



**NeuConnect**

# Non Technical --- Summary



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# 1. Introduction

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- 1.1** NeuConnect Britain Limited (“NeuConnect”) is developing a subsea and underground High Voltage Direct Current (“HVDC”) electricity link between the Isle of Grain in the south east of England and Wilhelmshaven in northern Germany (hereinafter “NeuConnect Interconnector”).
- 1.2** Due to its contribution to European energy policy objectives, including competitiveness, sustainability and security of supply, NeuConnect has been recognised as a ‘Project of Common Interest’ (PCI) and was granted PCI status in November 2020. The project has been prepared in accordance with the Trans-European Energy (TEN-E) Regulations.
- 1.3** NeuConnect Interconnector is being developed by an international, experienced consortium that includes Meridiam, Allianz Capital Partners on behalf of Allianz Group and Kansai Electric Power, with the project also supported by Greenage Power and Frontier Power as developers. The key partners bring a proven track record in delivering largescale energy infrastructure, creating a team with significant experience and expertise in interconnector projects.

## 2. Project Description

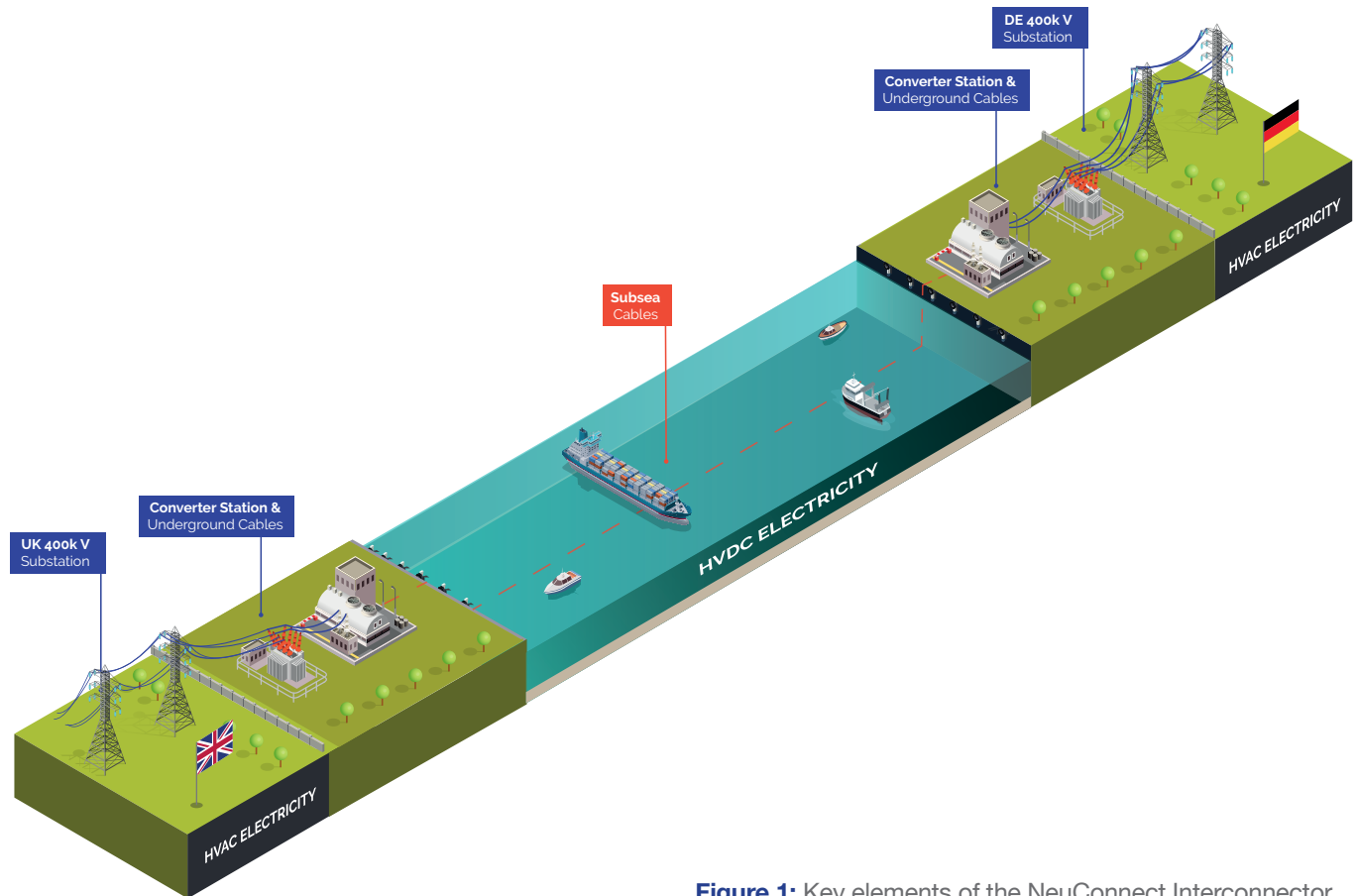
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- 2.1** NeuConnect Interconnector will create the first direct electricity link between Germany and Great Britain, connecting two of Europe’s largest energy markets for the first time.
- 2.2** Around 700km of subsea cables will form an ‘invisible highway’ allowing up to 1,400 Megawatts (1.4 Gigawatts) of electricity to move in either direction, enough to power tens of millions of homes over the life of the project.
- 2.3** NeuConnect Interconnector will deliver significant benefits to consumers, including greater security of supply, more resilience in energy networks, a contribution to carbon reduction and increasing choice and competition in the Great Britain and German electricity markets. Interconnectors also provide an important outlet for the excess power generated by renewable energy infrastructure by allowing this excess power to be rechannelled into markets where there is a demand.



