VikingLink

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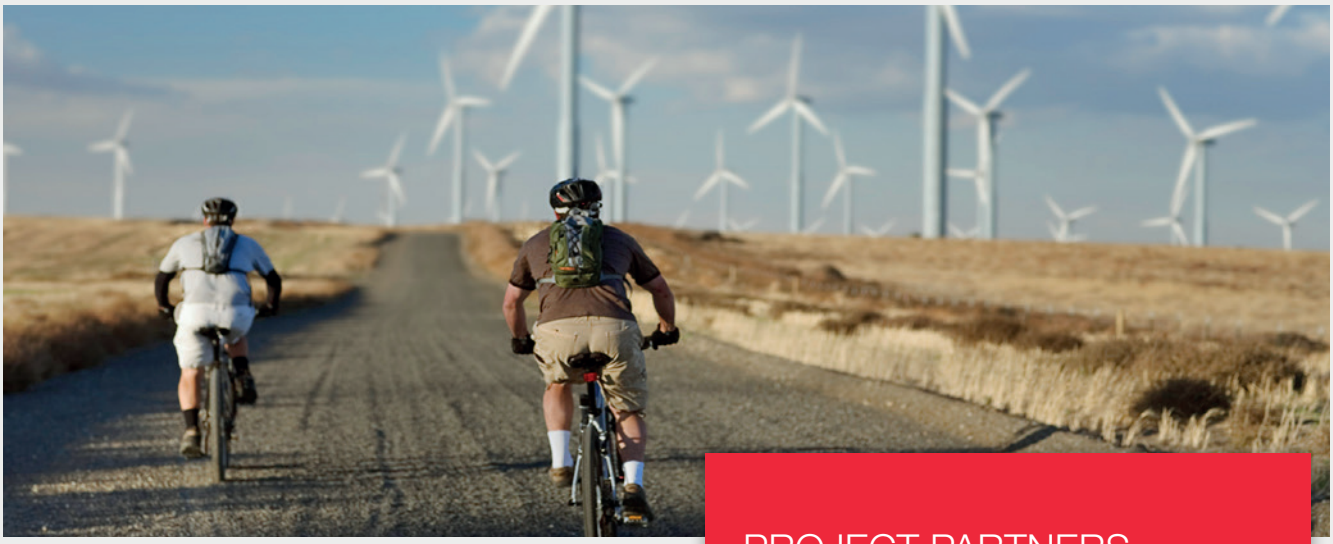
Viking Link Interconnector

Connecting Danish and British electricity systems

Information Leaflet for Public Participation under the TEN-E regulation.

Affordable, Secure and Green Energy



National Grid Viking Link Limited (NGVL) and Energinet.dk are developing a proposal for a new high voltage Direct Current (DC) electricity interconnector between Great Britain and Denmark, connecting to the existing Danish and British electricity transmission systems – known as Viking Link.

Viking Link will enable more effective use of renewable energy, access to sustainable electricity generation and improved security of electricity supplies. Thus it will have socioeconomic benefits for both Denmark and Great Britain and the wider European community.

Viking Link is in line with the European Commission's aim for an integrated energy market to ensure value for money for consumers and provides the opportunity to transport renewable energy to centres of consumption. Viking Link has therefore been included on the European Union List of Projects of Common Interest (PCI).

As a PCI, Regulation (EU) No 347/2013 on guidelines for trans-European energy infrastructure, referred to as the 'TEN-E Regulation' applies to Viking Link, and sits alongside other relevant legislation in each country.

The TEN-E Regulation has been developed to ensure the timely development and interoperability of energy networks in Europe and it sets out guidelines for streamlining the permitting processes for major energy infrastructure projects that contribute to European energy networks.

PROJECT PARTNERS

Viking Link is being jointly developed by National Grid Viking Link Limited (NGVL) and Energinet.dk.

National Grid Viking Link Limited is a wholly owned subsidiary of National Grid Group and has been granted an interconnector licence by the energy regulator Ofgem. NGVL is legally separate from National Grid Electricity Transmission Plc. (NGET) which has the licence to own and operate the high voltage electricity transmission system in England and Wales.

Energinet.dk is an independent public enterprise owned by the Danish Ministry of Energy, Utilities and Climate. The enterprise owns and operates Denmark's main electricity and natural gas networks, helping supply people, businesses and institutions with reliable energy now, tomorrow and in the years to come. Through international and market based solutions, working together across the energy sector's value chain, Energinet.dk strives to achieve balance in a sustainable energy system with increasing amounts of renewable energy.

What is Viking Link?

