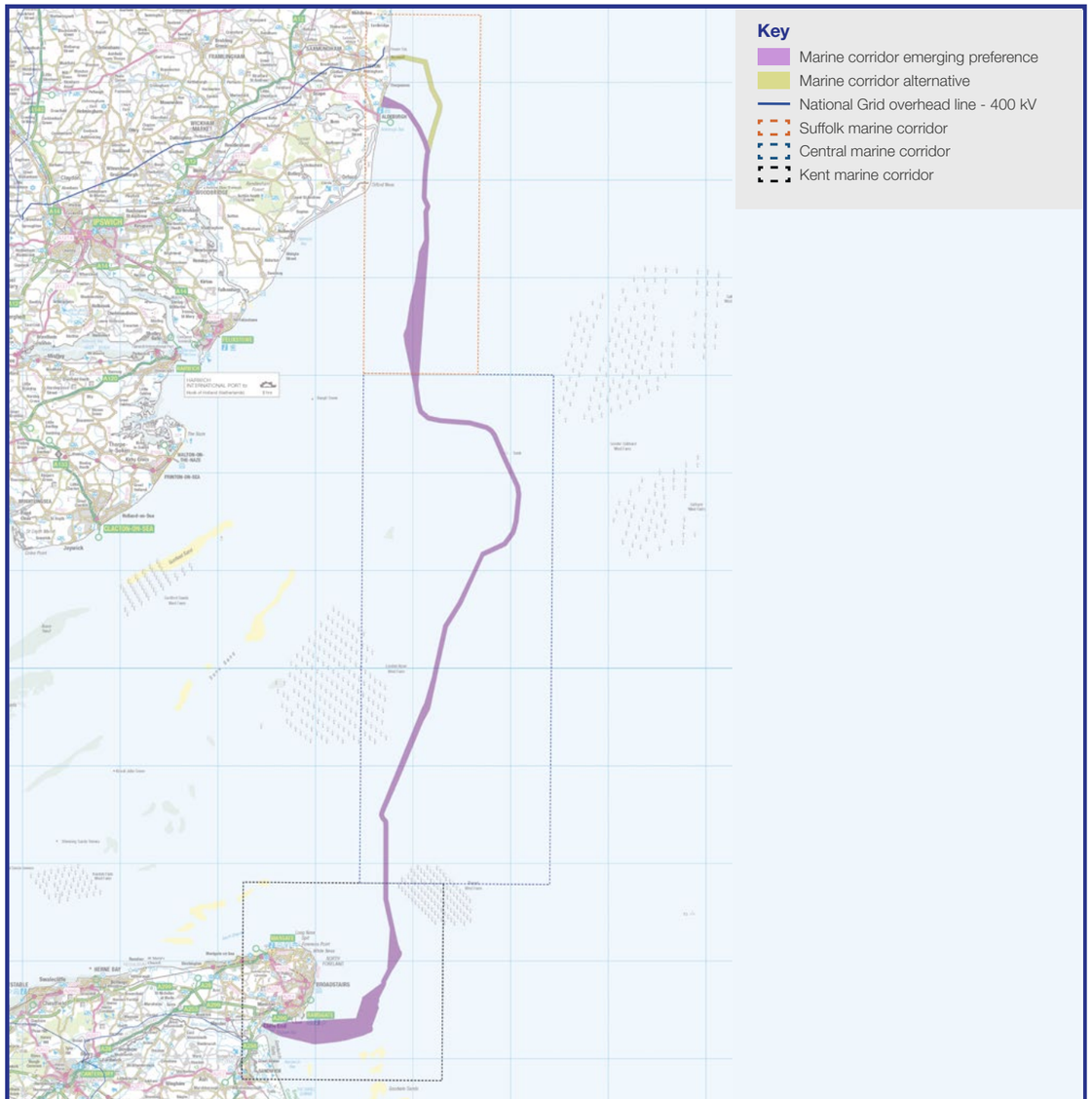
Marine route corridor



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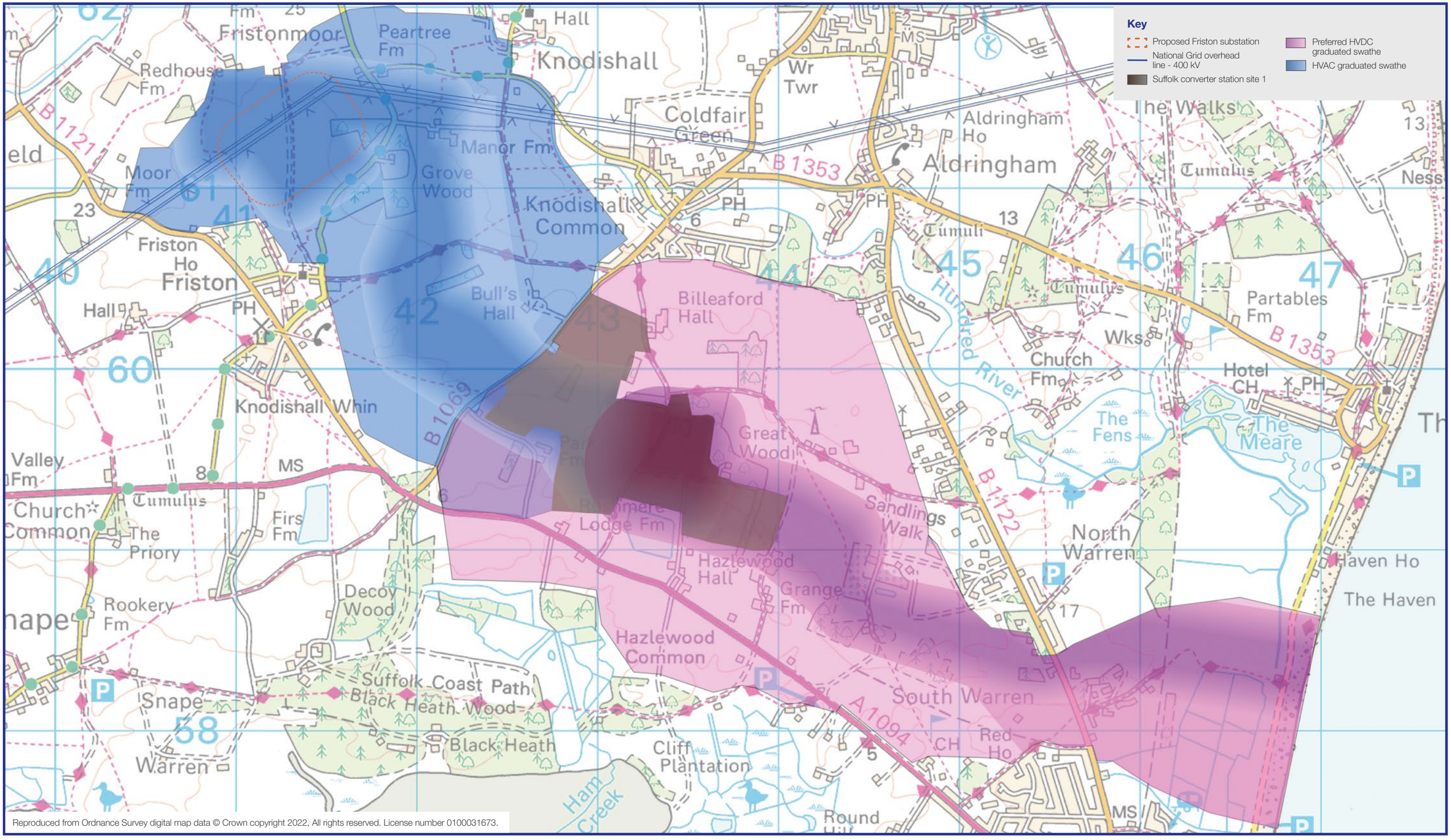
Suffolk site 1 emerging preference



