

VATTENFALL IN NORFOLK KEEPING YOU INFORMED

Active, Positive & Open in Norfolk

At Vattenfall our drive is to help all of our customers power their lives and services in ever climate smarter ways and free from fossil fuels within one generation. In the UK our focus is wholly on renewable energy and systems that make the UK's power supply more resilient. We believe that by being active, positive and open we can inspire everyone to contribute to creating a better energy future and better local solutions.

Here are some ways we're working with people in Norfolk, now and in the coming weeks.



UTC – new course for tomorrow's engineers

Vattenfall staff have worked with motivated students studying at University Technical College Norwich (UTC) to support their understanding of wind farm development and apply their engineering knowledge to current challenges. Here Rob Driver (Electrical Engineer) talks with a small group of students interested in the offshore cabling.



Milly enjoys work experience with ecological surveyors

Milly, came to the first Spring 2017 drop-in exhibition, got talking to the team, and asked whether we could help her gain an insight into the work of a professional ecologist. We said yes, and arranged for her to join one of the survey teams. Afterwards Milly told us: *"It's been new to me and I have used practical skills and seen the full process of mapping ... in college we would never see this whole process. I love it and if anything it has given me even more enthusiasm."*



Working with local businesses: awarding a substantial contract to Norfolk Wildlife Services

We're delighted to have secured a local consultancy to undertake ecological surveying across the area we are considering for the siting of onshore works. Chris Smith of Norfolk Wildlife Services seems to agree:

"It is extremely positive that a local consultancy has been chosen and that we have been involved so early on in this process."



Dereham Festival – 6th – 9th July

This event is a local highlight. Vattenfall is keen to support, encourage and enable the charitable educational work of the Dereham Blues Festival to inspire the next generation of media professionals and musicians. We will be there in person on the promotional day (1st July) so come along and say hello.

www.derehamb bluesfestival.org.uk



Reepham Festival – hearing your voices and your views – 12-13th August

Another local event that's blossoming & increasing the footfall into town. We'll have a stall, and look forward to meeting you. We are sponsoring two young bands to showcase their talent.

www.reephamfestival.co.uk

Norfolk Vanguard timeline

June-August 2017 – Develop and publish a Statement of Community Consultation (detailing how local communities will be involved in the formal or statutory consultation for the project)

January 2018 – Feedback to you and others and available on-line

Mid-End 2019 – Secretary of State decision on the application expected



Summer 2017 – We'll be attending local events to meet some of you again, and new faces too



November 2017 – Consult on the Preliminary Environmental Information Report which will outline the initial results of our environmental assessments, as well as a more detailed project design. We'll hold a third round of drop-in exhibitions then too

Spring-Summer 2018 – Vattenfall makes an application for a Development Consent Order for Norfolk Vanguard

Survey Update

We are undertaking numerous surveys as part of our Environmental Impact Assessments e.g. background noise surveys, traffic counts, viewpoint photos. These provide vital information, helping us to refine our proposals further.

Ecological surveys will be continuing throughout the summer, along the cable route and in the search areas.

Site investigations will begin with some geotechnical drilling to help understand the nature of the strata we might encounter as we consider the best locations and methodologies to undertake Horizontal Directional Drilling, for example under the Wensum and the Bure, other linear features and the coast.

Next steps

All those who have participated to date have informed our thinking in varied and important ways, helping us to refine the project proposals. It's not too late to shape the project. In the Autumn, we will begin what is known as Statutory Consultation. This is a really important opportunity for local people, stakeholders and experts alike to comment on the proposals we'll share then, as well as comment on the findings of our preliminary environmental investigations.

Our next newsletter – look out for it in October 2017 – will highlight our Autumn drop-in consultation events. Feed-back you provide then, will inform the final Norfolk Vanguard proposals we submit to the Planning Inspectorate in the Summer of 2019.

Are you a Landowner?

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What's in this newsletter:

- Norfolk Vanguard and Norfolk Boreas – news update
- How Offshore Windfarms work for the UK
- Norfolk Vanguard timeline
- Out and about in Norfolk
- Next Steps

About Vattenfall

- 100% owned by the Swedish state
- Operations in Sweden, Denmark, Finland, Germany, the Netherlands, Poland, and the United Kingdom
- Ten UK offices with over 200 staff
- Since 2008, we have invested £3bn in the UK
- Vattenfall aims to be carbon neutral by 2050



Hearing your views – Thank-you

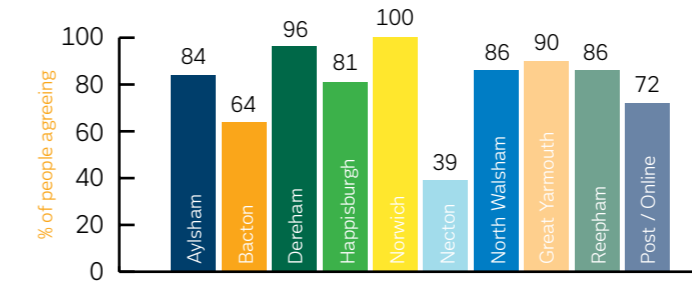
At drop-in exhibitions held in March / April 2017, we heard your response to progress and refinements to the Norfolk Vanguard project, and began conversations about the Norfolk Boreas project. We visited nine venues, and were joined by more than 830 people. Response levels were high – we had over 260 responses, many comprising very considered and detailed feedback. We're really pleased to receive all your input.

