



Introducing  
**DOGGER BANK D**  
**WIND FARM**  
WHERE ENERGY MEETS OPPORTUNITY

This is the first consultation on Dogger Bank D which opens on  
**Tuesday 26 September** and closes on **Tuesday 7 November 2023**.

[www.doggerbankd.com](http://www.doggerbankd.com)

# Introduction

**Dogger Bank D is a proposed new fourth phase of the Dogger Bank Wind Farm, the world's largest offshore wind farm.**

Located in the North Sea around 210km off the northeast coast at its closest point to shore, Dogger Bank D aims to generate renewable electricity from an offshore wind farm in support of the decarbonisation of the UK energy system.

Different opportunities are being explored in parallel to utilise the energy produced by Dogger Bank D.



## Electrical Transmission

Providing electricity for homes and businesses by linking to the transmission system, either via a connection into the UK national grid or a connection offshore to a wider coordinated network to Europe.



## Hydrogen Production

Producing hydrogen in a new large-scale onshore facility in the East Riding of Yorkshire to connect to a wider hydrogen network, for various potential uses such as the decarbonisation of energy-intensive industries in the Humber.

We will assess and progress these opportunities as part of the development process to give us the highest level of flexibility to deliver a sustainable, secure energy system.



Map of Dogger Bank A, B, C & D

## Dogger Bank D

Potential capacity: **Up to ~2GW\***

*\*This is an estimate of maximum capacity that will be subject to further technical studies*

Status: **Pre-application**



## Dogger Bank B

Capacity: **1.2GW**

Status: **Under construction**



## Dogger Bank A

Capacity: **1.2GW**

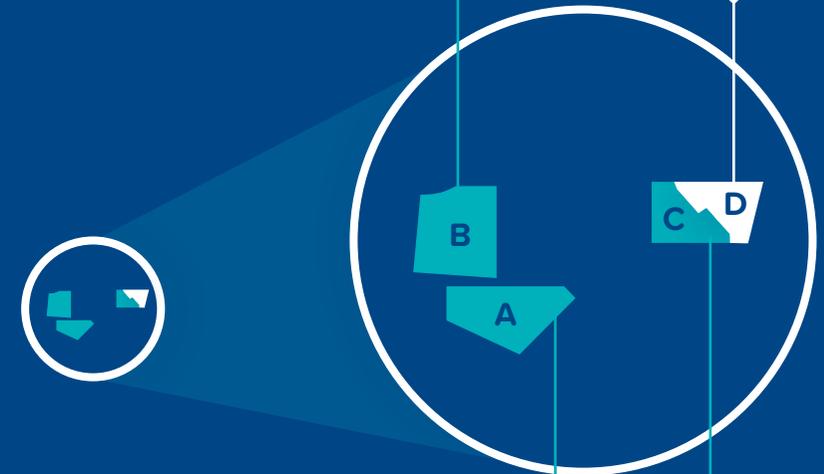
Status: **Under construction**



## Dogger Bank C

Capacity: **1.2GW**

Status: **Under construction**



# Welcome to our consultation

## This is the first phase of consultation for the Dogger Bank D Project.

This brochure provides information about the Project, including what work we have completed to date and what we'd welcome your feedback on.

We will hold a second phase of consultation in 2024, where we will continue to consult on our updated proposals.

Our consultation is open from Tuesday 26 September until Tuesday 7 November 2023. Details of how you can take part can be found on pages 19 and 20.

## The team behind Dogger Bank D

Dogger Bank D is being developed by a 50 / 50 joint venture between SSE Renewables and Equinor, two of the world's leading companies in the development and operation of offshore wind energy. Both companies were involved in the design and planning consent of Dogger Bank Wind Farm, the world's largest offshore wind farm.



SSE Renewables is a leading developer, owner and operator of renewable energy projects and assets across the UK and Ireland with a portfolio of around 4GW of operational offshore wind, onshore wind and hydroelectric sites. SSE Renewables has 13GW of upcoming projects in development, including the largest amount of offshore wind developments in the UK and Ireland totalling over 6GW.



Equinor has a long track record of developing offshore wind farms in the UK, having already built and commissioned into operation Sheringham Shoal Offshore Wind Farm, Dudgeon Offshore Wind Farm and Hywind Scotland, the world's first floating offshore wind farm. Equinor has been operating in the UK for 40 years and possesses over 50 years of offshore experience in the North Sea area.

## Dogger Bank Wind Farm

The first three phases of Dogger Bank Wind Farm are a joint venture between SSE Renewables, Equinor and Vårgrønn. They will be located more than 130km off the Yorkshire coast and will generate enough renewable energy to power up to six million homes annually.\*

Onshore construction began in 2020 and is now underway for all three phases, while offshore construction on Dogger Bank A began in Spring 2022. Dogger Bank Wind Farm will use one of the world's most powerful offshore wind turbines in operation today and will be the first wind farm in the UK to utilise a High Voltage Direct Current connection. Moreover, the construction and future operation of Dogger Bank Wind Farm will support over 2,000 new jobs in the UK, enhancing the country's supply chain opportunities to compete in the global offshore wind sector.

SSE Renewables is leading on the construction across all three phases and Equinor will operate Dogger Bank Wind Farm on completion.

*\*6 million homes powered per annum based on Typical Domestic Consumption Values (Medium Electricity Profile Class 1, 2,900kWh per household; OFGEM, January 2021), typical 55% wind load factor, and projected installed capacity of 3.6GW.*

# Dogger Bank D – the Project so far

**An announcement was made in February 2023 that Dogger Bank D was being explored as a proposed new fourth phase of the Dogger Bank Wind Farm, maximising the capacity of the eastern portion of the original Dogger Bank C area.**

In April 2023, the Project prepared a Scoping Report and received a Scoping Opinion adopted by the Planning Inspectorate on behalf of the Secretary of State for Energy Security and Net Zero in June 2023. You can view a copy of these documents on the Planning Inspectorate's website [www.infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/dogger-bank-d-wind-farm](http://www.infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/dogger-bank-d-wind-farm).