Viking Link is a proposed 1400 Megawatt (MW) high voltage DC electricity link connecting the electricity transmission systems at Bicker Fen in Lincolnshire, Great Britain and Revsing in southern Jutland, Denmark, crossing through the territorial waters of both the Netherlands and Germany.

Viking Link will be approximately 760 kilometres in total length and is planned to be in operation in 2022.

The Technical Project

Viking Link will be made up of submarine and underground cables with an optional fibre optic cable connected to a converter station and existing electricity substation in Great Britain and Denmark, allowing electricity to flow in either direction between the two countries.

The offshore section of the project will consist of a pair of high voltage DC submarine cables buried in the sea bed and extending for approximately 630 kilometres between the Great Britain and Denmark.

The submarine cable route corridor will pass through UK, Dutch, German and Danish Exclusive Economic Zones (EEZs).

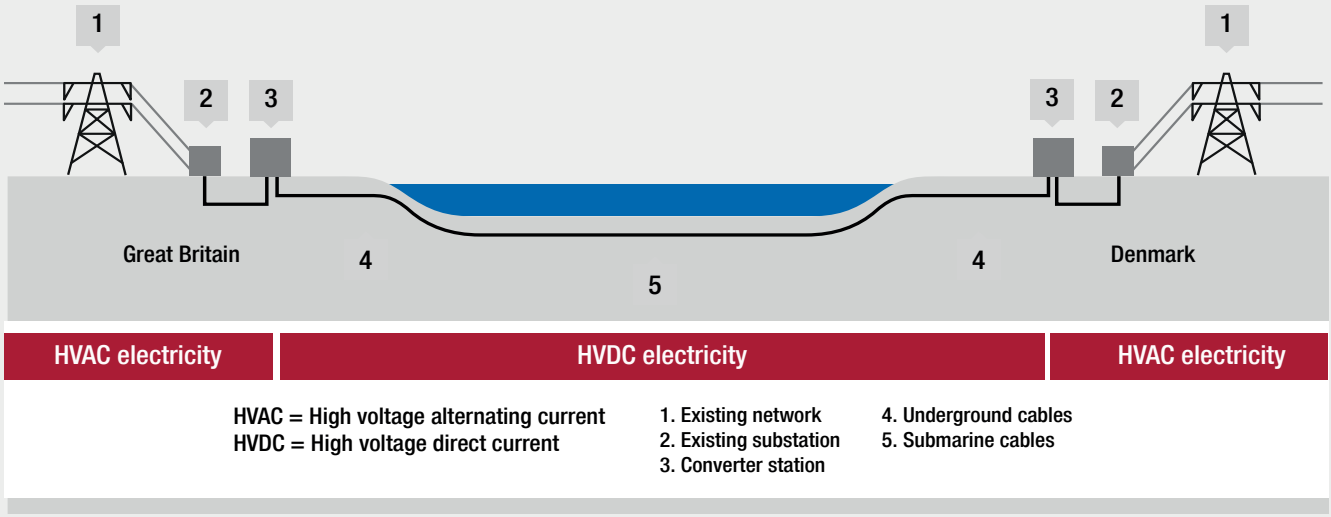
The onshore cable routes will, for the British part of the project be approximately 55 kilometres, and for the Danish part of the project be approximately 75 kilometres long. The onshore DC and fibre optic cables will be buried in one cable trench.