The material presented explained how the Norfolk Vanguard and Norfolk Boreas projects work together, as well as pointing out differences, not least in terms of their timelines. Developing these projects in close succession leads to strategic advantages.

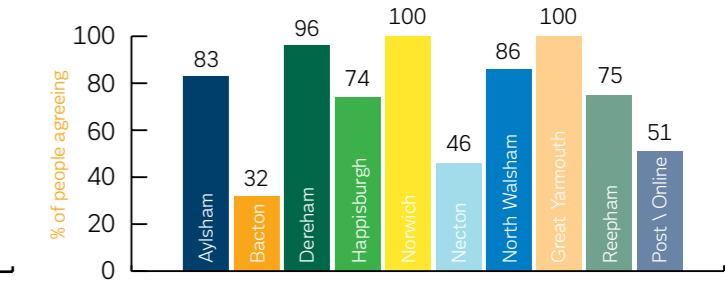
Responses following the information-sharing events assure us it is widely understood Norfolk Vanguard and Norfolk Boreas are subject to consenting planning applications (known as Development Consent Orders), and that it makes sense to develop aspects of the projects together and co-locate infrastructure for both projects where possible in order to reduce potential impacts, maximise opportunities and help reduce energy costs.

While most understand how their comments will "help inform the development of both projects", we note some significant differences in responses from location to location. The graphs below show the percentages of people agreeing with statements, according to location.

"It makes sense to co-locate infrastructure for both projects where possible in order to reduce potential impacts, maximise opportunities and help reduce energy costs"



"I understand how my comments will help to inform the development of both projects"



You can download a summary report and a full report of the drop-in events at norfolkvanguard.vattenfall.co.uk

All the material presented at the October 2016 and Spring 2017 drop-in exhibitions is also available.

The reports will give you more understanding of how your feedback continues to help shape the projects.

Refining project proposals with your help

Our electrical and geotechnical engineers, ecologists, landscape, traffic and noise specialists and other team members have been studying all the data gathered so far, including your feedback, and have refined our project proposals. While there are only minor changes to the underground cable corridor at this stage, we have been able to refine the focus of our landfall, cable relay stations and project substation search areas.

This map is an overview - you can review the entire route in more detail by using our interactive map on the website (norfolkvanguard.vattenfall.co.uk), which allows you to zoom in for more detail.

Landfall Search Zones – we are focussing our landfall search to an area south of Happisburgh village. This:

- Avoids offshore cables traversing the Marine Conservation Zone
- Accommodates the co-location of Norfolk Vanguard & Norfolk Boreas transmission cables
- Means maintaining two cable corridor options near landfall for now in order to accommodate cable relay station options (if required)