Through the development and construction of the wider Dogger Bank Wind Farm construction phase, the Dogger Bank D team already has a significant amount of data and understanding of the offshore area. We are using this data to inform and expand the development of Dogger Bank D alongside new offshore and onshore surveys.

We are working closely with The Crown Estate who manage the seabed around England, Wales and Northern Ireland, to agree the progression of Dogger Bank D.

## Our ambitions for Dogger Bank D

Dogger Bank D is being developed at a crucial time for the UK's energy sector. With advancements in offshore wind technology, the power from homegrown, clean renewables has the potential to ensure the UK can transition to a secure and affordable energy system.

As developers we have a proven track record in responsible delivery and innovation, and we believe that Dogger Bank D can make a considerable contribution to the UK's energy sector. With ambitious UK Government Net Zero targets and transformational national infrastructure upgrades, it's important that the Project progresses opportunities in parallel which can be pursued alongside the demands and opportunities of a changing energy landscape.



The UK Government is aiming to increase offshore wind capacity to

**50GW**

by 2030.

**BY 2035**

the UK Government targets a complete decarbonisation of the electricity system, resulting in electricity Net Zero.

## The energy landscape

The UK is transforming its energy system, building more network infrastructure for electrical transmission and accelerating its journey towards Net Zero.

An important part of this is the Holistic Network Design (HND), a recommended offshore and onshore design for a 2030 electricity network produced by the Electricity Systems Operator. It aims to integrate offshore wind power and accelerate the network needed to get energy to where it is needed across Great Britain.

Another important factor in the energy landscape is decarbonisation and how the emergence of a hydrogen economy in the UK can support this and hence contribute to Net Zero ambitions. Because of the UK's geology, infrastructure and technical expertise, a hydrogen economy could become a sector in which the UK is well placed to become a global leader.

By 2030 the UK is aiming for at least

**5GW**

of hydrogen produced by water electrolysis.

# Dogger Bank D offshore facts



**Up to 128 wind turbines**  
with associated support structures  
and foundations fixed to the seabed



**210km distance to shore**  
at its closest point, off the northeast  
coast of England



**262km<sup>2</sup>**  
is the offshore array area in which the wind turbines are located



**Up to six offshore platforms**  
with associated support structures and foundations fixed to the seabed, to facilitate the export of electricity to an onshore or offshore connection point



**Up to six subsea cables**  
for electricity transmission



**A network of subsea cables**  
linking the individual wind turbines to each other  
and to the offshore platforms

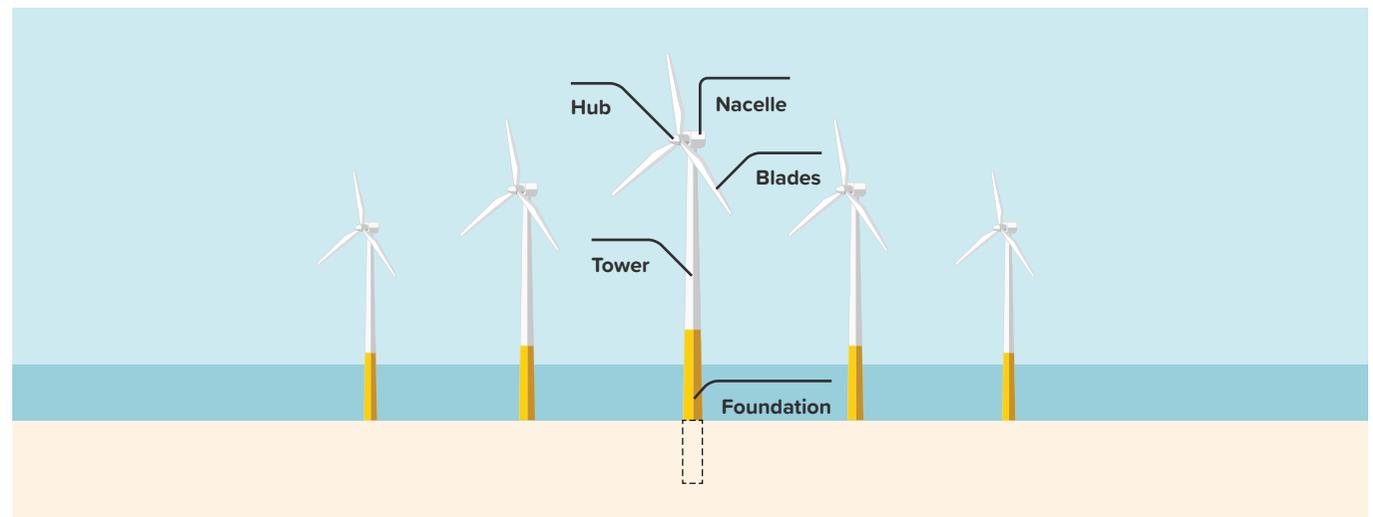


## Creating energy from offshore wind

Offshore wind power is the energy taken from the force of the winds out at sea and transformed into electricity.

Offshore wind turbines, positioned within an offshore array area harness the energy from the wind and transforms it into electricity which is then distributed via a network of subsea cables.

The key components of an offshore wind turbine are illustrated below.



## The Project development process

As part of the project development process we are assessing technical and environmental considerations to ensure opportunities for using the energy generated by the turbines can be built safely and with due consideration of any potential environmental impacts. We are gathering data, engaging with stakeholders and potential landowners and undertaking offshore and onshore surveys which all help us to understand the natural environment and what matters to those affected by our proposals.