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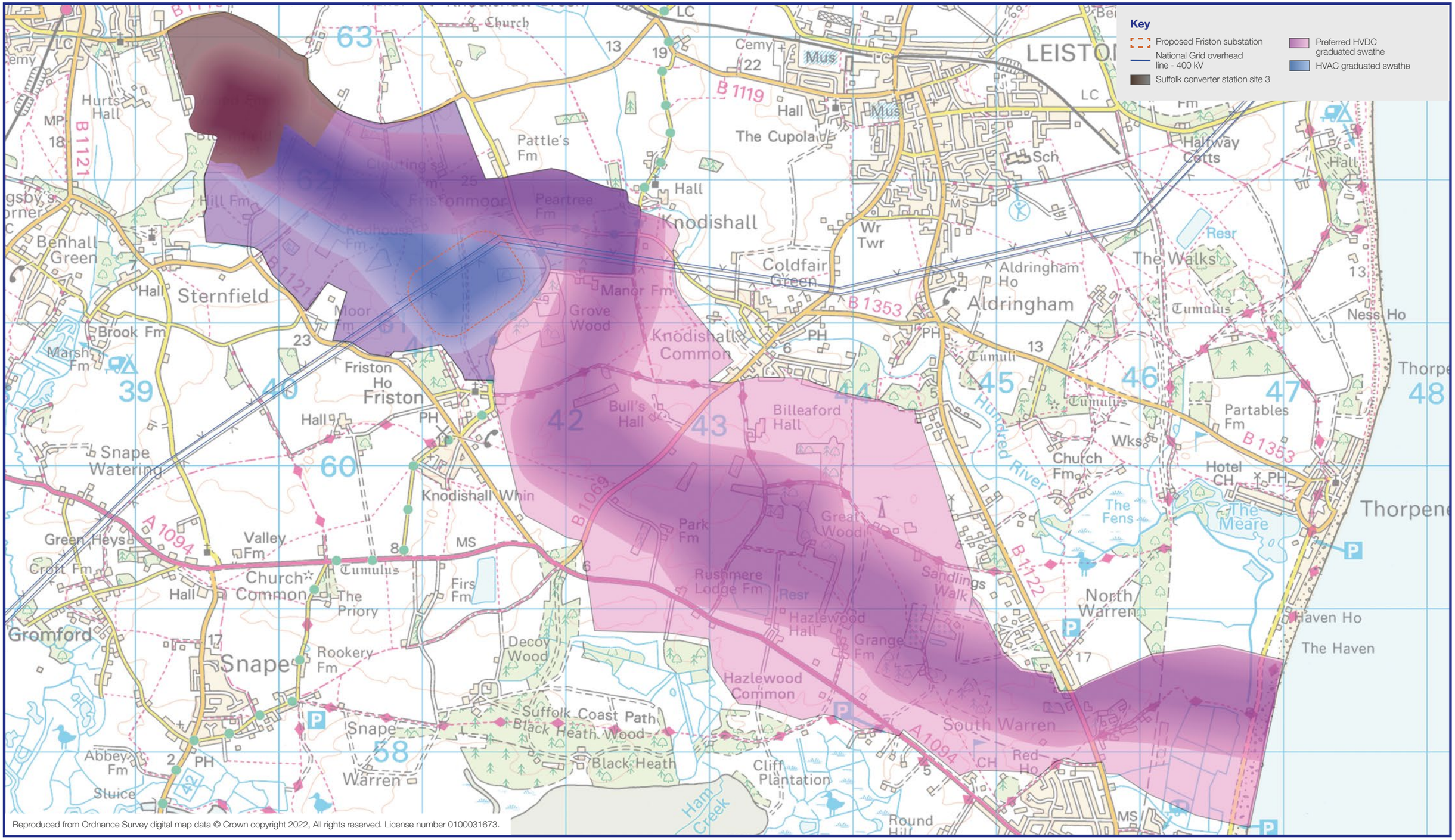
Sea Link project background document October 2022 | National Grid