## Project Elements

**2.4** NeuConnect Interconnector is an electricity interconnector consisting of two high voltage subsea cables and two high voltage underground cables connecting HVDC converter stations in Great Britain and Germany. Each converter station will convert electricity from alternating current (AC) to direct current (DC) prior to transmission, with the reverse process occurring when electricity is received. The main elements of NeuConnect Interconnector are displayed in Figure 1 below.



**Figure 1:** Key elements of the NeuConnect Interconnector

**2.5** The Great Britain and German electricity grids both use Alternating Current. Alternating current is an electric current, which reverses direction periodically. In contrast, DC flows in one direction and can be used to transmit electricity efficiently over long distances using high voltage (HV) cables. NeuConnect Interconnector will use high voltage direct current (HVDC) cables to link the converter stations at the Isle of Grain in Great Britain and Wilhelmshaven in Germany. Relatively short AC cables will connect the converter stations to substations, which are part of the national transmission systems of Great Britain and Germany.

**2.6** The main elements of NeuConnect Interconnector are described in more detail below. All information is indicative as all elements of NeuConnect Interconnector are in the design process and therefore may be subject to alteration.



## Offshore elements

**2.7** The offshore element of the NeuConnect Interconnector will link the Isle of Grain in Kent with Fedderwarden, near Wilhelmshaven, in Germany, with subsea cables travelling through British, Dutch and German waters. An indicative map of the proposed offshore cable route is shown below:



Figure 2: Proposed offshore cable route, for illustrative purposes

- 2.8** The two cables will be installed using a cable laying vessel or barge. Where possible, the subsea cables will be buried in trenches under the sea floor. Along the route the cables will need to cross other telecommunication and electricity cables and oil and gas pipelines. For these reasons it will not always be possible to install the cables beneath the seabed and in such situations the cables will be protected using alternative protection methods such as rock berms or concrete mattresses.
- 2.9** The high voltage subsea cables will be brought ashore at landfall locations in Great Britain and Germany. Underground Joint Transition Chambers (JTCs) will be required at each landfall location to bring the subsea cables ashore and connect them to DC cables that will run underground from the landfall location to the converter station.



## GB-only Onshore elements



- 2.10** At the Isle of Grain, Kent, two underground direct current ('DC') cables will run from the landfall location to a new Converter Station located approximately 2km inland.
- 2.11** A new substation is also being constructed to connect the NeuConnect Interconnector to the National Electricity Transmission System (NETS) for distribution across the existing network in Great Britain.
- 2.12** In addition to the underground cable route, some changes will need to be made to the existing pylons close to the converter station site. This may include an additional pylon close to the proposed new substation, or the relocation of the existing pylon currently located to the west of the proposed substation and converter station. Should this be necessary, the new pylon or the relocation of existing pylon may be relocated to within the area of work.

## GB and German Onshore elements

- 2.13** Converter stations are required in both Great Britain and Germany to convert electricity from Direct Current (DC) to Alternating Current (AC) and vice versa. Each converter station site will comprise a mix of buildings and outdoor electrical equipment and will have a maximum height of approximately 26m. Each site will be approximately 10 hectares (25 acres), although the actual converter hall will only occupy a small portion of the overall site.