We will use the information from our assessments to inform and develop our proposals alongside feedback received from all stages of consultation.

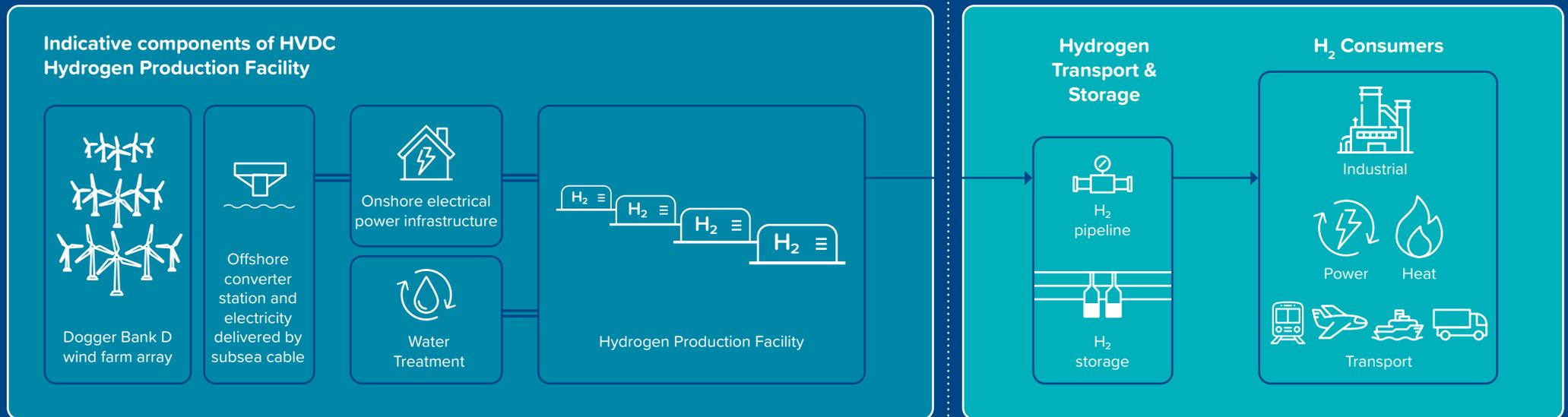
As project development is a lengthy process, we will speak to our statutory consultees on a regular basis to get their views at various stages of the design of our proposals and feedback design changes.

# Dogger Bank D – producing hydrogen to support decarbonisation

We are exploring an opportunity to use the electricity generated by Dogger Bank D to produce carbon-neutral green hydrogen by splitting water via electrolysis into hydrogen and oxygen.

This could provide a safe and sustainable way to replace fossil fuels used in energy-intensive industries such as steel and chemicals and in transport such as heavy goods vehicles, ships, and planes.

## Dogger Bank D Hydrogen Production Value Chain



Dogger Bank D proposals

Proposals separate from Dogger Bank D

## What is hydrogen?

Hydrogen is the most abundant chemical substance in the universe and it can play a revolutionary role in the route to Net Zero carbon emission targets.

When used as a fuel, hydrogen only emits water vapour into the atmosphere in contrast to petrol, diesel and natural gas which all produce harmful carbon dioxide emissions.

As a replacement for fossil fuel reliant processes used in the steel and chemicals industries and in difficult to electrify transportation such as tankers, hydrogen offers a more sustainable way to operate. Hydrogen also offers a way to transfer variable wind energy into storable clean energy, an important factor in providing energy security and flexibility.

Hydrogen created through renewable power is called green hydrogen.

## Making hydrogen through water electrolysis

Electrolysis describes the process of an electrical current flow through a liquid which causes chemical changes. At the very simplest level, to produce hydrogen through electrolysis you pass electricity through water (the liquid) and this process will split the water molecule ( $H_2O$ ) into the component parts of hydrogen ( $H_2$ ) and oxygen ( $O_2$ ).



## Selecting where to locate the hydrogen infrastructure for Dogger Bank D

We have undertaken a rigorous exercise of site selection underpinned by a series of site selection design principles and engineering requirements. The work to date has resulted in the refinement of a wider onshore area to two shortlisted broad locations that we have called “Aldbrough” and “Saltend”.