Suffolk site 3 emerging preference



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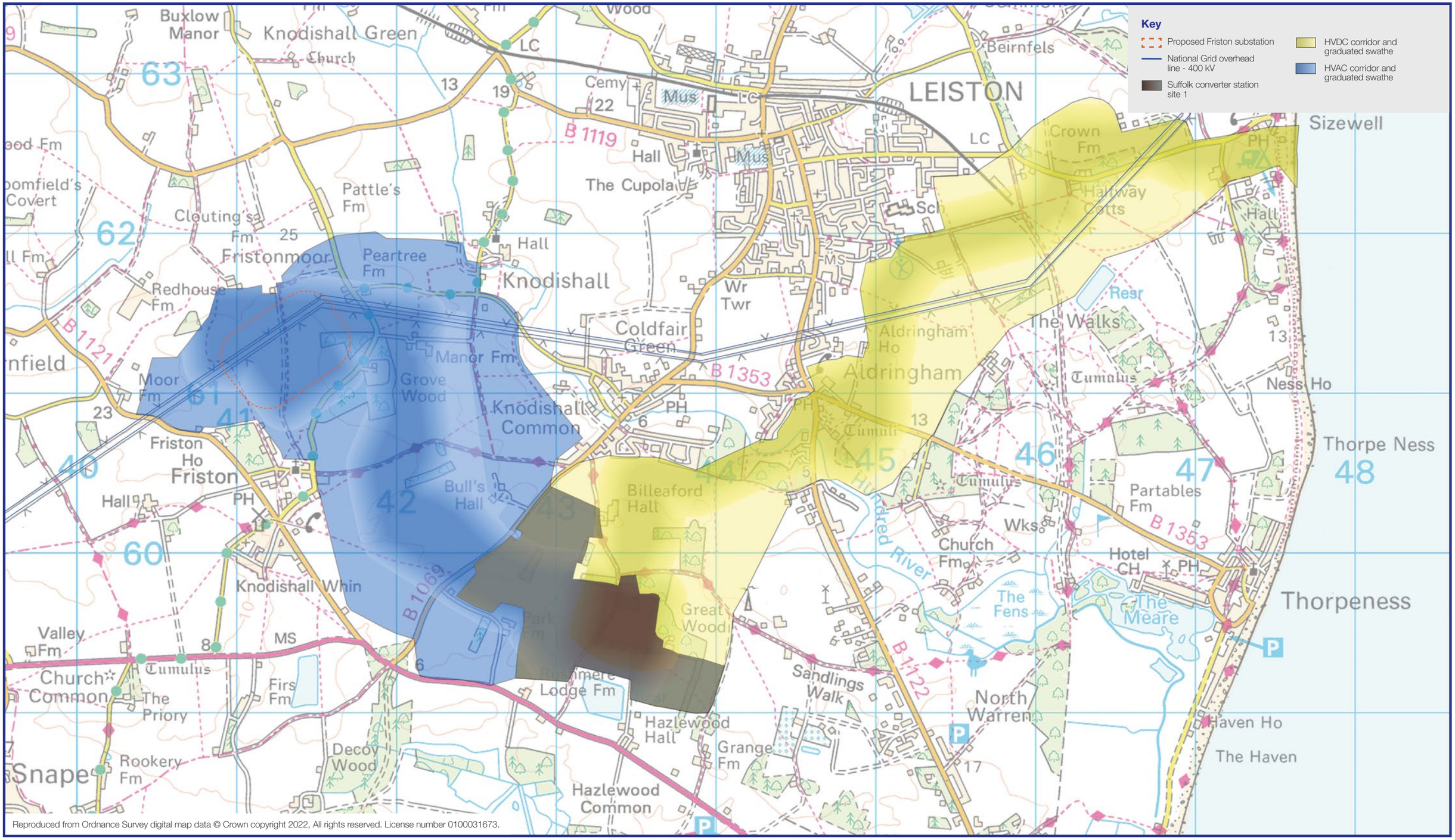
Suffolk site 1 alternative



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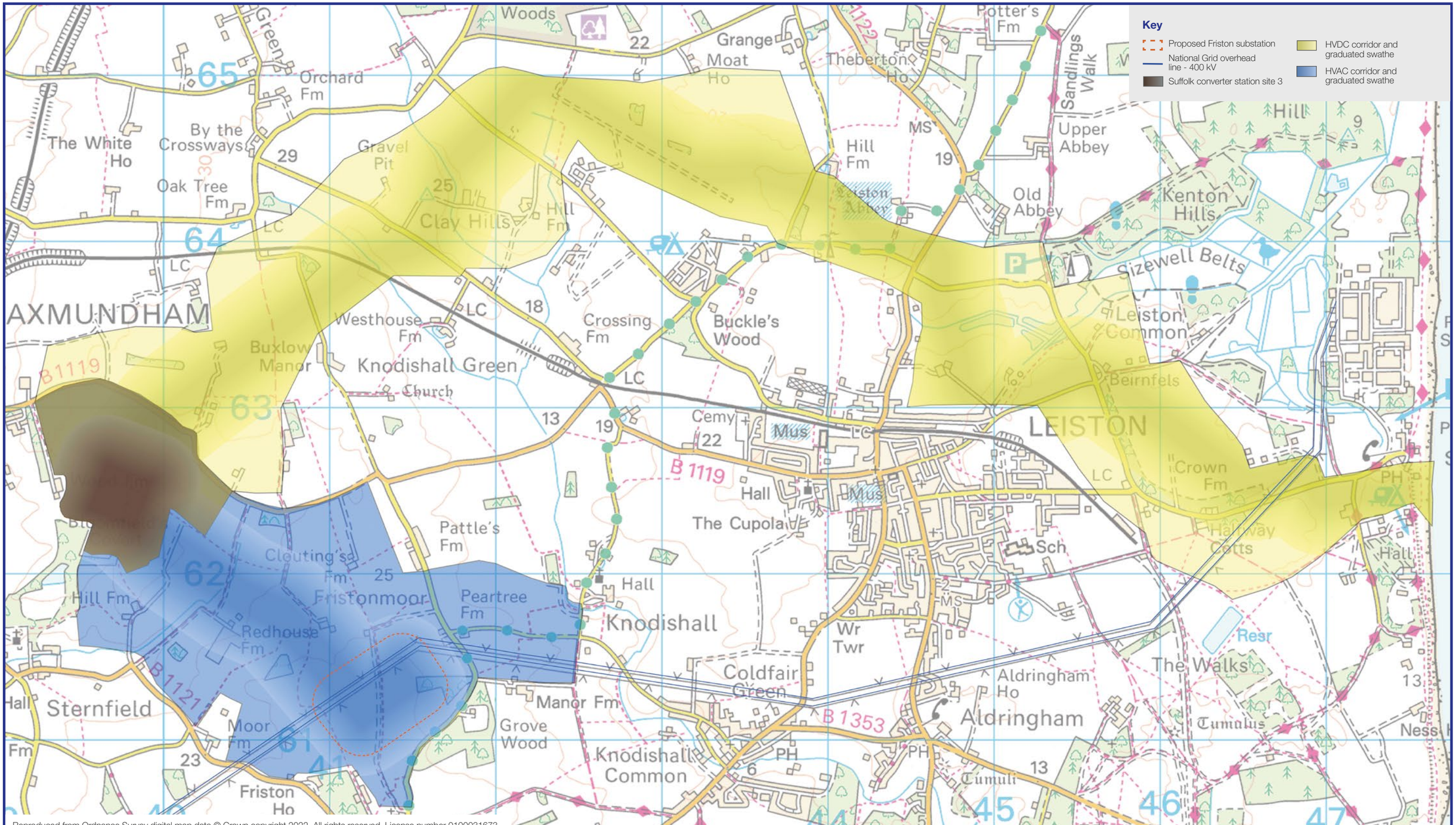
Suffolk site 3 alternative (option 1)