### 3. Onshore Elements in Germany

The German onshore elements are comprised of the following:

- 3.1** A Landfall Location, where the high voltage subsea cables will be brought ashore to connect the offshore cables to the onshore cables, located at Hooksiel to the north of Wilhelmshaven;
- 3.2** Underground ('DC') cables running from the landfall location to the Converter Station;
- 3.3** Construction of a new Converter station, located in close proximity to the Fedderwarden substation, primarily comprising buildings containing specialist electrical equipment. The building roofline will vary in height, but will be approximately 26m at its peak; and Underground AC cables connecting the new Converter Station and Fedderwarden substation.
- 3.4** The locations of the German onshore elements of the project were largely arrived at as a result of the connection point designated by Tennet, the German transmission system operator.
- 3.5** Once the connection point was agreed to be located at Fedderwarden substation, NeuConnect considered possible locations for the Converter Station, landfall and routing of the onshore cable between the landfall and the converter station with the final locations influenced by engineering considerations and the availability and suitability of land in the vicinity of the Fedderwarden substation.



Figure 3: Project Area of German Onshore Scheme

## 4. Onshore Elements in GB

**4.1** In Great Britain the onshore components of the Project (the 'GB Onshore Scheme') extend as far as Mean Low Water Springs (MLWS). The location and planning application boundary (the 'Project Area') of the GB Onshore Scheme is illustrated in Figure 5 below.