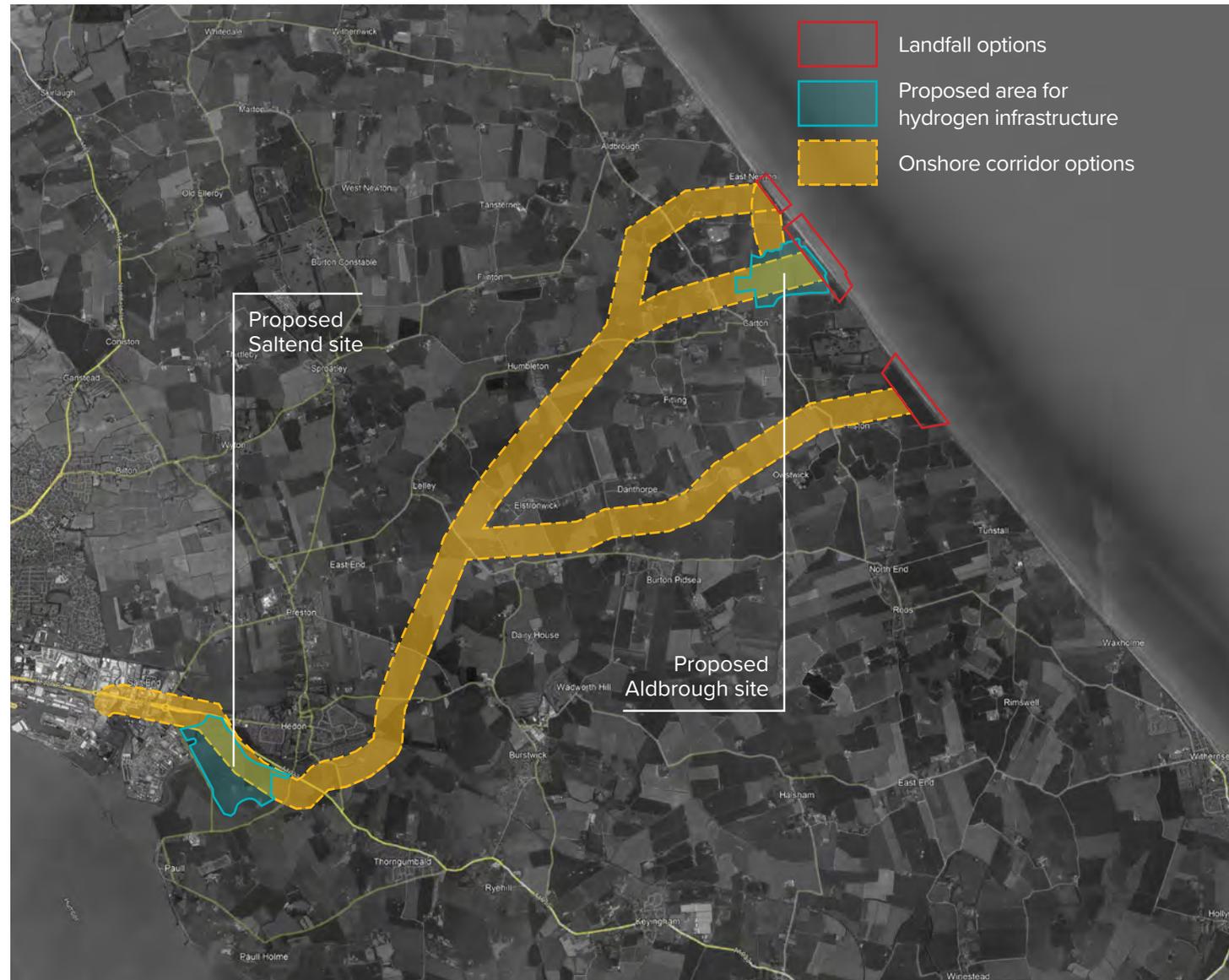
The site at Aldbrough is within an area south east of the existing Aldbrough Gas Storage plant. The site at Saltend lies within the Humber International Enterprise Park. It is currently expected that the total footprint of the site for the Hydrogen Production Facility will be around 55 hectares, subject to further design.

We sought to find the most direct corridors where the connecting infrastructure could be buried below ground from the landfall options to the Hydrogen Production Facility so as to reduce technical and environmental risks. Three potential landfall sites along the Holderness coast have been identified.

One site will ultimately be selected to locate the Hydrogen Production Facility itself whilst associated infrastructure may be required at both sites to support the operation of the facility.

As part of our site selection process we will consider the outcomes from ongoing feasibility studies alongside feedback from this first stage of consultation to ensure the appropriate areas for the Hydrogen Production Facility and associated infrastructure are identified and to take forward further refinements where possible.

### Hydrogen opportunity: proposed onshore areas



Design of the Hydrogen Production Facility will be developed following completion of concept and feasibility studies. The key components of the infrastructure associated with the Hydrogen Production Facility are expected to include:

<p><b>Electrical infrastructure</b></p>	<p>Energy from Dogger Bank D is received at an onshore converter station and converted from direct current (DC) to alternating current (AC) electricity. Additional electrical infrastructure needed at the onshore site includes a substation and stability equipment, including a back up generating station, electrical storage and other substation equipment.</p>
<p><b>Water supply and treatment system</b></p>	<p>The production of green hydrogen will require large quantities of very pure water. We are investigating a variety of possible water source options including potable water, recovering and reusing water from wastewater (water recycling) and turning seawater into freshwater (desalination). The eventual solution for the Project could include one or a selection of these options.</p>
<p><b>A hydrogen production system (electrolysers)</b></p>	<p>Electrolyser stacks are the main component within the hydrogen production system, and these are typically housed in buildings and containers. Additional key infrastructure includes cooling equipment, gas separation and purification equipment, compression systems and electrical distribution and rectification equipment as well as other auxiliary systems.</p>