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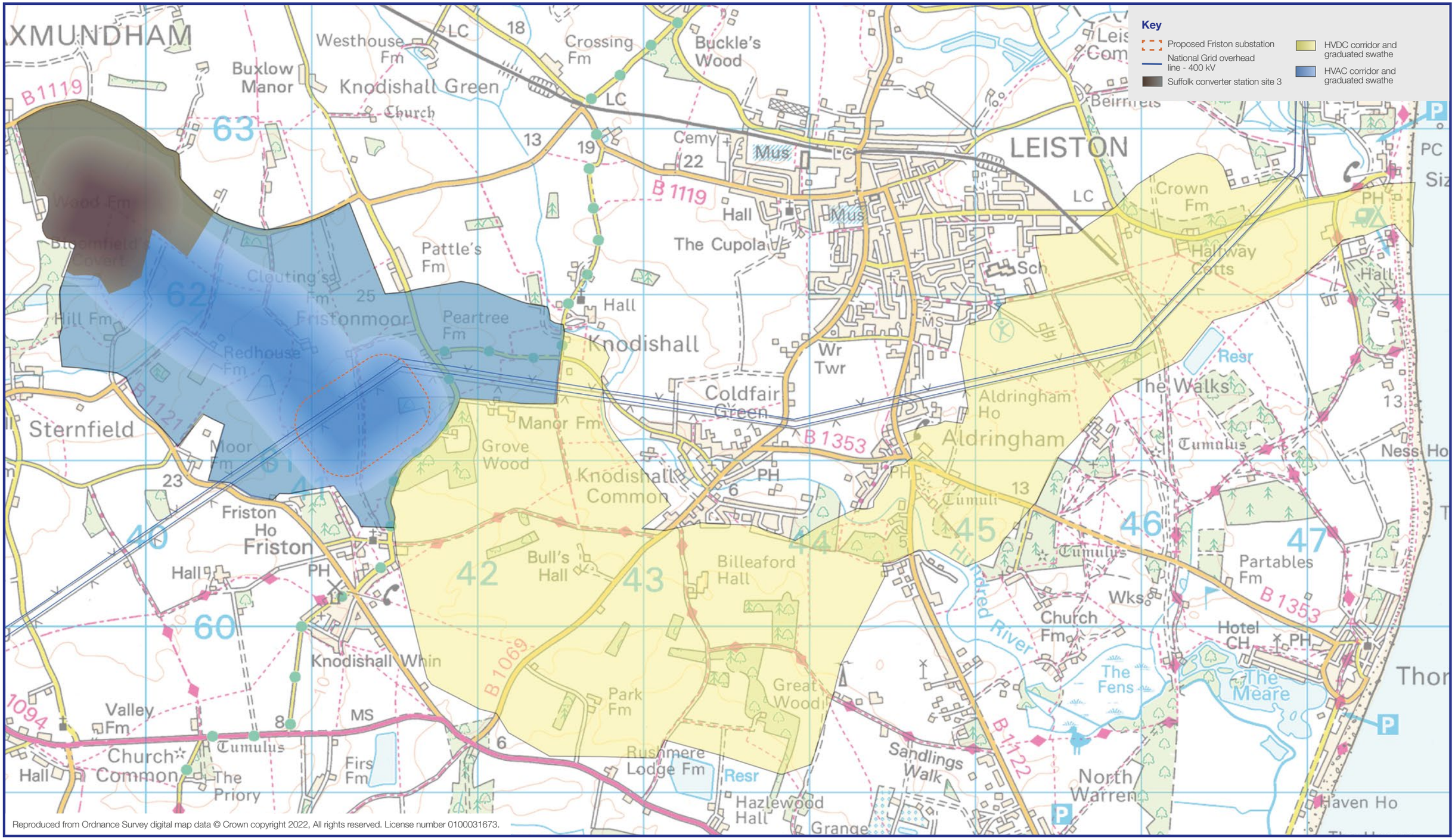
Suffolk site 3 alternative (option 2)



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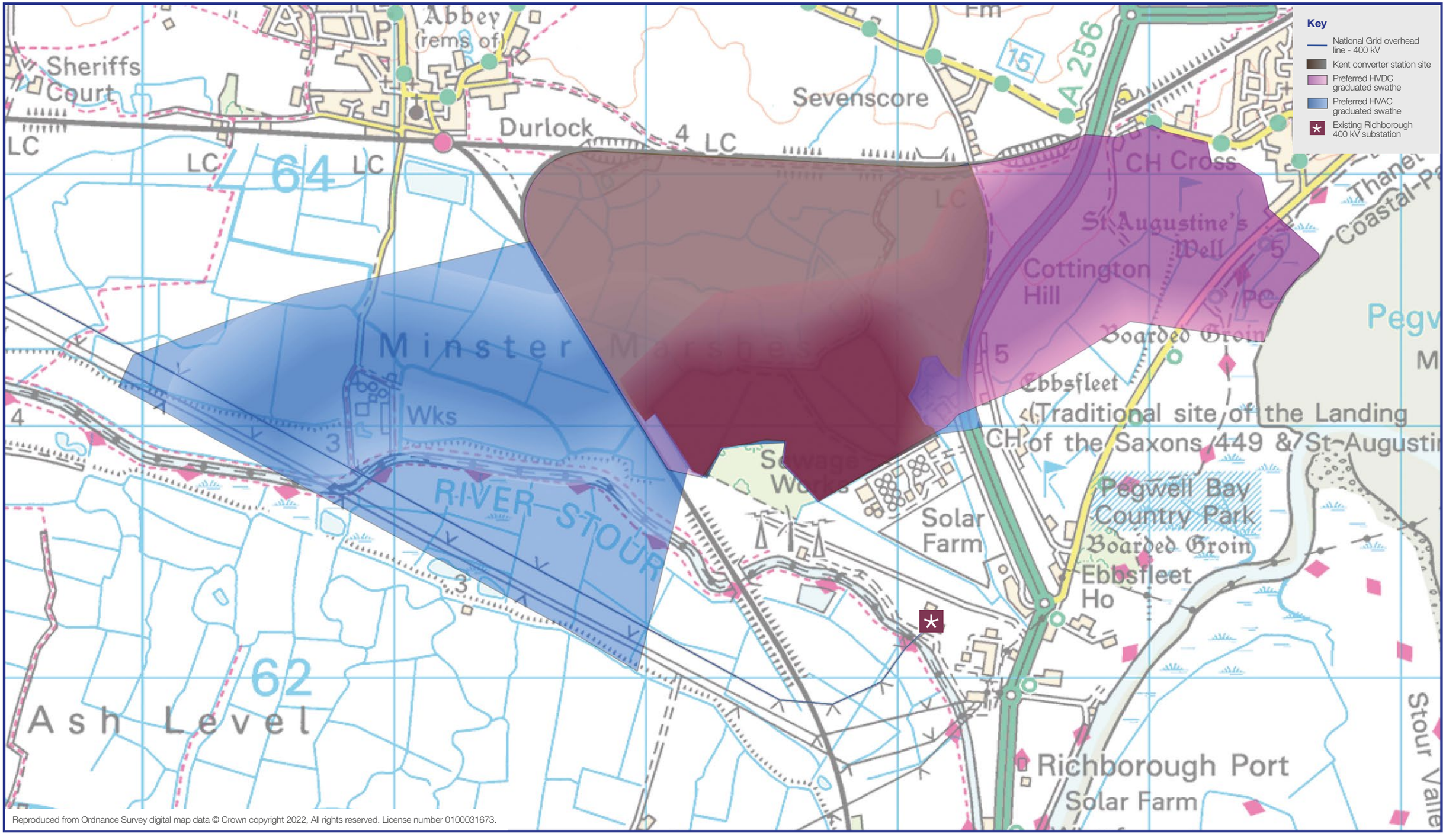
Kent emerging preference



