HORNSEA PROJECT THREE OFFSHORE WIND FARM

Briefing and Q&A Session with South Norfolk Parish Councils







DONG Energy at a glance

- Headquarters in Denmark
- 6,200 employees (including Oil & Gas)
- Revenue in 2016 DKK 61.2 bn
- EBITDA in 2016 DKK 19.1 bn
- Phase out the use of coal by 2023



• Develops, constructs, owns and operates offshore wind farms in Denmark, Germany, the Netherlands and the UK.

Development projects in Taiwan and the USA

4%^{*} Bioenergy & Thermal Power

 Generates and sells power and heat to customers in Denmark and Northwestern Europe

4%* Oil & Gas

(discontinued operations)
Produces oil and gas from fields in Denmark, Norway and the UK

12%^{*} Distribution & Customer Solutions

 Power distribution grid on Zealand and sale of power and gas to customers in Northwestern Europe





Hornsea 3 Offshore Wind Farm

Significant transformation of DONG Energy over the past decade



1. Excluding unallocated capital employed on DONG Energy group level

Hornsea 3 Offshore Wind Farm



DONG Energy Wind Power overview



DONG Energy in the UK

DONG Energy entered the UK in 2004, and has invested over £6 billion to date, with a further £6 billion investment expected by 2020.

- The UK is our largest market, with eight operational wind farms and a further four under construction.
- By 2020, when all of our current offshore wind farms are constructed, our UK fleet will be capable of meeting the average daily needs of over 4.4 million UK homes.
- Our UK offices and operations & maintenance facilities are spread across the UK, with a strong presence in east Irish Sea and Humber;
 - London
 - Barrow-in-Furness
 - Grimsby
 - Liverpool
 - Ramsgate
 - Brightlingsea





The current installed capacity of DONG Energy's offshore wind farms in the UK has the potential to power almost

2 million UK households each year. 1

<u>****</u>

DONG Energy is rapidly expanding in the UK. With fewer than ten employees in 2004, we have grown to over





Our offshore wind farms in the UK are helping to offset UK $\rm CO_2$ emissions. The emissions saved by the electricity currently generated from our offshore wind farms equates to taking

1.8 million cars off UK streets for one whole year.²



1 We have based this on a load factor of 42% and a household consumption of 4.1MWh per year.

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2 This figure assumes a load factor of 42%, and a CO2 emissions factor of 430g CO2/ kWh and an emissions saving per car of 1909 tons CO2 / year.



DONG Energy is currently exploring the potential to build one of the world's largest offshore wind farms

DONG Energy is proposing to develop a new offshore wind farm, in the North Sea, over 120 km off the north Norfolk coast.

- The Project will have a total generating capacity of up to 2,400 MW. Hornsea Project Three has signed a grid connection agreement with National Grid based on an onshore connection point at the existing 400 Kv Norwich Main National Grid Substation, located just south of Norwich.
- The Project has identified a suitable landfall zone in the vicinity of Weybourne and is currently consulting on an indicative export cable corridor.
- If built out to full capacity, Hornsea Project Three could be the world's largest offshore wind farm, capable of meeting

the average daily needs of well over 2

million UK homes.







We have based the above calculation on a load factor of 42% and a household consumption of 4.1MWh per year. Source: DECC, 2015



The Planning Process – pre-application consultation

As the proposed generating capacity of Hornsea Project Three exceeds 100 megawatts (MW), the Project is classified as a Nationally Significant Infrastructure Project (NSIP), and must apply for a Development Consent Order (DCO) under the Planning Act 2008 (the Act).

- Hornsea Project Three is currently in the pre-application phase for our DCO, with a consent application expected to be submitted in 2018.
- A Project is required to carry out consultation on their proposed applications before submission, and must take any responses received into account, adjusting the project as appropriate. This consultation includes;
 - Consultation with prescribed bodies, host and neighbouring authorities and any landowners affected by the project (under Section 42);
 - Consultation with the local community in the vicinity of the proposed Project (under Section 47); and
 - General public consultation on the Project (under Section 48).
- If the application is accepted, The Planning Inspectorate (PINS) will then coordinate the examination of our application with an independent Examining Authority panel, who will in turn make a recommendation to the Secretary of State (SoS) for Business, Energy and Industrial Strategy (BEIS).
- Decisions on DCO applications will be made in accordance with the National Policy Statement (NPS) for energy (amongst others), which sets out the need for new energy infrastructure. The SoS will then review and comment on this before making a decision on whether to grant a DCO.