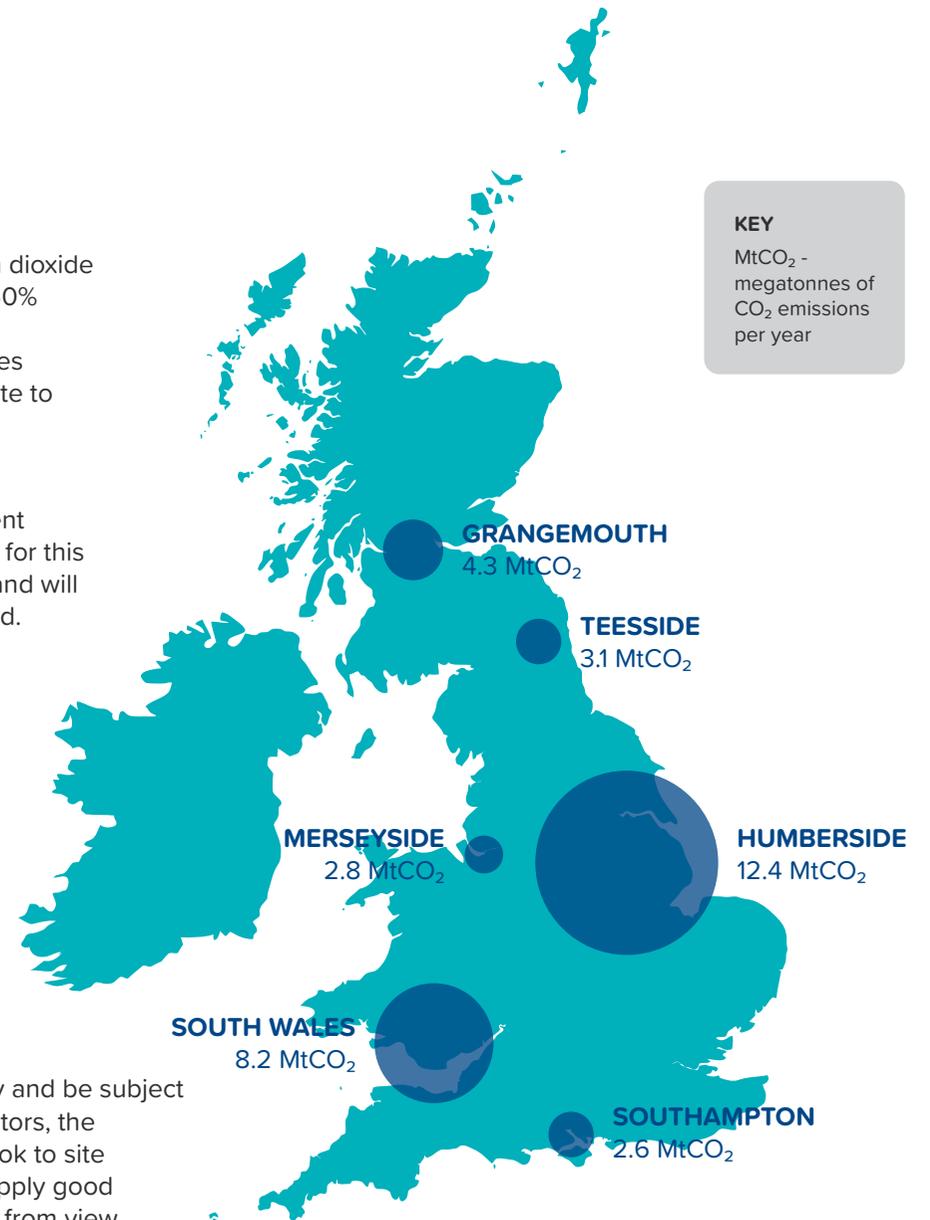
## The wider Humber region

The Humber region emits more carbon dioxide than any other UK industrial cluster – 50% more than the next largest – providing opportunities for a number of companies including Equinor and SSE to collaborate to achieve large-scale decarbonisation.

The onward distribution of the green hydrogen produced is a key requirement to reach consumers. The infrastructure for this network is not part of Dogger Bank D and will require further projects to come forward.

## Handling hydrogen safely and responsibly

When handled responsibly, green hydrogen is less dangerous than other flammable fuels such as petrol and natural gas that we rely on today. SSE and Equinor are specialist and safe operators of gas-based plants with long established safety records. The design of the Hydrogen Production Facility will have safety as a key priority and be subject to strict safety criteria set by the regulators, the Health and Safety Executive. We will look to site the facility and its elements carefully, apply good design principles and seek to screen it from view as much as possible.



The UK's largest industrial clusters by emissions  
Source: Zero Carbon Humber

# Dogger Bank D - delivering renewable electricity

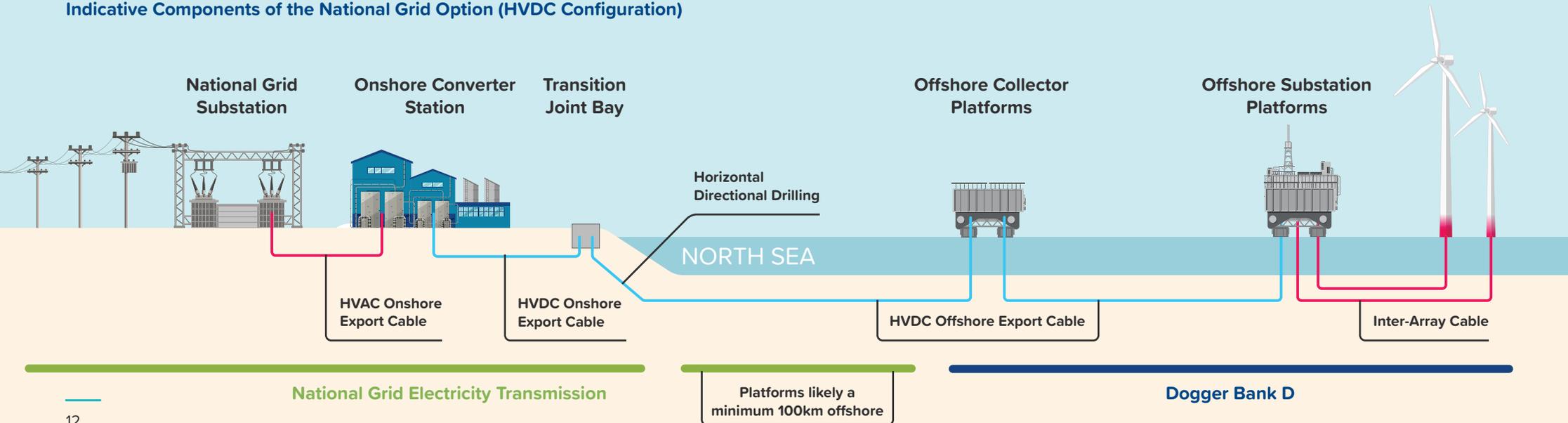
**We are also exploring an opportunity in parallel to the hydrogen production opportunity, to bring the energy from Dogger Bank D to an offshore connection point approximately 130km from the coast, from which National Grid Electricity Transmission (NGET) will provide an onward connection for the electricity to directly enter the national grid.**

This will require a separate planning application by NGET for the onward offshore connection to a point onshore and associated infrastructure such as an onshore substation and cables.