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17. Glossary

British Energy Security Strategy
A strategy, published by the Government in April 2022, which sets out how the UK will work towards security of supply/energy independence. The driving factor for this is rising global energy prices, provoked by increases in demand post-pandemic and the Russian invasion of Ukraine. It also reinforces previous government ambitions about increasing the amount of offshore wind and nuclear generation, as a means of achieving security of supply.

Brownfield land
Land that has been previously developed.

Business separation
Ofgem licence requirements that are represented by a series of rules defining how engagement between group businesses can take place, and a code of conduct to ensure National Grid's monopoly businesses do not exploit their dominant position to gain an unfair commercial advantage in other competitive markets.

Cable corridor
The area within which underground or overhead lines will be installed.

Cable sealing end compound
A facility which transfers a transmission line from underground cabling to overhead line, and vice versa.

Converter station
Converts direct current (DC) into alternating current (AC) and vice versa, depending on the direction of operation.

Development consent order (DCO)
A DCO is the means of obtaining (planning) consent for a development categorised as a Nationally Significant Infrastructure Project (NSIP). This includes energy, transport, water, and waste projects.

Distribution network operator (DNO)
These companies operate the local electricity distribution systems across the United Kingdom.

Environmental net gain
An approach to development that leaves the environment in a better state than before, including both biodiversity net gain and natural capital ecosystem service provisions.

EuroLink
A proposal to build a HVDC interconnector cable between England and the Netherlands, developed by National Grid Ventures.

Future Energy Scenarios (FES)
National Grid reviews and publishes a range of Future Energy Scenarios each summer. These represent different credible scenarios for how quickly the UK might make the transition to net zero by 2050.

Graduated swathe
Indicates the potential area within which the cable corridor could be located. Darker colours reflect the areas which are more likely to be developed.

High voltage alternating current (HVAC)
Power is generated and predominantly transmitted across our electrical system as HVAC. Alternating Current (AC) power is well suited to efficient transmission and distribution as the voltage can be increased or decreased with the use of transformers, which rely on the magnetic fields to work.

High voltage direct current (HVDC)
A HVDC electric power transmission system is more efficient in transferring power over long distances when compared to HVAC. HVDC is considered advantageous for offshore electricity transmission systems.

Horizontal directional drilling (HDD)
A technique whereby a narrow tunnel is drilled under a waterway or other designated area (such as Areas of Outstanding Natural Beauty (AONB), and a pipeline or other utility is pulled through the drilled underground tunnel.

High voltage cable
An insulated cable used for electricity transmission at high voltage that can be buried.

High voltage compounds
The operational compound containing high voltage electrical equipment.

Electricity interconnector
Interconnectors are high voltage cables that connect different electricity systems, such as the systems of different countries, they enable excess power to be traded and shared.

Landfall
The location where offshore cables come ashore.

National electricity transmission system (transmission system)
National Grid own the national electricity transmission system in England and Wales. The system consists of approximately 4,500 miles of overhead line, over 900 miles of underground cable and over 300 substations.

National Grid
National Grid is an energy company operating in the UK and US. We deliver electricity and gas safely, reliably, and efficiently to the customers and communities we serve – all while working towards a clean energy future.

National Grid Electricity System Operator (ESO)
National Grid ESO is the electricity system operator for Great Britain.

National Grid Electricity Transmission (NGET)
NGET owns and maintain the high-voltage electricity transmission network in England and Wales.

National Grid Ventures (NGV)
National Grid Ventures is the competitive division of National Grid plc, one of the largest investor-owned energy companies in the world. NGV operates outside of National Grid's core regulated businesses.

Nationally Significant Infrastructure Projects (NSIPs)
NSIPs are major infrastructure projects that are considered by the Government as nationally important, permission to build NSIPs is given at the national level, by the Secretary of State.

Nautilus
A proposal to build a HVDC interconnector cable between England and Belgium, developed by National Grid Ventures.

Network boundary
The national electricity transmission system is split into different parts – known as system boundaries - and circuits carry power between different sections of the network.

Network Development Policy (NDP)
The NDP provides the framework on which NGET decides to proceed, not start or to delay wider investment in an economic, efficient, and coordinated manner.

Network Options Assessment (NOA)
The NOA is an annual report published by National Grid ESO which outlines its recommendations for projects to take forward during the coming year.

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 now and in the future by working to deliver a greener, fairer energy system.

Offshore Transmission Network Review

The Business Energy and Industrial Strategy (BEIS) department's Offshore Transmission Network Review looks into the way that the offshore transmission network is designed and delivered,

Planning Inspectorate

The Planning Inspectorate is the government agency responsible for examining proposals for Nationally Significant Infrastructure Projects (NSIPs).

Security and Quality of Supply Standard (SQSS)

The Security and Quality of Supply Standard sets out the criteria and methodology for planning and operating the transmission system.

