East Anglia TWO
Offshore Windfarm and
East Anglia ONE North
Offshore Windfarm

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Welcome and introduction to SPR

Welcome to our public information day about our proposed East Anglia TWO and East Anglia ONE North projects. Members of our project team are on hand today to answer any queries you may have.

ScottishPower Renewables (SPR) is part of Iberdrola, one of the world's largest utility companies and the leading wind energy producer.

SPR is responsible for progressing offshore windfarms throughout the world and onshore wind and marine energy projects in the UK. It is currently taking forward the development and progressing the construction of the 102-turbine East Anglia ONE offshore windfarm approximately 43km off the coast of Suffolk. This £2.5 billion project is planned to deliver energy to meet the annual demand of around 600,000 homes and should be fully operational during 2020. This project will be followed by the 1,200MW East Anglia THREE windfarm which recently received development consent.

West of Duddon Sands, ScottishPower Renewables

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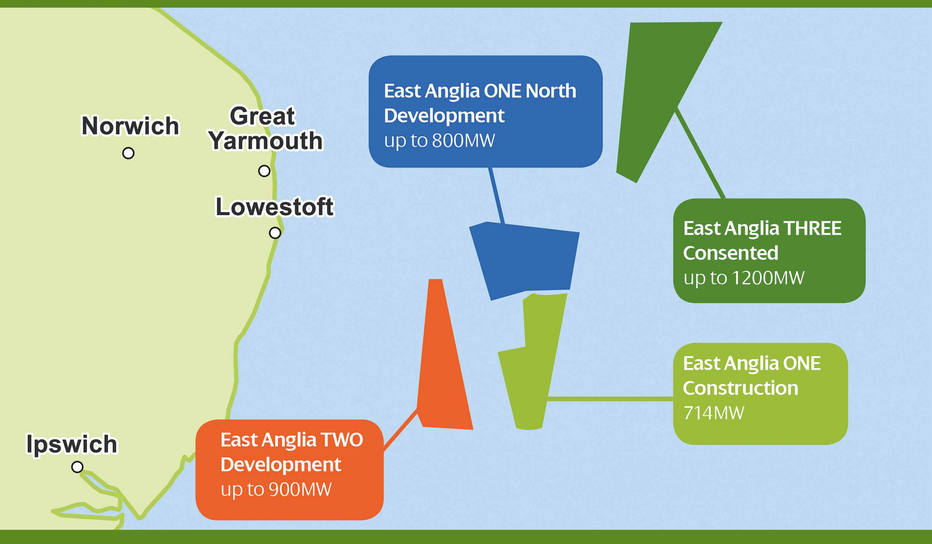
Our Projects

Building on these first two East Anglia projects, SPR is now seeking to progress development of the proposed East Anglia TWO and East Anglia ONE North projects.

	East Anglia TWO	East Anglia ONE North
Distance to shore (in a straight line from the edge of the windfarm)	31km from Lowestoft 32km from Southwold 40km from Orford Castle 35km from Sizewell Beach	36km from Lowestoft 42km from Southwold 60km from Orford Castle 50km from Sizewell Beach
Project area	255km^2	208km^2
Anticipated capacity	900MW	800MW
Proposed wind turbine height	Up to 300m	Up to 300m
Potential number of homes powered	740,000	650,000
Number of turbines	Up to 75 - exact number, layout and dimensions will be determined post consent and prior to construction	Up to 67 - exact number, layout and dimensions will be determined post consent and prior to construction



*Calculated taking the number of megawatts (900/800) multiplied by the number of hours in one year (8,766), multiplied by the average load factor (efficiency of electrical energy usage) for offshore wind (36.7 %, published by the Digest of United Kingdom Energy Statistics), divided by the average annual household energy consumption (3,900 kWh), giving an equivalent of powering 659,922 / 742,413 homes.

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3 Why is offshore wind so important?

The need to reduce greenhouse gas emissions

- Global temperature rise as a result of greenhouse gas emissions in the atmosphere is associated with potential impacts on weather, ecosystems and human health and welfare.
- The UK has made commitments internationally to limit global temperature increases and has committed to a 57% reduction in carbon emissions by 2032 (compared to emission levels in 1990).
- The Committee on Climate Change has recommended that the UK government should support 1-2GW of new offshore wind per yearin the 2020's.
- Through the Climate Change Act 2008, the UK has made the commitment to an 80% reduction (compared to 1990 levels) in greenhouse gas emissions y 2050.

The need for energy security

- With existing fossil fuels and old nuclear powered electricity generation coming to the end of their operational lives, there is a need to use alternative methods to generate electricity as old infrastructure is decommissioned.
- Figures show that the net import of electricity to the UK in the second quarter of 2017 was 6.9% of electricity supply. In this period generation fell by 3.3% compared with 2016, highlighting the need for new infrastructure to deliver a secure national energy supply as part of a long-term sustainable energy policy.