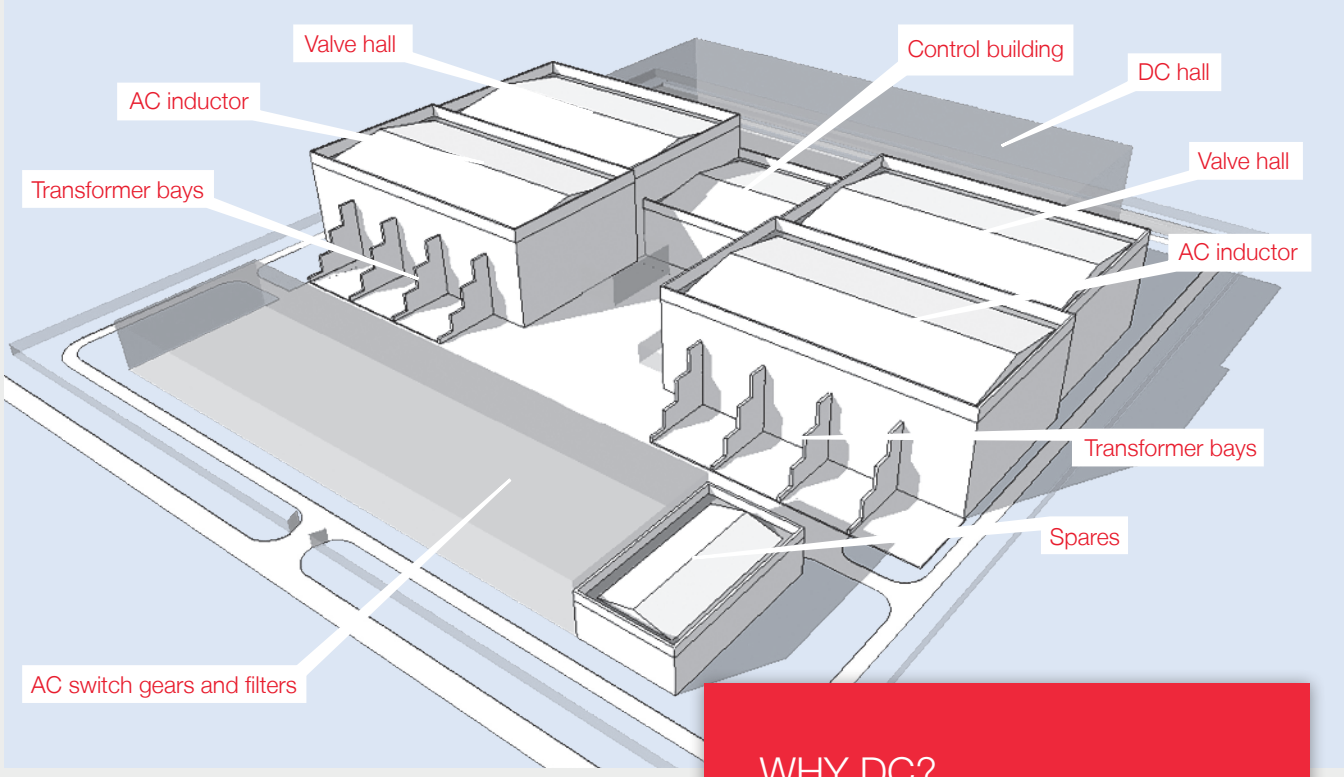
Converter Stations

Viking Link will involve the construction of two converter stations, sited in Great Britain and Denmark. The stations will occupy a footprint each of approximately 4 to 5 hectares. Additional land may be required for access and any environmental mitigation that may be required. There will also be some additional temporary land requirements during the construction period for laydown and contractor facilities.

A typical converter station includes a range of technical equipment some of which must be located indoors in a series of large buildings, potentially up to 24m tall. A typical converter station includes:

- Control Room
- Converter power electronics and associated DC equipment
- Alternating Current (AC) switchgear
- Transformers and other associated AC equipment
- Ancillary equipment and spares buildings





The design of the converter station buildings and site layout is expected to be finalised once construction contracts have been awarded in 2018 and will take into account conditions attached to any consents granted.

Underground Cables

The converter stations are connected by a pair of high voltage DC underground and submarine cables. Typically, the cables are around 150 mm in diameter and will operate at a voltage of 500 kilo Volt (kV).

Within Great Britain buried AC cables will connect the converter station to the existing high voltage electricity transmission system substation.

WHY DC?

Direct Currents are used in interconnector projects due to minimal losses associated in the transportation of high voltage electricity over long distances. This electricity will need to be converted to Alternating Current (AC) before it is channelled to consumers and /or used in our homes / businesses

Offshore Route

The offshore routing has been a focus in the project development to date, and several route studies have been developed.