This opportunity is part of the Holistic Network Design (HND), National Grid's plans to support the large-scale delivery of electricity generated from offshore wind, taking power to where it's needed across Great Britain (see pages 4 and 5 to find out more). The HND supports the connection of 23GW of offshore wind power and the Government's ambition for 50GW of offshore wind capacity by 2030.

The various components of the possible direct connection into the national grid are shown below in the two figures. We could use different ways to transmit electrical power through cabling, these are High Voltage Direct Current (HVDC) and/or High Voltage Alternating Current (HVAC).

Indicative Components of the National Grid Option (HVDC Configuration)



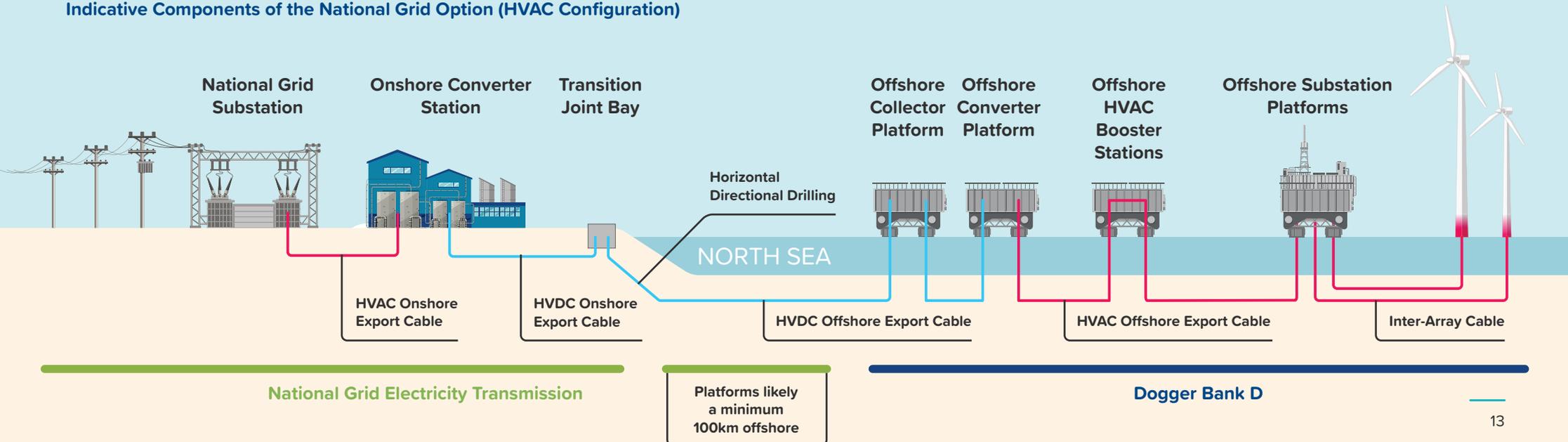
## Emerging opportunities

The North Sea is already a powerhouse for green energy production, but it could also become a hub to increase energy security for the UK. The development of Dogger Bank D could be coordinated with an interconnector between the UK and another country's electricity market to form a multi-purpose interconnector. This would potentially allow the more efficient use of offshore electrical infrastructure, reducing the need to curtail wind farm output in periods of oversupply in the UK, and thereby reducing costs for consumers.

We are exploring the opportunity to combine the production of green hydrogen with a connection to the national grid using the energy produced by Dogger Bank D.



### Indicative Components of the National Grid Option (HVAC Configuration)



# How we look to protect and enhance the environment

**Protecting and enhancing the habitats we operate in as we harness the wind for renewable energy generation is a key part of developing our proposals.**



We will be actively assessing the offshore and onshore environment and undertaking an Environmental Impact Assessment (EIA). This is an important part of the pre-application process and informs how the environment will be protected during the construction, operation and decommissioning phases.

We will be looking at ways to keep disturbance to people and wildlife to a minimum, such as the route of the cables avoiding residential areas, minimising impacts on the natural surroundings, road traffic disruption and tourist destinations.



## What we will assess offshore

- Marine Physical Processes
- Marine Water and Sediment Quality
- Benthic and Intertidal Ecology
- Fish and Shellfish Ecology
- Marine Mammals
- Intertidal and Offshore Ornithology
- Commercial Fisheries
- Shipping and Navigation
- Aviation, Radar and Military
- Archaeology and Cultural Heritage
- Other Marine Users



## What we will assess onshore

- Soils and Land Use
- Geology and Ground Conditions
- Noise and Vibration
- Ecology and Nature Conservation (including Ornithology)
- Air Quality and Dust
- Landscape and Visual Impact
- Archaeology and Cultural Heritage
- Water Resources and Flood Risk
- Traffic and Transport



*Common seal*

Field of Rapeseed, near Paull,  
East Yorkshire



To gain feedback on the assessment, a draft EIA will be drafted and presented in the form of a Preliminary Environmental Information Report (PEIR) for our next consultation in 2024. This assessment will represent a point in the assessment process when the design of the Project is still in development and the likely significant effects are continuing to be understood.

Feedback on the PEIR will be fed into the final EIA which will be documented in an Environmental Statement.

In addition to an EIA, a Habitats Regulations Assessment (HRA) will be produced to consider our impact on the Dogger Bank Special Area of Conservation and relevant Special Protected Areas. We will progress the development of information to support the HRA process in consultation with Statutory Nature Conservation Bodies and relevant stakeholders, including where steps have been taken to avoid, reduce or mitigate impacts.

The marine environment is important for Dogger Bank D as we will be applying for marine licences within the Marine Conservation Zones of Holderness Offshore and Holderness Inshore.