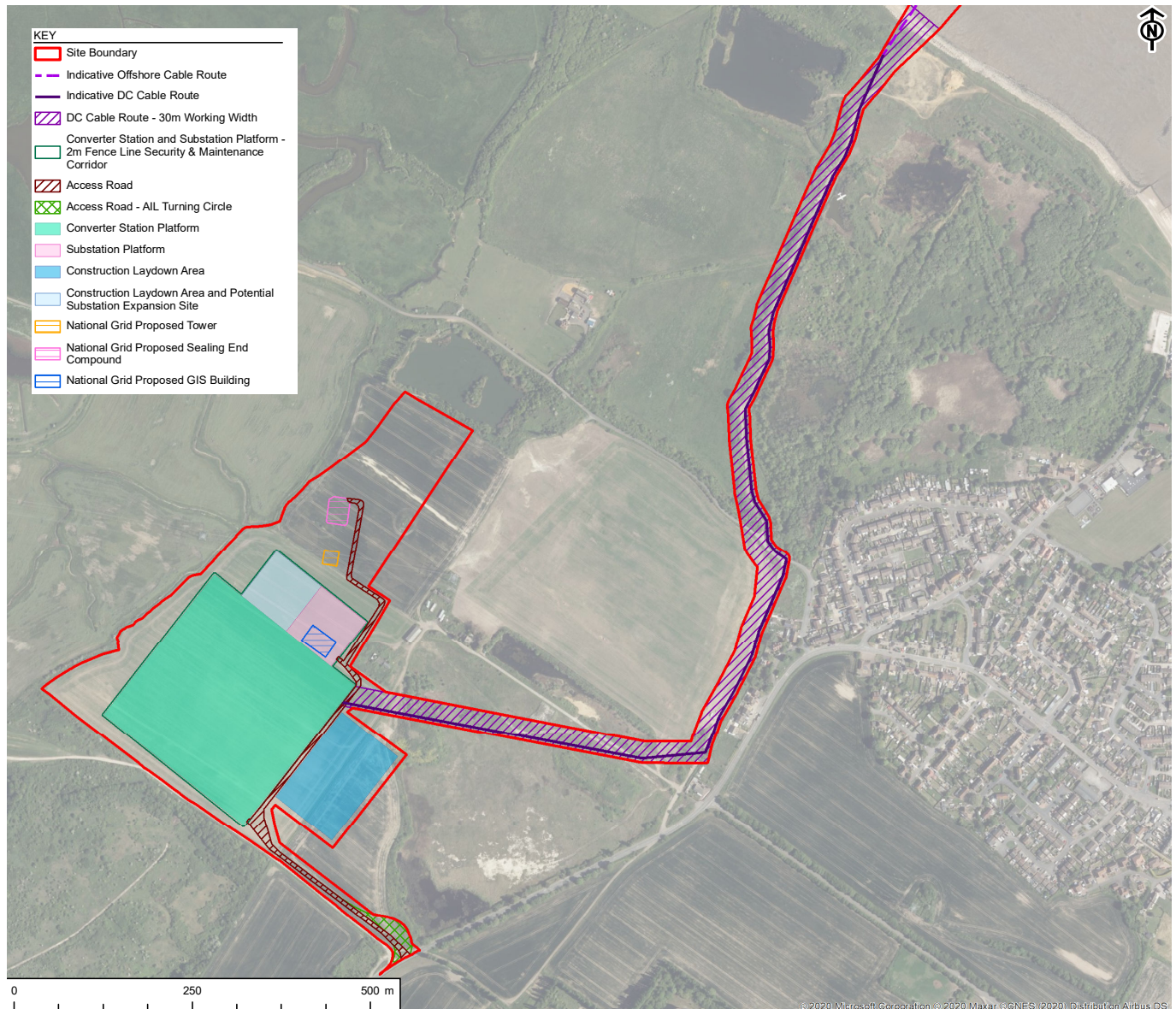


Figure 4: Project Area of GB Onshore Scheme



## 4.2 The GB Onshore Scheme will comprise the following main elements extending as far as MLWS:

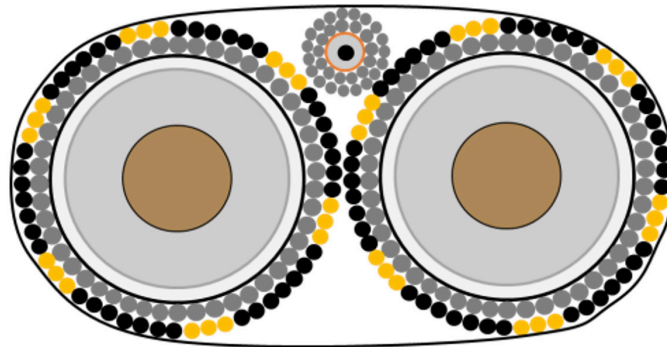
- Fenced cable sealing end compound;
- Substation within a fenced compound comprising a single building, some outdoor electrical equipment and an internal road for equipment access;
- Approximately 50 metre (m) long AC cable from the substation to the converter station. The AC cable may be either underground or above ground;
- Converter station within a fenced compound comprising buildings, some outdoor electrical equipment and internal access roads;
- Improvement works at the existing B2001 / Grain Road junction to provide access to both the proposed converter station and substation compounds;
- An approximately 1,550 m long underground DC cable route from the converter station to the landfall point;
- A Transition Joint Pit (TJP) at the landfall point where underground and subsea DC cables are joined together (subsea cables are slightly larger than underground cables due to additional protective armouring) and;
- An approximately 1,700 m long section of buried ducts for the subsea DC cables from the TJP and across the intertidal zone.
- Access to the GB Onshore Scheme will be taken from the existing junction on the B2001/Grain Road. The existing junction will be improved and a new approximately 850 m long permanent access road will be constructed. This will provide access to the proposed converter station and substation compounds and the cable sealing end compound.
- On the southern and western boundaries of the GB Onshore Scheme, boundary planting is proposed to better integrate the proposed converter station and substation buildings in to the existing landscape. These boundaries will comprise of native species which will also increase biodiversity and help screen or soften some views of the GB Onshore Scheme from viewpoints in the vicinity.
- To connect the Project to the electricity transmission system, there will be modifications required to the existing overhead line (OHL) which runs roughly east to west across the Isle of Grain.

## 5. Offshore Cable

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### Cable Design and configuration

- 5.1** Electricity will be transmitted using HVDC submarine cable technology through a closed circuit of two HVDC submarine cables installed in a single cable bundle also containing a fibre-optic control and communication cable as shown in Figure 6 below.



**Figure 5:** Two bundled HVDC cables with fibre optic cable.

- 5.2** The exact route for the cable bundle within the corridor will be confirmed by further detailed analysis of survey information, including additional pre-installation surveys and taking account of environment mitigations.