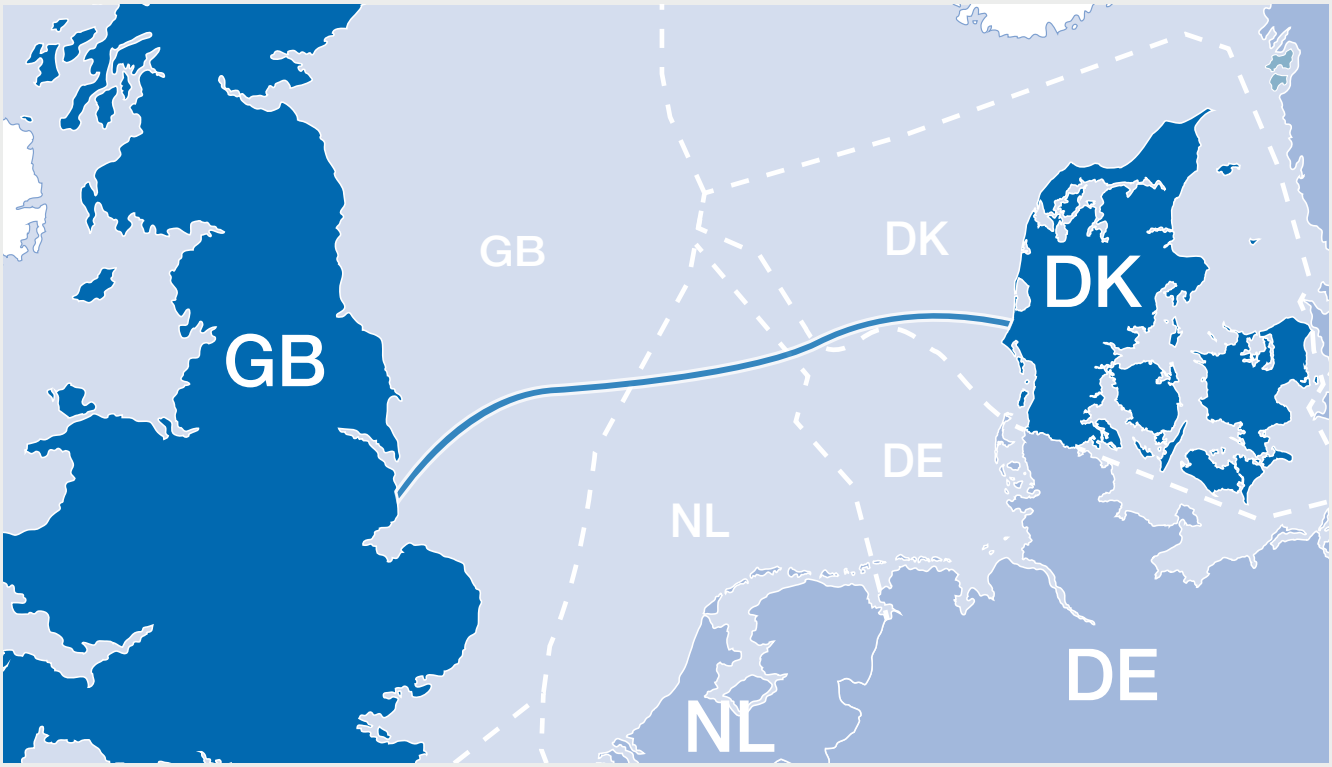
The outcome of the studies of a number of route options has been discussed with a wide range of key authorities and stakeholders including, but not limited to, Marine Management Organisation (MMO), Joint Nature Conservation Committee, Natural England, Rijkswaterstaat, Ministry of Economic Affairs, Federal Maritime and Hydrographic Agency (BSH), Federal Agency for Nature Conservation (BfN), Danish Nature Agency, the Danish Energy Agency, Natural England, fishing communities as well as a range of asset owners in the North Sea.

Based on feedback from authorities and stakeholders, an assessment of identified constraints and an economic evaluation of the route corridor options a seabed survey has been commissioned to take place during Spring and Summer 2016. The survey will help the project to better understand the seabed both from an environmental and engineering perspective.

The main constraints of the alternative cable route corridors been considered incorporate a range of factors including proximity to transport corridors, crossing of Natura2000 and other designated sites, ecologically sensitive areas, significantly increased submarine cable length and conflicts with marine spatial planning. The route corridor to be surveyed avoids any offshore environmental designated areas in Denmark, Germany and Netherlands.

While there is little opportunity to avoid all designated sites in the UK area, the area being surveyed seeks to minimise interactions with these sites where possible taking into account immediate plans for offshore installations, areas with steep gradients and adverse seabed geology. It also seeks to minimise the overall length of the cable.
Based on the seabed survey results, the route may be optimised to avoid identified wrecks, archaeological findings, benthic habitats, geohazards, unsuitable seabed and subseabed conditions, etc.

Public events will be held during Summer 2016 in both Denmark, Germany, the Netherlands and Great Britain to consult on the project.



Onshore Elements in Denmark

Viking Link in Denmark will connect into the electricity transmission system at Energinet.dk's 400kV substation Revsing in Vejen.

The onshore works will involve:

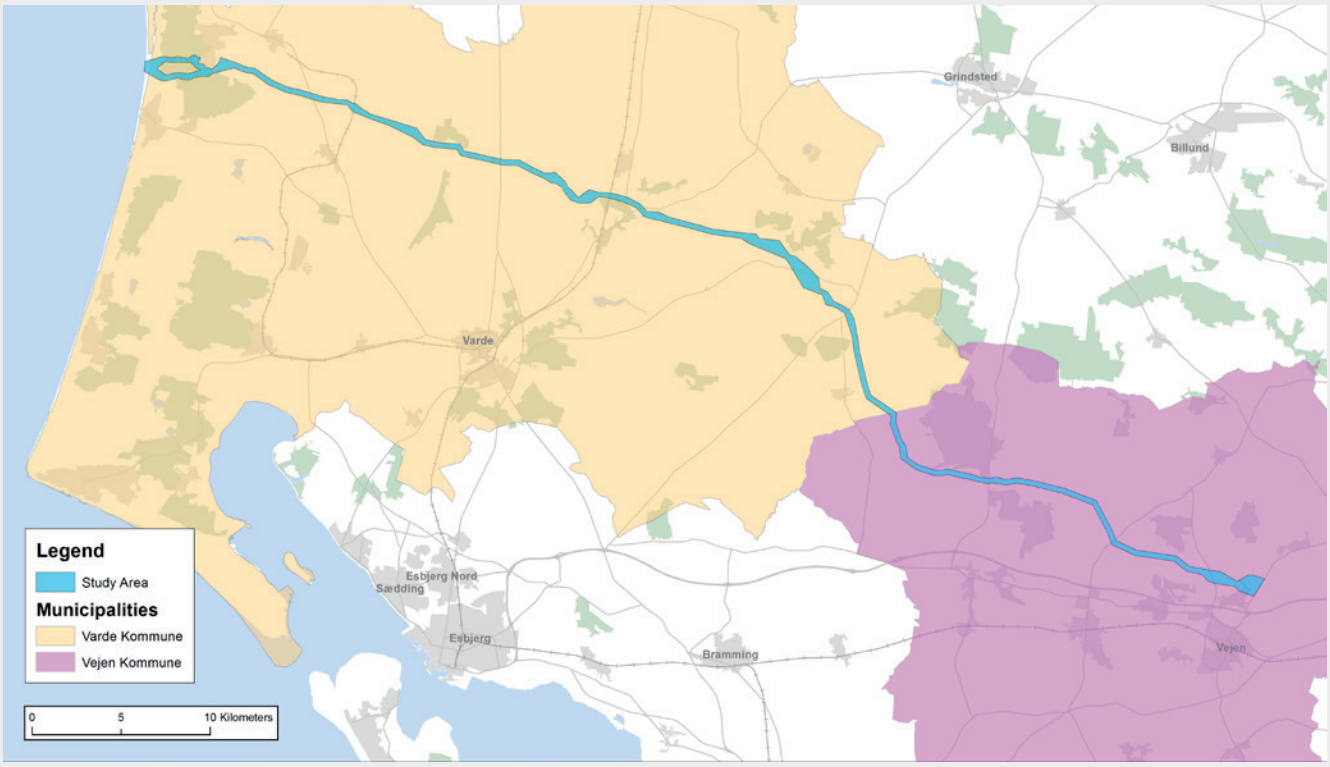
- the installation of a pair of underground DC cables between the landfall at Blaabjerg coast and the converter station.
- a converter station which will be located at Revsing substation

The onshore elements in Denmark have been developed through consideration of potential impacts to the environment and local communities as well as technical considerations. The aim of this approach is to balance consideration of these factors and identify preferred sites for a landfall and converter station, which is technically feasible and economic viable and could be brought forward for public consultation.

The preferred cable route corridor between the landfall and converter station in Denmark has been identified by analysing a wide range of constraints including the location of residential areas and spatial planning. The Viking Link team has discussed the options with representatives from local authorities and statutory bodies.

Potential connection points to the electricity transmission system have been considered and the possibility for connection has been assessed. Revsing has been identified as the preferred option, based on security of supply and minimising the cable lengths. Several landfalls have been considered, including Blaabjerg, Fanø and Skallingen. Blaabjerg is the preferred option.

The onshore elements in Denmark are subject to the Danish onshore planning process under the Planning Act 2015 and will be subject to an Environmental Impact Assessment (EIA).



Onshore Elements in Great Britain

In Great Britain Viking Link will connect into the electricity transmission system at the Bicker Fen 400kV substation.

The onshore works will involve:

- installation of a pair of underground DC cables between the landfall at the Lincolnshire coast and a converter station
- a converter station which will be located near the Bicker Fen substation
- up to 6 high voltage AC cables between the converter station and Bicker Fen substation.

All of the UK onshore elements will require planning permission under the Town and Country Planning Act 1990 and applications will be submitted to the local planning authorities as appropriate.

Potential options for the landfall point and a converter station have been assessed. Discussions have been held with representatives from local authorities and statutory bodies and the Viking Link team met with parish councils and local residents near potential site options.