Figure 2: Six stages of the development consent regime.



If successful, construction of Hornsea Project Three is anticipated to take place between 2022 and 2025*.



Consultation Timeline

Hornsea

Offshore Wind Farm





Project Description

Electricity generated by Hornsea Project Three will be transmitted via High Voltage (HV) cables buried underground, using either Direct Current (DC) or Alternating Current (AC), or a combination of the two.

The components comprising the offshore wind farm are likely to include;

- Wind turbines (up to 342)
- Turbine foundations
- Array cables (linking the individual wind turbines to an offshore substation)
- Scour protection
- Offshore accommodation platform(s) (up to 3); and
- A HVAC or HVDC transmission system including either;

HVDC (High Voltage Direct Current)

- Offshore transformer substation(s) (up to 12);
- Offshore interconnector cables(s);
- Offshore converter substation(s) (up to 4);
- Offshore export cables(s) (up to 6);
- Buried onshore export cables(s) (up to 6);
- Onshore substation; and
- Buried grid connection export cable(s).

HVAC (High Voltage Alternating Current)

- Offshore transformer substation(s) (up to 12);
- Offshore interconnector cables(s);
- Offshore export cable(s) (up to 6);
- Offshore HVAC booster station(s) (up to 4 sub surface or 6 sub sea);
- Buried onshore export cable(s) (up to 6);
- Onshore HVAC booster station;
- Onshore substation; and
- Buried grid connection export cable(s).



The DCO will include all associated offshore and onshore infrastructure, including electricity grid connection works.



Generic Offshore Wind Farm Set-Up







Environmental Impact Assessment

In accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulation 10 the Project will undertake an Environmental Impact Assessment (EIA) of the proposed offshore wind farm (for both offshore and onshore elements).

An EIA is an assessment of the likely positive or negative impacts that a development may have on the environment. It considers environmental, social and economic aspects, and includes the following steps;

- 1) Gathering environmental information;
- 2) Providing information about the development;
- 3) Assessing significant environmental effect of the Project; and
- 4) Proposing ways of reducing, avoiding and mitigating any potential adverse effects.

The EIA process includes the following documents:

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1	(COM)
2	in Provi Princi Sector Sector

Published: Scoping Report

Information on the existing offshore and onshore environments in the location of the proposed development and the key issues for the EIA.



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Preliminary Environmental Information Report (PEIR)

This document will incorporate the findings of initial surveys and assessments and will enable consultees to develop an informed view of the potential environmental effects.

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Final Environmental Statement (ES)

The final ES will build on the PEIR and consultation responses to document the impact assessment and proposed mitigation measures.



Offshore Infrastructure

Electricity generated by the offshore wind turbines will be brought onshore by up to six subsea export cables via an offshore High Voltage Alternating Current (HVAC) booster station (if required) before reaching landfall on the north Norfolk coast.

- We have refined the original offshore export cable search area to an indicative preferred 1.5 km export cable corridor.
- This was informed by a constraint mapping exercise and consultation.
- The corridor funnels out at the landfall and at the offshore array area to allow flexibility as plans are further developed.
- This area will be further refined once we have a better understanding of what is physically and technically feasible.







Onshore Infrastructure

The onshore export cable search area runs for approximately 55 km from the landfall zone, in the vicinity of Weybourne to the existing 400 kV Norwich Main National Grid Substation, just south of Norwich.