## 6. Consultation and Engagement

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### Approach to Consultation:

- 6.1** NeuConnect is committed to engaging with the local community and, following the submission of the application, will ensure that interested parties and key stakeholders remain informed and updated regarding the proposals.
- 6.2** All engagement and consultation activity undertaken takes into account NeuConnect's approaches to community engagement. These require public involvement activity to include:
- Explaining the project
  - Explaining the options and why here, and why now
  - Linking the project to the community
  - Explaining the benefits
  - Listening to feedback

### Public Participation and TEN-E Regulation

- 6.3** Under the TEN-E Regulation, developers are required to consult with all stakeholders and provide an opportunity for them to attend meetings, comment on proposals and discuss any concerns they may have on the project. NeuConnect have to carry out at least one public event in each member state and the consultation has to take place within no more than two months from the commencement date of the first public event. UK events have been held since Autumn 2018. Public consultations in Germany took place in August 2019.



## Project Website

**6.4** As well as attending public events, a project website (<https://neuconnect.eu/>) is available, and serves as a source of information for the project.

## Consultation in Great Britain

**6.5** Following the public information event, NeuConnect held two public consultation events to display its final proposals for NeuConnect Interconnector on **Thursday 20th June** between 4.00pm and 8.00pm, and on **Saturday 22nd June** between 11.00am and 4.00pm. Both events were held at Grain Village Hall, Chapel Road, Isle of Grain.

**6.6** A stakeholder preview was held between 3.00pm and 4.00pm, ahead of the event on **Thursday 20th June** for the Parish and Medway councillors, as well as interested community groups and stakeholders.

**6.7** An invitation newsletter was distributed to 2,120 households and businesses in the local area advising them of the proposals, and the public information event. The invitations were sent to those homes and businesses thought to be most affected by the proposals within the immediate vicinity and were distributed on **Thursday 6th June**. The following map illustrates the distribution area.