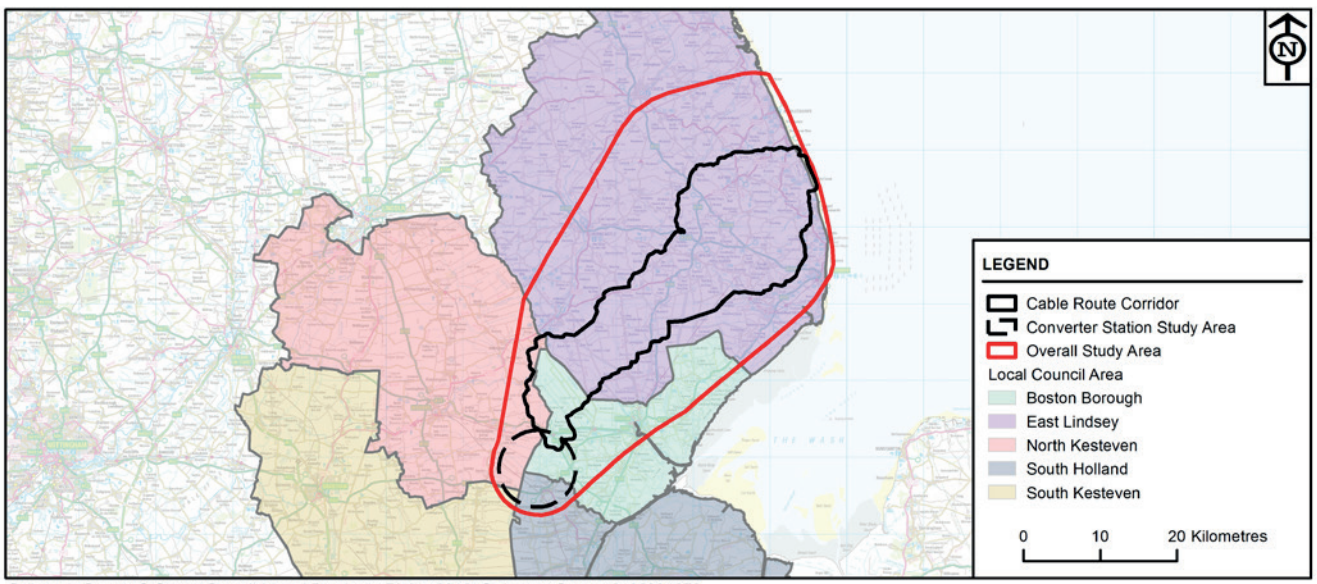
A staged approach to site selection was adopted which took into account potential impacts on the environment and the local communities, relevant planning policy as well as technical and engineering design considerations.

This work has resulted in the identification of 3 potential landfall sites and 4 potential converter station sites. Public consultation on these options has taken place between 11th April and 20th May 2016. After considering feedback NGVL will, during the summer of 2016, announce its preferred converter station and landfall locations.

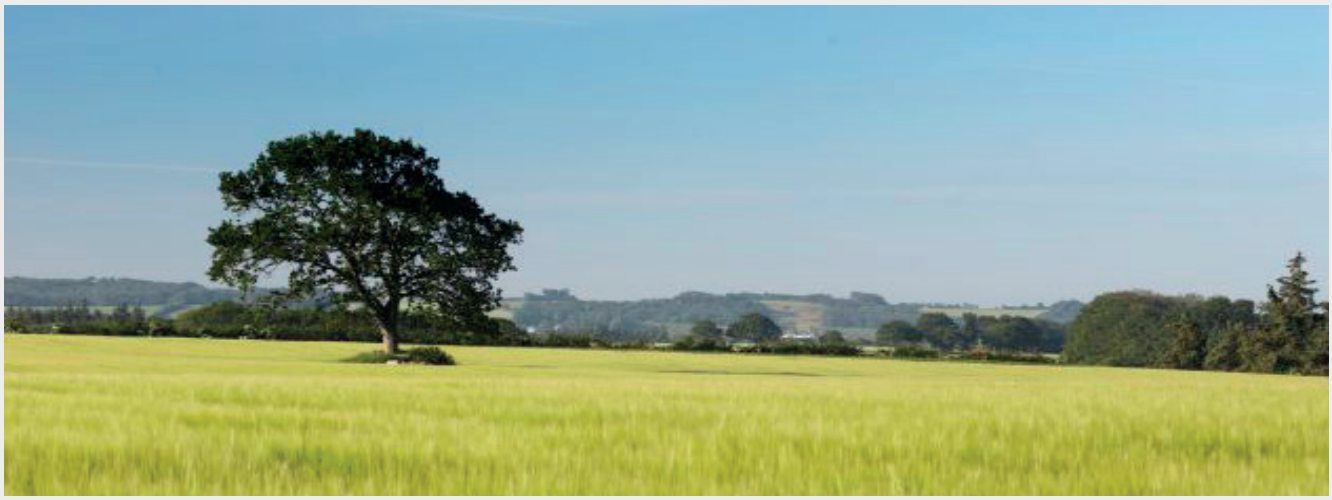
Further consultation will take place during Summer 2016 on potential route corridors, between the preferred landfall and converter station. NGVL will also consult on designs for the converter station"

More information on the alternatives considered for the point of connection and how Bicker Fen substation was selected is set out in the Viking Link Strategic Options Report (April 2016) which is published on the project website.