## What we will assess as project-wide topics

- Climate Change
- Socioeconomics, Tourism, and Recreation
- Major Accidents and Disasters
- Human Health

Water vole



Adder



# The planning application process

**As Dogger Bank D is recognised as a strategic national asset for energy with an expected generating capacity greater than 100MW, it qualifies as a Nationally Significant Infrastructure Project (NSIP).**

We will follow the procedures set out in the Planning Act 2008 which provides the framework for how NSIPs are developed.

We will apply to the Planning Inspectorate, an agency responsible for managing the NSIP planning process on behalf of the Secretary of State for Energy Security and Net Zero, for permission to build and operate Dogger Bank D.

You can see where you will have the chance to comment on our proposals and the project milestones in the timeline below.

## Timeline

The timescales for these milestones are indicative.



## Your part in the process

Your feedback is an important part of the process that will help us to develop the Project and inform how we build and operate Dogger Bank D. For this first phase of consultation, we are asking for your feedback on any part of the Project and particularly the proposed sites for the Hydrogen Production Facility and the proposed landfall points and corridors (please see the map on page 10). This can include ideas and suggestions to reduce or mitigate impacts during construction and operation.

You can provide feedback using the survey form available online, at the Community Access Point or at the information events. You can email or post us a letter.

## Reviewing consultation responses

After our consultation closes on **Tuesday 7 November 2023**, we will review all of the feedback we have received and update our proposals.

Feeding back on our review of your responses is an important part of the consultation process so we will provide summaries of the key topics from the consultation response, how we have considered them and any changes we have made as a result.

You will have another opportunity to provide your views on the updated proposals and the Preliminary Environmental Impact Report at our next consultation in 2024. Register on the website to receive email updates on the Project.

## Summary of our proposals

### For hydrogen production at Aldbrough

In addition to a site for a Hydrogen Production Facility within an area south east of the existing Aldbrough Gas Storage plant, two landfall options and one corridor are being considered.

### For hydrogen production at Saltend

We have identified a site for the facility within an area located on the Humber International Enterprise Park and we are looking at three corridors and three landfall options.

### Corridor options

The corridor options shown on page 10 provide a general indication of a potential route for where we could locate a cable and/or a pipeline below ground. The corridors have a broad width of 500m and the longest corridor is 16km. We will develop a preferred route once we have chosen a corridor. The route would be located within a working width of 150m to allow safe construction and installation.

One site will ultimately be selected to locate the Hydrogen Production Facility itself whilst associated infrastructure may be required at both sites to support the operation of the facility.

### Offshore

There could be up to 128 turbines located in an area of 262km<sup>2</sup>. The nearest wind turbines will be situated approximately 210km offshore from the northeast coast of England at the nearest point.

# The consultation process

The Planning Act 2008 sets out a list of statutory consultees such as Natural England, the Environment Agency, East Riding of Yorkshire Council who are known as statutory bodies and other stakeholders who have to be consulted on our proposals.

The local community and potential landowners are another important group who can provide useful information and influence the design of our Project.

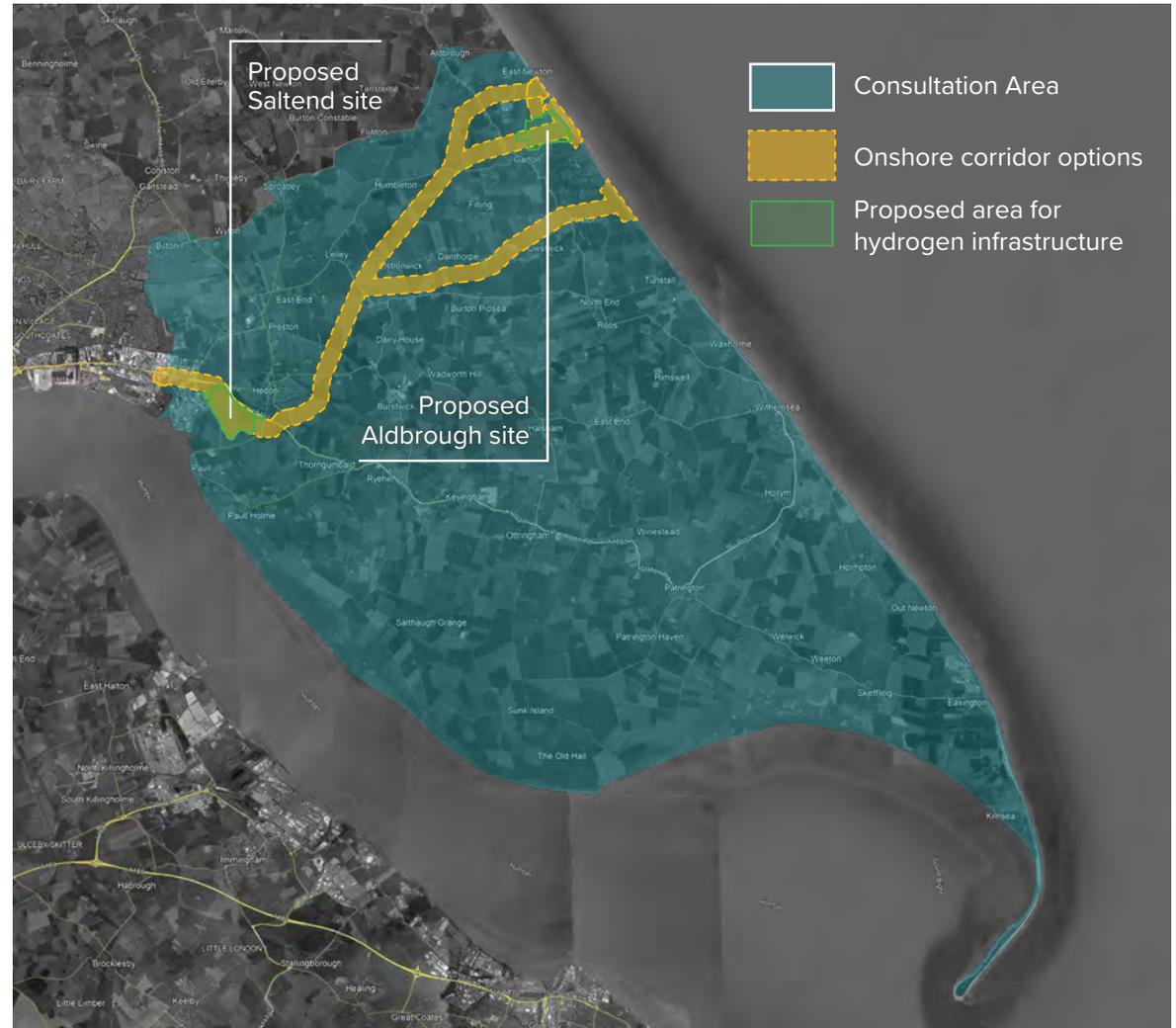
We understand and recognise the impact that the development Dogger Bank D could have on residents, businesses and those who come to the local area especially during construction. In order to publicise our consultation as widely as possible, we have established a consultation zone which, at a regional level, recognises the potential for impacts on the wider road network across Holderness as well as the proposed development of a Hydrogen Production Facility.