Substation

Where overhead power lines or underground cables are switched and where electricity is transformed to lower voltage for distribution to surrounding areas.

The Crown Estate

The Crown Estate manages the seabed and half the foreshore around England, Wales and Northern Ireland, along with a portfolio of commercial property.

The Department for Business, Energy & Industrial Strategy (BEIS)

BEIS is the ministerial department with primary responsibility for energy.

The Holford Rules

Guidelines for the routeing of high voltage overhead transmission lines. These are important guidelines during the development of a preferred route when considering if certain sections should be undergrounded.

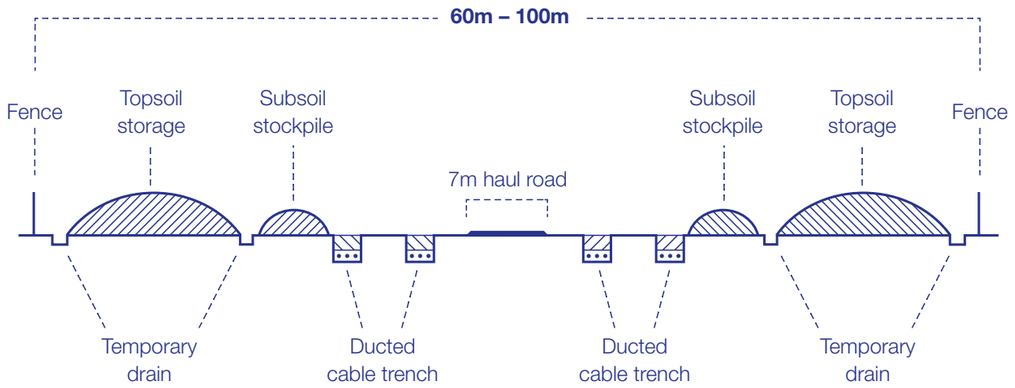
The Horlock Rules

Guidelines for the design and siting of substations and converter stations (in addition to cable sealing end compounds and line entries). When considering new electricity infrastructure, National Grid has regard to the degree to which options comply or deviate from these rules.

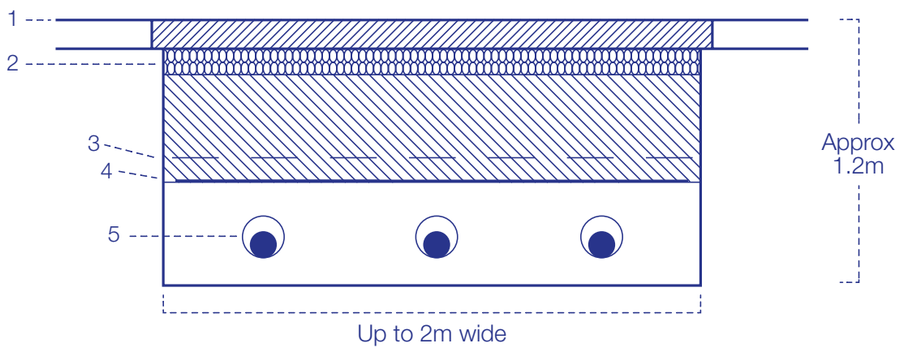
Transition joint bay

The joint at which the subsea cables are connected to the onshore cables near to the coast.