The map below indicates the Overall Study Area which has been defined for the project. An area for cable route corridors based on the shortlisted landfall and converter stations has also been identified. Alternative corridors which are "bands" of interest that take into account the natural, physical and built environment will be developed within this area for further assessment. A cable route will then be developed within the preferred route corridor option.



Potential Impacts



Various studies have been undertaken to inform the development of the submarine and onshore cable routes as well as the landfall and converter station sites. Environmental considerations and consultation will also inform this process.

As part of the permit applications the project will consider potential impacts, either through EIAs or appropriate assessments, of Viking Link on all relevant physical, biological and human receptors, and will seek to mitigate any potential adverse effects wherever practicable which the proposals may have on the surroundings.

Potential cumulative impacts including cross-boundary impacts will be described and assessed for each set of permit applications. A separate document describing the project from end to end will describe the potential cross-boundary and cumulative impacts

The potential impacts will be assessed for construction, operation and where required by legislation, for decommissioning of the various elements of the project.

Potential Impacts from Offshore Elements

Construction Phase
The construction phase for the offshore elements will have potential adverse impacts on the environment although the impacts will be temporary and for a relatively short period.

Potential impacts from the installation of the submarine cables, such as potential impacts on biotopes and protected species from e.g. sediments spill, will be assessed and in close collaboration with the consenting bodies and scientific advisers, appropriate mitigation measures will be applied where adverse effects are assessed.

Operation Phase
The magnetic field produced by the DC submarine cables will be calculated during the development of the final applications. The magnetic field will be assessed by experts to determine if any environmental impacts from the cables.

FACTORS TO ASSESS

Impacts which could be treated throughout the scoping phase and in the environmental assessment include:

- Environmental impacts
- Noise & vibration
- Archeological and historic items
- Visual impact (converter station)
- Electromagnetic Fields (EMF)
- Spatial planning and use of recreational areas
- Health and Safety

While the design of high voltage DC cables removes any external electric fields, electromagnetic fields are produced wherever electricity is used or transmitted. NGVL and Energinet.dk, in collaboration with consenting authorities, will ensure the safe operation of all the assets by complying with all appropriate independent safety standards such as the exposure guidelines recommended by the European Union.

Decommissioning
Viking Link has an expected life of 40 years. It is difficult therefore to predict the legislative frameworks that will apply to the decommissioning of offshore infrastructure. In most circumstances the impacts from the activities for the decommissioning will be comparable to the impacts from the construction phase and will be assessed at the time of decommissioning, and appropriate mitigation will be implemented where required.

Potential Impacts from Onshore Elements

Construction Phase
The construction phase has for the onshore elements in the UK and Denmark the potential for adverse impacts on the environment over a 2 to 3 year period. Although the impacts will be temporary Viking Link will undertake an assessment and include measures to either avoid or mitigate any adverse impacts.

Potential impacts from the installation of the cables through environmental areas, such as Natura2000 onshore areas in Denmark, will be assessed in close collaboration with the consenting bodies and appropriate mitigation measures will be proposed.

Several parts of the onshore elements could potentially affect wildlife protected by local legislation. By identifying appropriate mitigation measures regards to these, any impacts will be minimised.

Potential impacts from the onshore construction phase may also include impacts on the general public and local communities from traffic and construction noise in the area where the work is undertaken at the time. The Environmental Impact Assessment (EIA) will assess such impacts and propose mitigation measures where appropriate

Operation Phase
While the design of high voltage DC onshore cables removes any external electric fields, electromagnetic fields are produced wherever electricity is used or transmitted. NGVL and Energinet.dk, in collaboration with consenting authorities, will ensure the safe operation of all the assets by complying with all appropriate independent safety standards such as the exposure guidelines recommended by the European Union. The magnetic field produced by the DC cables will be similar in magnitude to the natural magnetic field produced by the earth.

We understand that the size and visual impact of the converter stations may be a concern for many. Viking Link will work with appropriate authorities to agree building design and materials and any local environmental mitigation that may be required.

Decommissioning
Viking Link has an expected life of 40 year. The legislative frameworks that apply at that time will be followed on how decommissioning of the onshore elements is required if it needs to be removed or recycled. In most circumstances the impacts from the activities for the decommissioning will be comparable to the impacts from the construction phase and will be assessed at the time of decommissioning, and appropriate mitigation will be implemented where required.