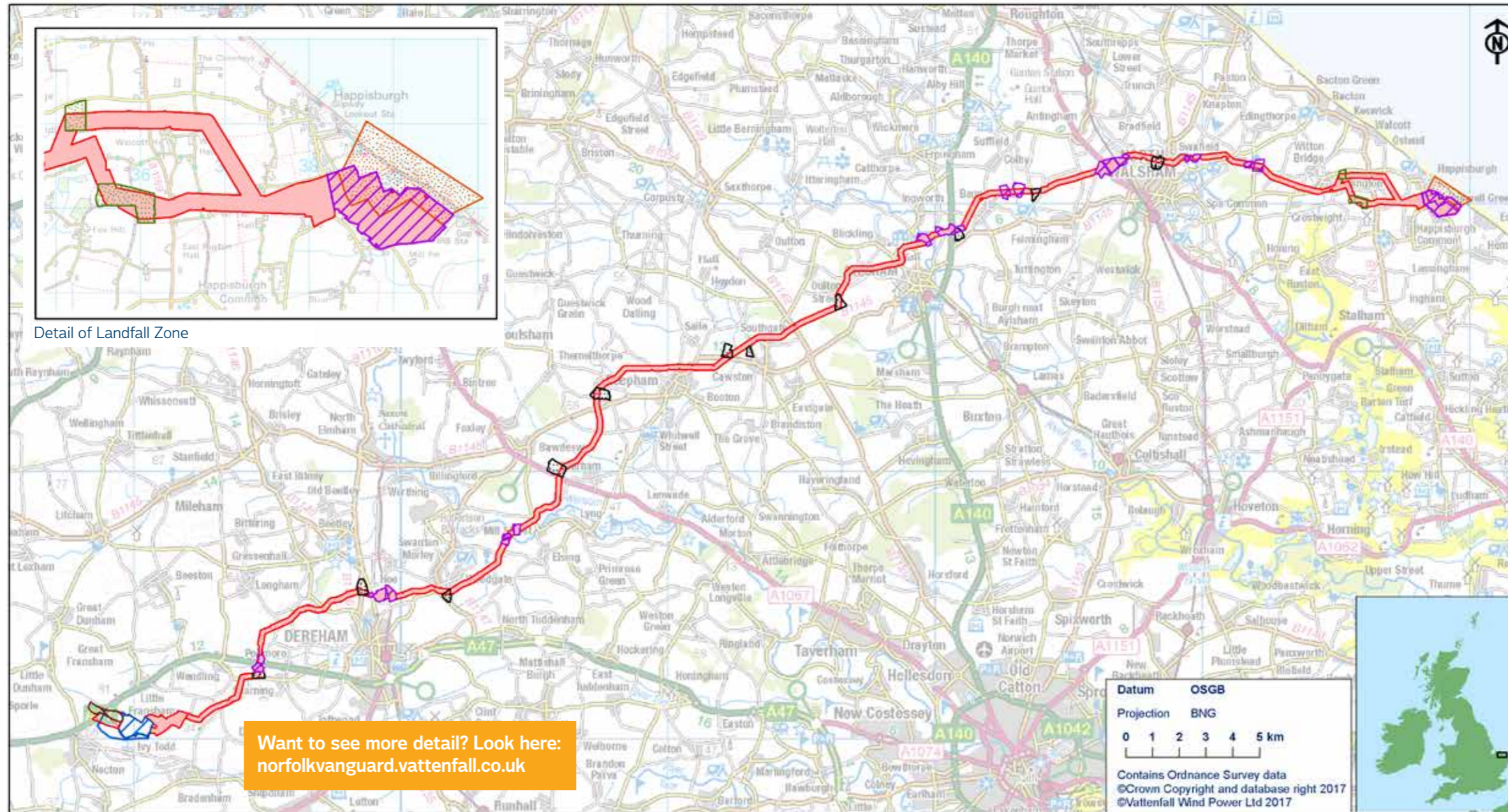
Cable Relay Station (CRS) Search Zones – we are focussing our searches on what we formerly called zones 5 and 6. They offer:

- Relative seclusion – they avoid villages and clusters of housing
- Space to co-locate project CRS should they be required
- Good access
- Natural screening and topographic characteristics that we can work with to help minimise visual and noise impacts

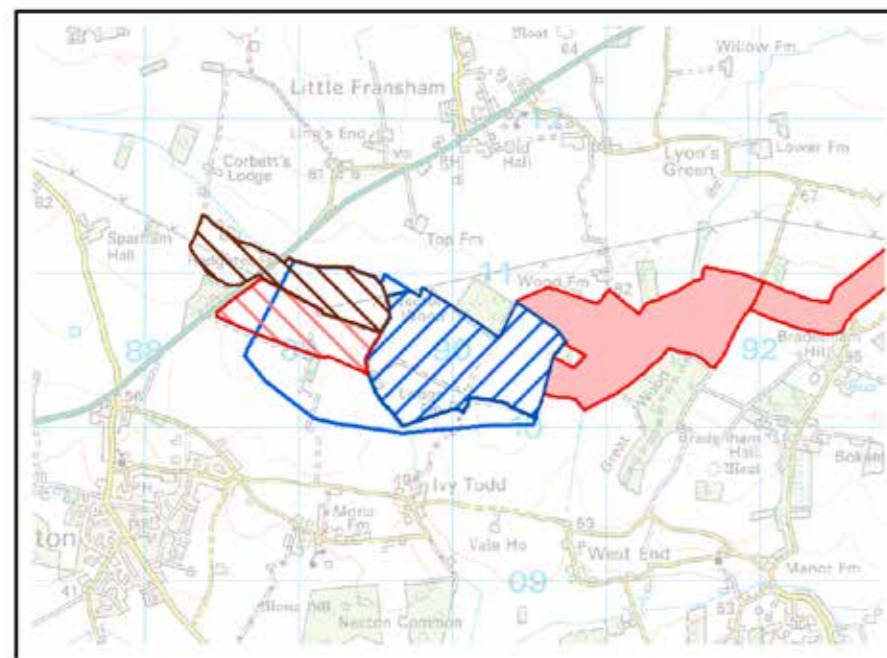
More work is required in order to determine the best location of the CRS should they be required (in the case of an AC power transmission system). Applying for consent for both AC and DC technologies helps us future-proof the projects, meaning we can deploy best in class technology when we are ready to begin construction in the early 2020's.