AC swathe



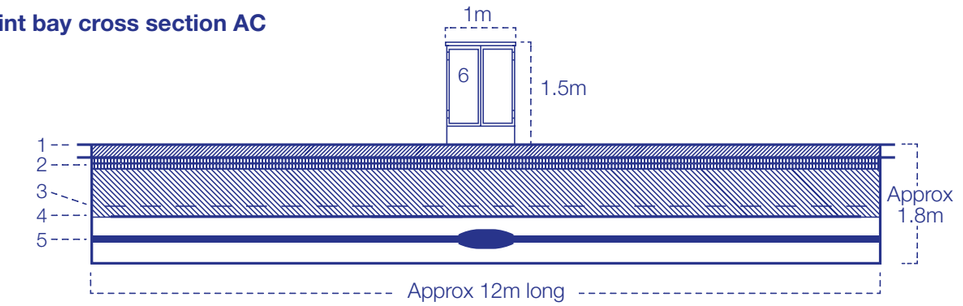
AC cable trench



1. Ground level
2. Sub-base
3. Warning tape
4. Protective tile
5. Cable duct with AC cable

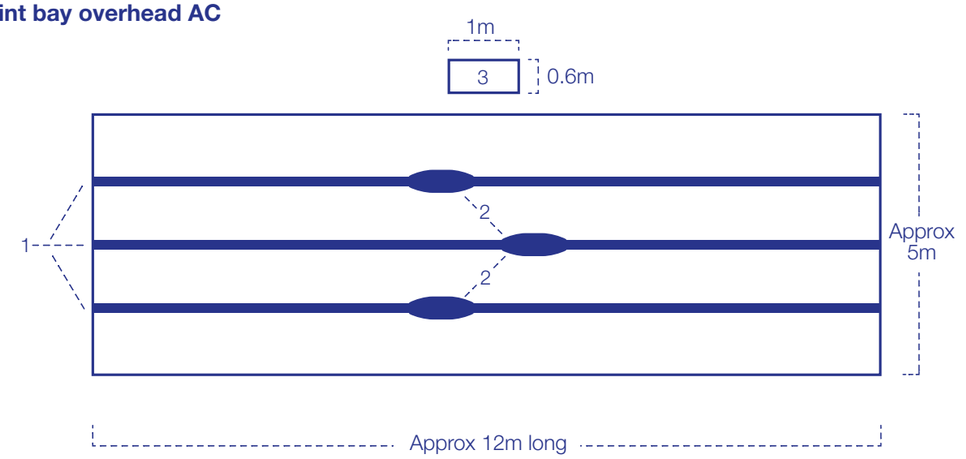
AC joint bay

Joint bay cross section AC



1. Ground level 2. Sub-base 3. Warning tape 4. Protective tile 5. Cable and cable joint 6. Link box

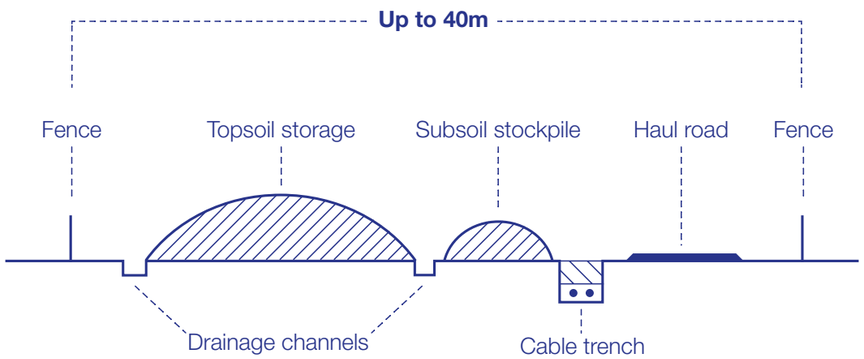
Joint bay overhead AC



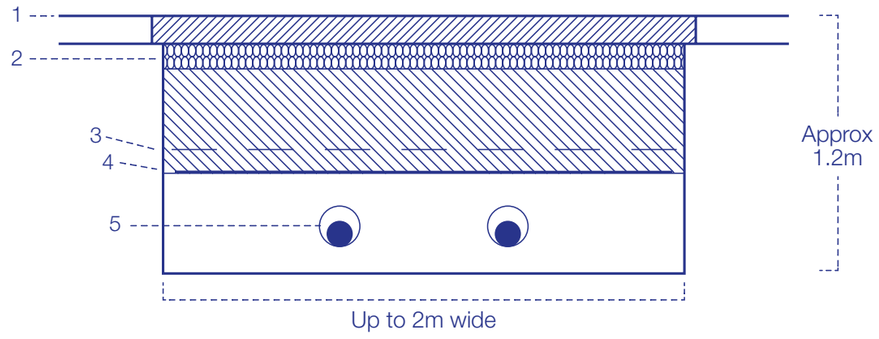
1. Underground cable 2. Cable joint 3. Link box