MITIGATION MEASURES

The project has and will continue to consider environmental constraints in any options identified for cable routeing, landfall point and converter station site, with the aim of avoiding designated areas where reasonably practicable. The options have and will be consulted with relevant authorities, statutory and nonstatutory consultees and communities before identifying preferences for routeing and siting.

In instances where the project interacts with environmental designations, through the Environmental Impact Assessment (EIA) or its' equivalent process, appropriate and proportionate mitigation measures will be identified and proposed as part of its permit applications

Project Timeline

We aim to be operational by 2022

2014

- Cooperation agreement between National Grid and Energinet.dk

2015

- Ofgem 'cap and floor' regulatory regime confirmed
- PCI status confirmation

2016

- Public consultations in Great British, Danish, German and Dutch territories
- Marine and onshore environmental surveys start

2017

- Consent applications submitted to National Competent Authorities and consenting / licensing bodies
- Licencing consent applications and consultations in Denmark, Germany, the Netherlands and Great Britain
- Consent and licences granted

2018

- Financial Investment Decision
- Construction Contracts Awarded

2019

- Start cable manufacture
- Commence construction and installation

2022

- Testing, commissioning and operating

Permit Process and Public Participation

Viking Link will comply with all appropriate national legislation and legislative framework for PCI projects to obtain the required permits.

For the British, Danish and Dutch territories, the Environmental Impact Assessment (EIA) or its' equivalent process will be followed. For the German territory the Competent Authority has advised that an EIA is not required. The legislative framework for PCI demands an equal level of stakeholder consultation and public participation.

Under the TEN-E Regulation, the permit granting process is split into two main phases – the preapplication and the statutory permit granting procedures.

Within the pre-application procedure, the project partners (NGVL and Energinet.dk) have to carry out at least one public event in each member state and the consultation shall take place within no more than two months from the commencement date of the first public consultation. In the period from June to August in 2016, the Viking Link project partners will be arranging these consultation events in all four territories covered within Viking Link in accordance with the Concept for Public Participation which is part of the requirements under the EU TEN-E Regulations.

Viking Link is undertaking an extensive scoping exercise on the project during the summer of 2016 and will liaise with all appropriate statutory and non-statutory consultees to inform this exercise. During this time, Viking Link will be looking at the factors to be assessed in the EIA, or its' equivalent and formulating agreement on the extent and methodologies.

Any input/feedback from the consultation phase will be taken into consideration in developing the scoping document as well as the project proposal and applications.

In accordance with the TEN-E Regulations, a consultation report will document how any input from any public and stakeholder engagement has affected the decisions in developing the project.
The permit process in each jurisdiction will ensure that any potential environmental impacts and input from the public consultations are taken into account in the decisionmaking processes which are likely to determine the conditions for consent. No form of construction works will commence before Comprehensive Decisions have been confirmed.

Read more about Viking Link

Recognising the need for multi lingual project information, Viking Link has established dedicated websites in Danish, German, Dutch and English.

The respective website addresses are provided below:

www.viking-link.dk (Danish)
www.viking-link.de (German)
www.viking-link.nl (Dutch)
www.viking-link.com (English)

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MANUAL OF PROCEDURES FOR TEN-E PROJECTS

Denmark:
/www.ens.dk/undergrund-forsyning/el-naturgas-varmeforsyning/pci-projekter-faelles-europaeisk-interesse

Germany:
www.bundesnetzagentur.de/cln_1421/DE/Allgemeines/DieBundesnetzagentur/Internationales/Energie/PCI/pci-node.html

The Netherlands:
www.rvo.nl/subsidies-regelingen/projecten-van-europees-belang

United Kingdom:
www.gov.uk/government/uploads/system/uploads/attachment_data/file/311184/uk_man

EU Commission transparency platform:
http://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest

Contact the Project Partners

National Grid

Phone: +44 (0) 800 731 0561
Open between 9am and 5pm (UK Local) Monday to Friday, an answerphone is available outside of these hours and messages left on the answerphone will be handled on the next working day.

Mail:
Vikinglink@ communityrelations.co.uk

Or write to us at:
FREEPOST VIKING LINK – no further address or stamp required (only from UK)

Energinet.dk

Phone: +45 70 10 22 44
Open between 8am to 4pm (CET) Monday to Friday

Mail:
Vikinglink@energinet.dk

Or write to us at:
Energinet.dk
Att: Viking Link
Tonne Kjærsvej 65
DK – 7000 Fredericia

If you, or someone you know, would like information in Braille, audio, large print or another language, please call us on the freephone number above.