Onshore Project Substation Search Area – this has been reduced. The search for the best location for project substations is focused within an area to the east of the existing Dudgeon substation. This area offers:

- Relative seclusion – maximising the distance from clusters of housing, without being too distant from the existing National Grid substation
- Natural screening and topographic characteristics that we can work with to help minimise visual and noise impacts



Refined cable route corridor and search areas



Detail of grid connection zone

	Onshore underground cable corridor	Areas where the underground export cables could be located
	Mobilisation zones	Areas where compounds needed during construction could be located
	Trenchless / Horizontal Directional Drilling zones (HDD)	Areas where we could drill under features to minimise potential impacts
	Landfall zone	Area where landfall ducts could be located, to house the ends of the subsea cables
	Landfall HDD zone	Area where the drilling operations for the landfall ducts could be carried out
	Cable relay station zones	Areas where a cable relay station for each project could be located if required (under an HVAC electrical solution)
	Refined onshore project substation zone	Area where an onshore project substation for each project could be located
	National Grid substation extension zone	Areas where extensions to the existing 400kV National Grid substation at Necton for each project could be located
	Overhead line modification zone	Area where some modifications to the existing overhead lines could be located
	Underground cable corridor at the substation	Area where the 400kV cables connecting the onshore project substation to the existing National Grid substation could be located

Responding to your interests

In each newsletter, we reflect on topics that people we interact with have asked us about. Many would like more information on the offshore wind industry's contribution to the UK in terms of energy needs and economic development.

Did you know?

- The cost of offshore wind has fallen by 32% since 2012 and continues to fall; it will be one of the lowest cost sources of new power in the 2020s.
- Offshore wind will generate 10% of the UK's electricity by 2021.¹
- The UK leads the world in offshore wind and exports expertise around the world. Projects have a strong track record of being built on time and on budget. We lead the world in exciting innovations in technology – including bigger, more efficient turbines, foundation design, weather and wave forecasting, and digital development.
- Since 2010, over £9.5bn has been invested in offshore wind in the UK.
- By 2021, offshore wind will be the sixth biggest infrastructure programme in the UK.
- In 2015 the industry employed 3000 people in the UK.²

How can Norfolk benefit?

- The East of England is already at the heart of the UK offshore wind industry. Norfolk can reap economic and social benefits of industry growth into the 2020s and beyond as projects currently in construction are completed.³

Once in operation, Norfolk Vanguard and Norfolk Boreas together will:

- Deliver home-grown energy equivalent to roughly half the total energy needs (commercial, industrial and domestic) of the East of England region.⁴
- Save five million tonnes of CO₂ each year.⁵
- Employ up to 150 highly skilled technical staff – experts in electrical & mechanical engineering, working at sea and at height, as well as marine, commercial and communications specialists. These are all long-term jobs which can be the basis for successful careers in a fast growing, global industry. We've met some young hopefuls, already eager to join this exciting phase of Norfolk's development – see overleaf.

Kathy Wood, environment manager for Norfolk Vanguard and Norfolk Boreas

Many people both showed huge interest and knowledge regarding Norfolk's wildlife on and offshore, as well as concern for the protection of the local environment. We are proud of our environmental record. In the last newsletter, we highlighted some of our environmental research. This time, we thought you might like to meet one of our environmental champions:



"Hello. I'm Kathy Wood, environment manager for Norfolk Vanguard and Norfolk Boreas. It's my job to ensure that all aspects of project development consider ecology and the wider environment both onshore and offshore. Whether at public drop-in exhibitions or expert meetings, it is always interesting to explore with others – so many are of you are well informed – the special characteristics of Norfolk and the Southern North Sea. This information allows us to shape the project sensitively according to what we're learning. From bat foraging

sites onshore, to migrating birds offshore, from river quality to archaeology, and reducing impacts on local people, the range of topics our team needs to consider is huge.

Our aim is to deliver a well-designed renewable energy project, striking the right balance between local factors and the wider environmental benefits of long-term carbon reduction, whilst also delivering lower-cost energy to the UK consumer. Having local input in this process is invaluable. Thank-you for all your feedback so far, please keep feeding into the process."

¹ <http://www.renewableuk.com/news/news.asp?id=327446>

² <https://www.ons.gov.uk/releases/lowcarbonandrenewableenergyeconomysurvey2015>

³ http://cymcdn.com/sites/www.renewableuk.com/resource/resmgr/publications/East_Regional_Wind_Factsheet.pdf

⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/552059/Chapter_5_web.pdf

⁵ <http://www.renewableuk.com/page/UKWEDexplained>