DC swathe

Cross section of a typical construction swathe for DC cabling works



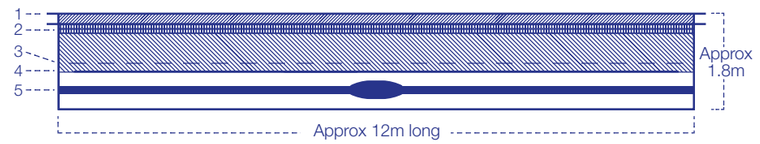
DC cable trench



1. Ground level
2. Sub-base
3. Warning tape
4. Protective tile
5. Cable duct with DC cable

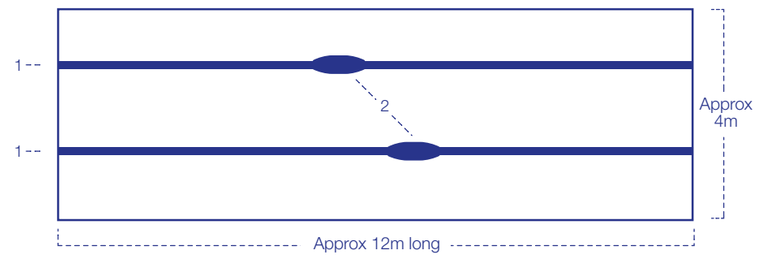
DC joint bay

Joint bay cross section DC



1. Ground level 2. Sub-base 3. Warning tape 4. Protective tile 5. Cable duct with cable joint

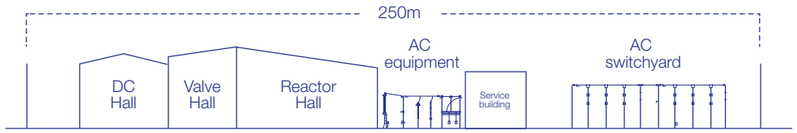
Joint bay overhead DC



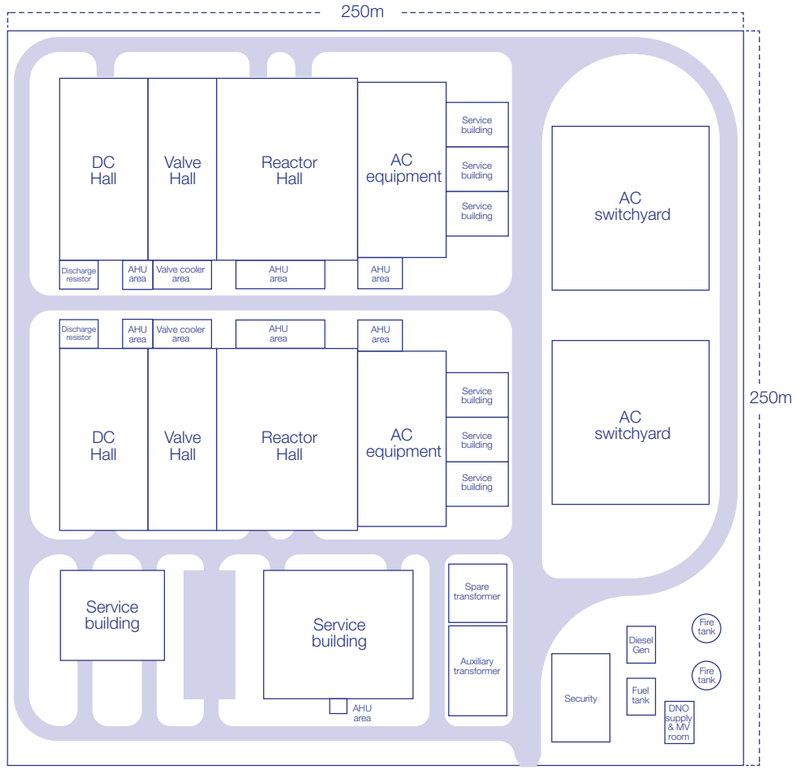
1. Underground cable 2. Cable joint

Converter station

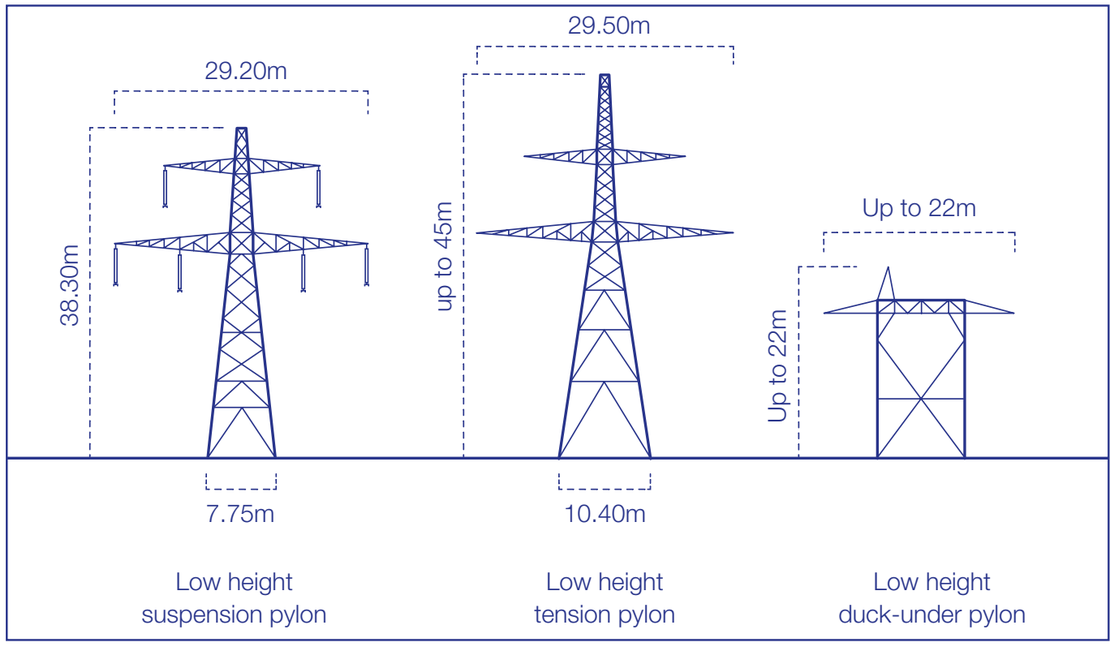
Convertor station cross section



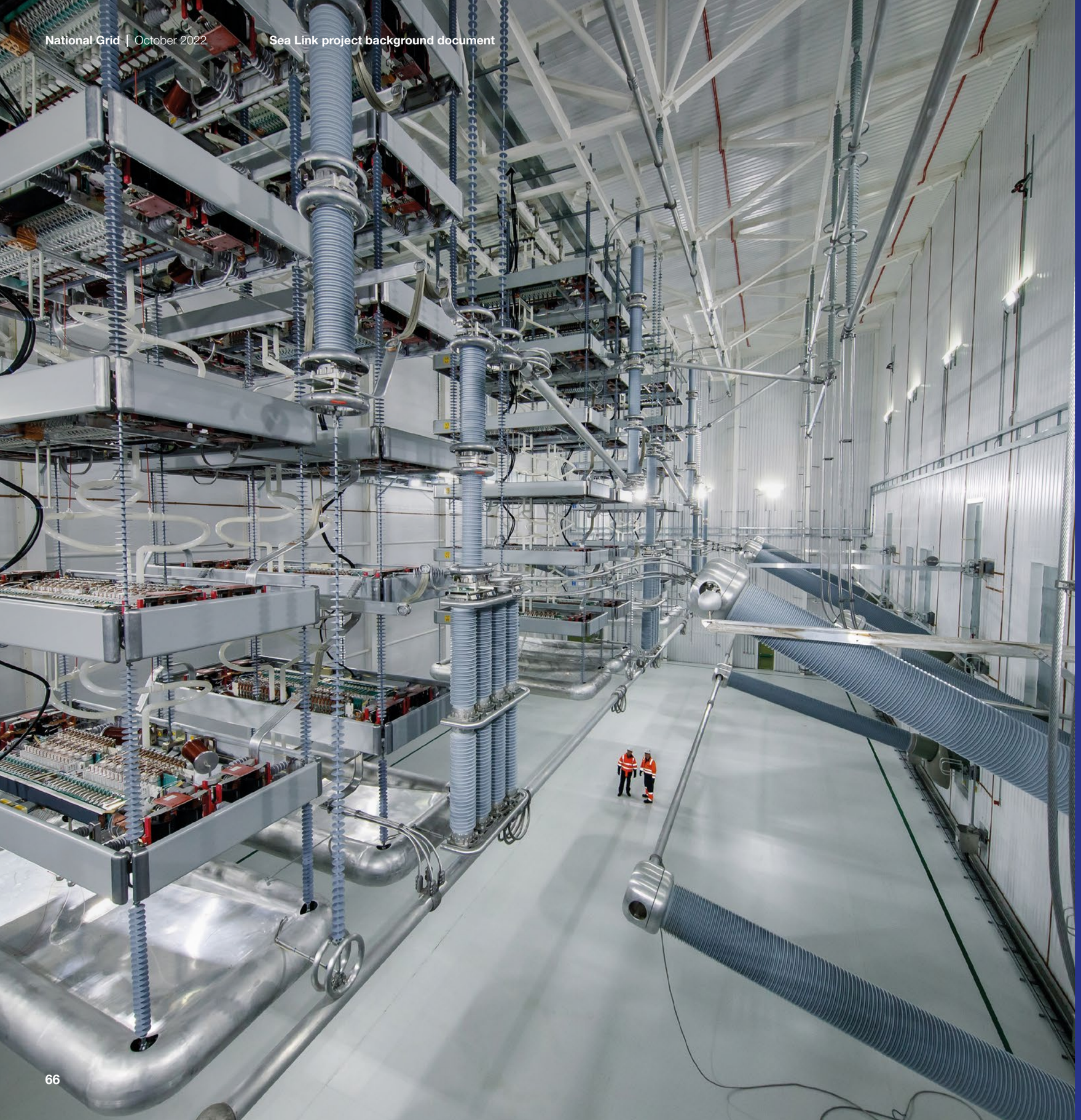
Convertor station overhead



Pylons (Kent*)



*Being considered for the connection into the existing transmission network in Kent



Contact us

Please get in touch if you have any questions:

Complete a feedback form

We have produced an online feedback form for you to fill in and submit on our website at **nationalgrid.com/sealink**

Paper copies of our feedback form will be available to pick up from our face to face public information events and consultation materials deposit points listed in section 13. You can also download and print a copy of the feedback form from our website; alternatively, please get in touch and we will post one to you.

Send us a letter

You can send a letter/or completed feedback form to **Freepost SEA LINK** (no stamp or further address details are required).

Email us

If you prefer to send us your comments via email, you can send them to us at **contact@sealink.nationalgrid.com**

Call us

Freephone **0808 134 9569**
(Lines are open Monday to Friday 9am – 5.30pm)

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 at **nationalgrid.com/media-centre/contacts**

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, please get in touch using the above contact details.

If you feel your land may be affected by these proposals, please contact the Sea Link Land Team by calling **01452 889000** or by emailing **SeaLink@dalcourmaclaren.com**

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