- We have refined our original search area (approximately 5 km in width) to an indicative preferred 200 m onshore cable corridor, with 100 m technical buffer either side.
- This has been informed by early desk based studies and informal consultation, and will continue to be informed by ongoing environmental and technical feasibility studies, as well as ongoing consultation with landowners, statutory bodies and members of the local community.
- In the coming months, we will look to refine this down to a 80 m cable route (20 m of which will be used for temporary working areas).
- All onshore cables will be <u>buried underground</u>. Once the cable has been installed the land will be restored to its original state. It would not be possible to place any type of construction (i.e. buildings) or deep rooted trees above the cables in case we needed to perform maintenance in the future.











Onshore HVAC booster station

If an HVAC electrical transmission system is selected, Hornsea Project Three would require a booster station to mitigate against power losses between the offshore wind farm itself and the national grid connection point.

- Depending on the outcome of the assessment process and technical feasibility, the HVAC booster station could be situated offshore and/or onshore.
- Due to technical reasons, an onshore HVAC booster station would need to be located as close to the cable landfall at the coast as possible, recognising environmental sensitivities.
- Hornsea Project Three has sought to identify sites for the potential onshore HVAC booster station within the original search area, approximately 10 km from the coastline to make it effective.
- The equipment for the onshore HVAC booster station could be housed within a single or multiple buildings, in an open yard or a combination of the above and would require an area of up to 25,000 m² and could be up to 12.5 m in height.
- We have identified three potential sites for locating the substation within this area, and will consult on these options before a preferred option/s is presented in the Preliminary Environmental Information Report (PEIR).

Constraints mapping exercise



The lighter the segment the less constrained the area is and the more suitable it is considered to be.*

Selecting the best location

The refinement process will also be informed by environmental surveys and technical feasibility studies. We will use this information, along with feedback from these events and further consultation with landowners and statutory bodies to find the best location.

*This does not include all the constraints considered, for example topography.



Onshore Substation

Hornsea Project Three will require a new onshore substation near to the existing National Grid Substation (Norwich Main, near Dunston/Mangreen) to ensure that the electricity supplied to the grid meets the required standards.

- We are currently investigating suitable sites for locating the onshore substation following initial desk based surveys and feedback from informal consultation.
- The substation would require an area of up to 100,000 m² and could be up to 25 m in height. An additional area of up to 28,000 m² will be required for visual mitigation.
- To help us to identify suitable sites for locating the new substation, we have mapped out all known constraints (e.g. residential properties, flood risk areas etc.) within the original search area (3 km radius from Norwich Main).
- The lighter the segment the less constrained the area is and the more suitable it is considered to be. We will use this information, along with the feedback we gather at these events and further consultation with landowners and statutory bodies, to find the best location for siting the onshore substation.









Project Update

SoCC	 Our Statement of Community Consultation (SoCC) was published on our website on 30th September 2016. It was advertised in local newspapers over wk. commencing Monday 3rd October. Hardcopies are available in local Council offices, Parish councils and Community Access Points across the Consultation Zone.
Scoping Area	Defined the Scoping Area, which in turn has assisted in defining the Consultation Area both offshore and onshore.
Scoping Exercise	 Scoping Report issued to the Planning Inspectorate in late October 2016 to review the existing environment (human, biological and physical) in relation to the proposed Project. Scoping Opinion received 6th December 2016 and ongoing engagement with statutory and non-statutory bodies.
Onshore	Carrying out Phase 2 ecological surveys to understand which species are present.
Offshore	Completed offshore geophysical survey of the array area. This will then inform additional assessments for the consent process and also provide initial findings on the geological make up and bathymetry of the site.
Consultation	 Ongoing consultation with statutory section 42 stakeholders and section 47 stakeholders (local communities). Completed second round of community consultation events (02/03/2017 – 10/03/2017). Preparing Consultation Summary Report to provide a summary of the feedback received at this stage.





Feedback from the local community is helping to shape our proposal

In March 2017, we held seven community consultation events in locations across Norfolk on or near to the onshore cable corridor, HVAC booster station options and onshore substation search area.

- 429 attendees
- 128 feedback forms completed*
- Over 90% attendees signed up to distribution list





If you attended one of our community consultation events, how informative did you find it?



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*This includes feedback forms completed by the 31st March 2017 deadline. We also received over 90 individual comments via our communications channels and continue to receive comments.