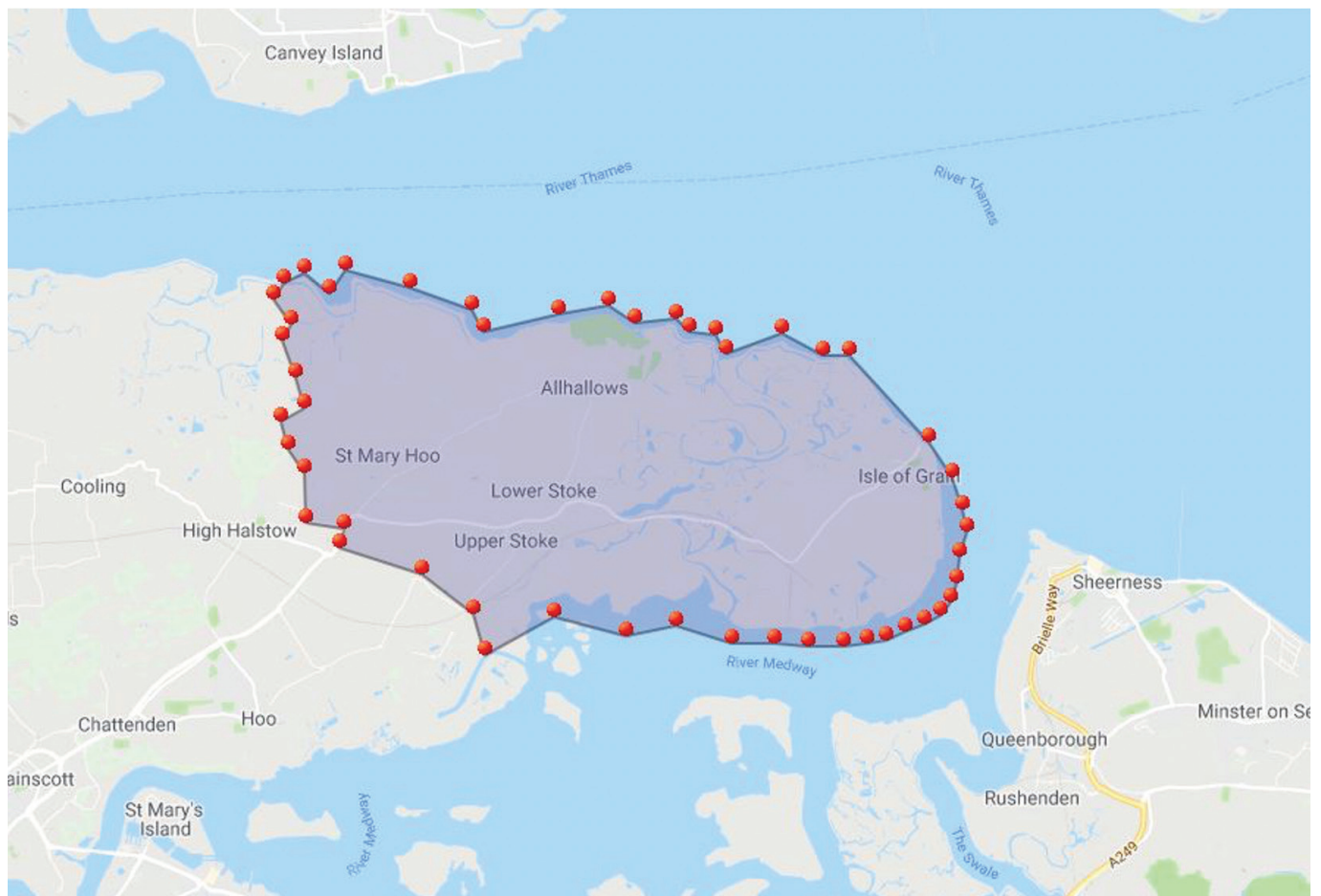


Figure 6: A map depicting the area targeted in the public consultation invitation newsletter distribution area

- 6.8** The A4 invitation leaflet contained the following:
- Information about NeuConnect;
  - Details of the public information event;
  - An overview of the proposals;
  - Background to the project;
  - Benefits;
  - Need for interconnectors; and
  - Contact details.
- 6.9** Copies of the invitation were also issued to a number of local stakeholders, including:
- Medway Council Cabinet members;
  - Medway Council Ward Members for Peninsula;
  - Local Parish Councils;
  - Kelly Tolhurst MP; and
  - A number of third-party groups based in the vicinity of Grain.

## Consultation in Germany

- 6.10** According to Art. 9 Para. 4 in conjunction with Annex VI, points 3, 5 and 6 of the TEN-E Regulation, the public must be involved at least once as part of the pre-application section. To implement this necessary public participation, a public information event took place on August 16, 2019 in the Hotel Atlantik in Wilhelmshaven. Copies of the invitation were also issued to a number of local stakeholders, including:
- The local press
  - Local City of Wilhelmshaven politicians
  - Local residents
  - Kreislandvolkverband Wesermarsch e.V. invited its members to the citizens' information fair.
- 6.11** The completed feedback forms were collected and their input was incorporated into the further planning. Around 60 visitors - including important NeuConnect stakeholders - attended the event.

# 7. Potential Impacts

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## Environmental Assessments

- 7.1** 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 have also informed this process.
- 7.2** All assessments consider potential effects 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.
- 7.3** Factors assessed include:
- Ecology
  - Noise & vibration
  - Archaeological and historic items
  - Visual impact (converter station)
  - Electrical and Magnetic Field (EMF)
  - Health and Safety
  - Water resources and flood risk
  - Transport and access
  - Ground conditions
- 7.4** Potential cumulative impacts including cross-boundary impacts have been assessed for each set of permit applications.



## Potential Terrestrial Impacts

- 7.5** NeuConnect is committed to delivering low-impact energy in a safe, secure and sustainable manner. A consideration and mitigation of environmental impacts has therefore been at the forefront of the project and great emphasis has been placed on maintain and enhancing green spaces for the future.

To understand the likely onshore impacts of the project, inform the design of the proposals and assess the need for potential mitigation measures, NeuConnect undertook an Environmental Impact Assessment (EIA). The findings of the EIA informed the Environmental Statement (ES), which was submitted to Medway Council alongside the planning application for the GB onshore elements.

The ES concluded that the majority of the potential impacts would be minor in nature, with a small number of potentially significant impacts on landscape character, unknown archaeological assets and users of West Lane.

NeuConnect has committed to full compliance with all appropriate independent safety standards such as the exposure guidelines recommended by the European Union. Findings have found that;

- 7.6** The construction phase for the onshore elements in the UK and Germany has been deemed to potentially lead to only temporary minor impacts and extensive mitigation measures have been implemented here.
- 7.7** There should be no significant cumulative effects on the landscape for the GB onshore scheme.
- 7.8** The process for the installation of cables through environmental areas in Germany have been assessed in close collaboration with the consenting bodies and appropriate mitigation measures will be proposed.
- 7.9** Impact on local wildlife has been deemed to be minor and extensive mitigation has been put in place and green spaces and opportunities for enhancement have been made a priority.
- 7.10** Construction traffic and construction noise in the area where the work is undertaken at the time should be minor and robust measures have been identified to mitigate these.
- 7.11** The chosen design of the high voltage DC onshore cables removes any external electric fields.
- 7.12** No significant effects to water resources and flood risk are expected during the operation of the GB Onshore Scheme assuming a suitable Flood Warning and Evacuation Plan is established.
- 7.13** The assessment of temporary effects of ground works has shown that there will be no significant impacts due to the groundworks of the project.