We are posting leaflets to over 19,000 households and businesses in this zone to inform them about the Project, encouraging local interest groups to engage with us and advertising the consultation in local media and online channels.

## Provide your views on our proposals

This first phase of consultation on Dogger Bank D starts on Tuesday 26 September and ends on Tuesday 7 November 2023.

During this consultation, we want to find out what part of our proposals matter to you. It could be for example that you want to know about the offshore studies we are doing, how we selected the possible sites for the Hydrogen Production Facility, the types of environmental assessments we are undertaking or the opportunities to get involved in the construction, maintenance and operation of the Project.



Consultation zone plan

## Come and meet us in person or join our webinar

We are hosting four information events open to anyone who may be interested in or in any way feels impacted by the Project. These will give everyone a chance to view information, speak to the project team and provide feedback on our proposals. For those not able to attend, you can register for an online webinar which will be recorded and uploaded to the Project website for later viewing.



**Saturday 7 October from 10am - 2pm**

Beverley Memorial Hall, 73-75 Lairgate,  
Beverley HU17 8HN



**Tuesday 10 October from 12pm - 5.30pm**

Hull City Hall, Mortimer Suite, Queen  
Victoria Square, Kingston upon Hull HU1 3RQ



**Wednesday 11 October from 2pm - 7pm**

Alexandra Hall, St Augustine's Gate,  
Hedon HU12 8EX



**Thursday 12 October from 2pm - 7pm**

Aldbrough Village Hall,  
Garton Road, Aldbrough HU11 4QA



**Thursday 19 October from 6pm - 7pm**

Online webinar and Q&A – register at  
[www.doggerbankd.com](http://www.doggerbankd.com)

## View our documents

From Tuesday 26 September 2023, all consultation documents (a brochure, maps and survey form) will be available for download at [www.doggerbankd.com](http://www.doggerbankd.com). You can fill in the survey form online and leave feedback on a specific location on the interactive consultation map.

You can view and pick up copies of the brochure, maps, survey form and an envelope to return the form back to us from the Community Access Points below. Please check opening times before your visit.

- Beverley Customer Service Centre, 7 Cross Street, Beverley HU17 9AX
- Hedon Library and Customer Service Centre, 31 St Augustine's Gate, Hedon HU12 8EX
- Hornsea Customer Service and Library, Broadway, Hornsea HU18 1PZ
- Withernsea Centre, Queen Street, Withernsea, HU19 2HH

Email or call us for a copy of the materials to be sent to you. If you would like materials in an alternative format (such as large-print, alternative language or Braille), please get in touch.

## What matters to you, matters to us

You can help shape our proposals for Dogger Bank D by telling us what matters to you and your local community. This includes ideas to reduce or mitigate impacts during construction and operation or to tell us what matters to you so we can shape our proposals around your community. Use the survey form, email or post us your thoughts and we will assess and explore all ideas.

Ideas and suggestions that we take forward will be captured as a commitment in the Dogger Bank D Commitments Register.

# Contact us

We welcome your feedback and have provided a number of ways for you to respond to this consultation and contact us.



Visit our website:  
[www.doggerbankd.com](http://www.doggerbankd.com)



Send us an email:  
[contact@doggerbankd.com](mailto:contact@doggerbankd.com)



Call our Freephone information line:  
**0800 254 5029**



Write to us:  
**FREEPOST DOGGER BANK D**

## To stay in touch

Sign up to receive email updates by registering your details on the website.

## Other contact details

If you are a landowner with related queries, please contact our land agents **Dalcour Maclaren**.

**Address:** Unit 1, Staplehurst Farm, Wester on the Green, Bicester OX23 3QU

**Contact:** Jenny Bennett

**Email:** [DBD@dalcourmaclaren.com](mailto:DBD@dalcourmaclaren.com)

**Telephone:** 07551 553539

If you are from the fisheries industry please contact our fisheries consultants **Brown & May Marine Ltd**.

**Address:** Progress Way, Mid Suffolk Business Park, Eye, Suffolk IP23 7HU

**Contact:** Sarah Richardson

Alex Winrow-Giffin

**Email:** [Sarah.Richardson@brownmay.com](mailto:Sarah.Richardson@brownmay.com)

[Alex@brownmay.com](mailto:Alex@brownmay.com)

**Telephone:** 07721 344354

07760 160039

**DOGGER BANK D**  
**WIND FARM**