Supporting the local communities in which we operate

Community Benefit Funds (CBF)

- Voluntary CBFs make a valuable contribution to the local areas by supporting projects such as community building improvements and recreation facilities, conservation and wildlife projects.
- We have committed to CBFs for our Burbo Bank Extension Project, Walney Extension Project and an East Coast fund for Race Bank and Hornsea Project One.
- All existing funds are managed and reviewed annually by the <u>independent</u>, not for profit funding organisation, *Grantscape* to ensure they are being used effectively.
- Hornsea Project Three will review the interactions of the Project as the proposal is refined and consider an appropriate way to feed benefits back into the local community.

Case Study: Liverpool Bay

The Wildlife Trust for Lancashire, Manchester and North Merseyside is a local wildlife charity, working to protect wildlife for the future.

The trust has been awarded a grant of £20,000 in the first allocation round of the Burbo Bank Extension Community Benefit Fund. This will support one full-time Project Officer, who will deliver a programme of inspirational and engaging marine activities to help raise awareness about the importance of marine life in Liverpool Bay.

West of Morecambe Fisheries Ltd.

- DONG Energy has worked with other offshore wind developers to launch the West of Morecambe Fisheries Fund* to support local fishermen based in the vicinity of our offshore wind farms.
- The fund aims to contribute funds to much needed fisheries related initiatives with the intention of improving fishing facilities and equipment in the areas where support is required.
- For example, the Holderness Coast Fishermen were awarded funds to support the running and upkeep of their Research Vessel MV Huntress (2014)

" The Holderness Fishing Industry Group is grateful for the support received from West of Morecambe Fisheries Ltd for our ongoing programme of fisheries research. HFIG represents fishermen, merchants and processors on East Yorkshire's Holderness Coast. The data we collect on the status of the region's valuable crab and lobster stocks is vital in ensuring the future success and sustainability of the biggest crustacean fishery in the UK and protecting the hundreds of livelihoods that depend on it."



Mike Cohen (Chief Executive) Holderness Fishing Industry Group

Hornsea 3 Offshore Wind Farm

*The funding strategy covers a greater area than Morecambe, relating to Project-specific interactions.



Project Contact Details



Website: www.dongenergy.co.uk/hornseaproject3

Read the latest information on Hornsea Project Three, including our plans for public consultation on our dedicated website.

Freephone Information Line: 0800 0288 466

This Freephone information line is open for calls between 9am and 5pm, Monday to Friday, with an answer phone facility to take calls outside these hours. The information line allows members of the local community to ask questions about Hornsea Project Three and the consultation process.

Enquiries Email: contact@hornsea-project-three.co.uk The enquiries email allows members of the local community

The enquiries email allows members of the local community to put general questions or comments in writing about Hornsea Project Three.



Community Access Points (CAP sites)

CAP sites are places where the public can obtain information about Hornsea Project Three. They are local sites easily accessible to people in the area, such as shops, libraries and community buildings. You can find your nearest CAP site by using our online mapping tool on our website.



Newsletters

Quarterly newsletters will contain information about Hornsea Project Three and the progression of the consultation process. Newsletters will be sent to local authorities, council offices and CAP sites, as well as being available online through the website.

Events

We will keep local communities up to date at events such as exhibitions and meetings during the consultation period. Event details will be published in our newsletters, on our website and shared with local groups such as Parish Councils.

Twitter: @DONGEnergyUK #HornseaProject3

We will tweet about Project developments and activities during the consultation period so that you can keep up to date using social media.



Send us a letter:

Hornsea Project Three Offshore Wind Farm, c/o Emily Woolfenden, DONG Energy Power (UK) Ltd, 5 Howick Place, Victoria, London, SW1P 1WG





Any questions?







Maps of proposed indicative 200m onshore cable corridor & onshore HVAC booster station options across north Norfolk









































Norwich Main National Grid Substation (Dunston/Mangreen)







Photograph taken from blue cross looking north







Photograph taken at their site entrance off Mangreen Lane (red cross)







Photograph taken from blue circle looking towards the substation







Photograph taken in the field to the south of the substation standing next to railway