## Potential Marine Impacts

- 7.14** Extensive consideration has been applied to all aspects of the marine ecosystem and efforts have been made across the board to minimize impact. The EA concluded that no significant impacts will arise as a result of the construction and operation of the project. Where the potential for minor impacts to occur have been identified, NeuConnect has committed to a number of mitigation measures in order to further minimise the effects of these minor impacts.
- 7.15** Specifically, the team has found that changes to the seabed can be minimised where possible and that any disturbance or loss of habitat will be negligible.

## 8. Mitigation Measures

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### Best Practice and Mitigation

- 8.1** The environmental assessment process has identified Best Practice and project specific mitigation measures to be implemented during each phase of the project to avoid potentially adverse effects as well as reduce the significance of potential effects.
- 8.2** Mitigation Schedules have been prepared for each jurisdiction to support the permitting processes, and each schedule forms a list of measures the project will undertake to reduce impacts.
- 8.3** Extensive mitigation has been undertaken to address all core impact areas as discussed above. Adopting measures that comply with environmental protection legislation across construction and operation. Efforts to minimise adverse impact have been implemented across areas with much adverse impact being minimal to negligible. Full details are provided in the EA.

## 9. Permit Granting Process

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### Project Permits

- 9.1** Permits are required for both onshore and offshore works in Great Britain and Germany, and for offshore works in The Netherlands. The statutory permits include the following:

#### Great Britain

- Planning Permission under the Town and Country Planning Act 1990 for all elements above mean low water (i.e. above low tide).
- Marine Licence under Marine and Coastal Access Act 2009 for all elements below Mean High Water Springs to the UK/NL median line.

#### The Netherlands

- Water Permit (WATERVERGUNNING)
- Permit under the Act on Nature Conservation 2017 (Wet natuurbescherming)

#### Germany

- Federal Mining Act (Bundesberggesetz) - Authorisation for the laying of a submarine cable in accordance with paragraph 133 Section 1 Nr. 1 and 2 about underwater cables and transit pipelines
- Federal Act for the Protection of Nature - Exception or exemption in the context of the legal biotope protection and the species protection in accordance with § 30(3), § 45(7), § 67






### Permit Granting Schedule

- 9.2** The PCI process is co-ordinated within each Member State by a National Competent Authority (NCA) and the NCA for each country is as follows:
- UK – Marine Management Organisation (MMO) upon delegation from the Secretary of State for Energy
  - Germany – Federal Network Agency (Bundesnetzagentur)
  - Netherlands – Ministry of Economic Affairs
- 9.3** Each NCA is required to provide the project with a Permit Granting Schedule which accords to its obligations under the TEN-E Regulation.

# 10. Project Status

- 10.1** NeuConnect was granted Project of Common Interest (PCI) status by the European Commission in 2019
- 10.2** Projects of Common Interest (PCIs) are key cross border infrastructure projects that link the energy systems of different countries. They are intended to help these countries achieve key energy policy and climate objectives: including securing affordable, secure and sustainable energy for all citizens, and the long-term decarbonisation of the economy in accordance with the Paris Agreement.
- 10.3** A link to the European Commission's website which has more information on PCIs can be viewed at: <https://ec.europa.eu/energy/en/topics/infrastructure/projects-common-interest>. You can find out more by viewing the information leaflet prepared for our 2019 public consultation, available [here](#).
- 10.4** The project is currently awaiting UK planning approvals from both nations. A full indicative delivery timeline can be seen in the figure below.

## NEUCONNECT INDICATIVE DELIVERY TIMELINE

				
2018-19	2020	2021	2021-2023	2023-24
700km of seabed surveys completed  Major procurement process underway  Planning applications submitted in UK	German planning applications submitted  Netherlands planning applications submitted  Lands secured  UK planning approval expected	Final approval from Ofgem & German regulator expected  Financial Close & Contract Awards	Laying of sub-sea cables & construction of substations  Testing and commissioning of interconnector	Project completed & begins operation