The need to maximise economic opportunities from energy infrastructure investment for the UK

- A key commitment within the UK is to assist in making the UK a green industry centre by supporting the development and use of clean energy technologies.
- The Industrial Strategy sets out The Government's vision for the offshore wind industry whereby industry and government work together to build a competitive and innovative UK supply chain that delivers and sustains jobs, exports and economic benefits for the UK, supporting offshore wind as a core and cost-effective part of the UK's long-term electricity mix.
- The Centre for Economics and Business Research estimates that by 2030, offshore wind could increase the Gross Domestic Product (GDP) value by 0.6% and support 173,000 jobs.

The need to produce affordable energy

- As offshore wind technology has matured and developers have innovated there has been a significant reduction in the cost of energy produced by offshore wind in recent years.
- The price of new offshore wind has fallen significantly. Further cost reductions will continue as technologies develop in response to market pressures and consumer demand.
- The cost of new offshore wind projects starting to generate electricity from 2022-23 will be 50% lower than in 2015.

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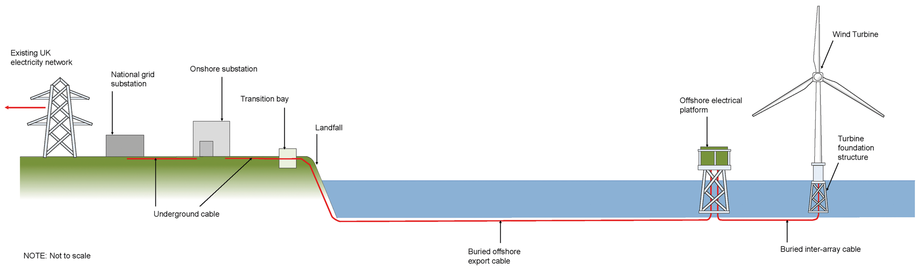
How does an Offshore Windfarm work?

- Offshore wind turbines convert energy from the wind into electrical energy.
- Electricity is then transmitted from the wind turbines to offshore electrical platforms.
- Offshore electrical platforms are located within the windfarm site, containing electrical equipment to collect the power from the wind turbines and convert it into a more suitable form for export to shore.
- The electricity is then brought to shore from the offshore electrical platform via buried offshore export cables which are connected to underground onshore cables at the landfall via a transition bay.
- The underground onshore cables take the electricity to an onshore substation which transforms high voltage current from the windfarm to lower voltages suitable for distribution onto the national transmission network.
- Electricity is then transmitted via underground cables to the National Grid substation and then on into the national transmission network.



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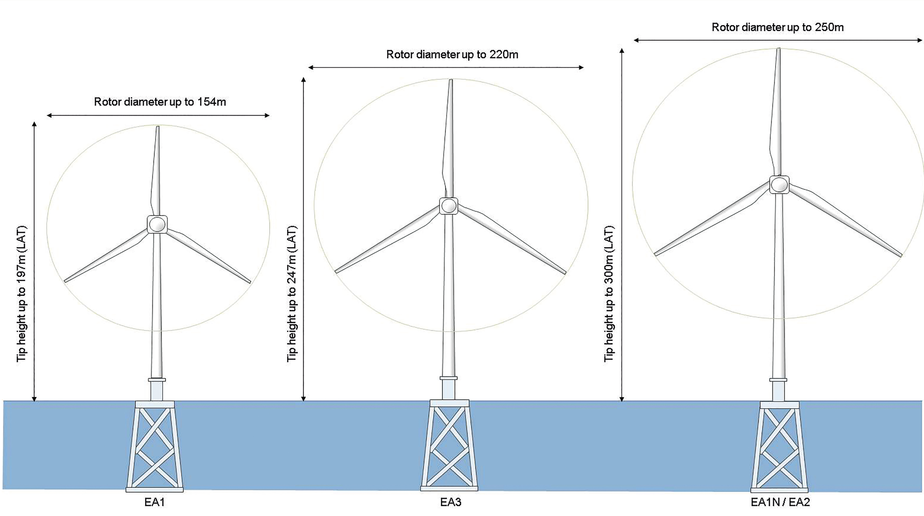
Wind Turbine Technology

The proposed East Anglia TWO and East Anglia ONE North projects are likely to consist of up to 75 and up to 67 wind turbines respectively.

The range of wind turbines currently being considered is 12MW – 19MW. Note that, the actual MW capacity of the wind turbine does not drive the environmental assessment process; it is the physical parameters, for example the tip height or hub height which are important for the assessments.

It is estimated the maximum wind turbine tip height used would be 300m with a rotor diameter of up to 250m.

The images below illustrate the dimensions and the design of a wind turbine:



The technologies used in offshore wind turbines are constantly evolving and the industry is moving towards larger more powerful wind turbines. For these projects up to 19MW wind turbines are being considered.

The benefits of installing larger machines are:

1. Fewer foundations
2. Reduced installation programme
3. Lower costs

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How an Offshore Windfarm is Consented

Consultation is on-going throughout the consent application.

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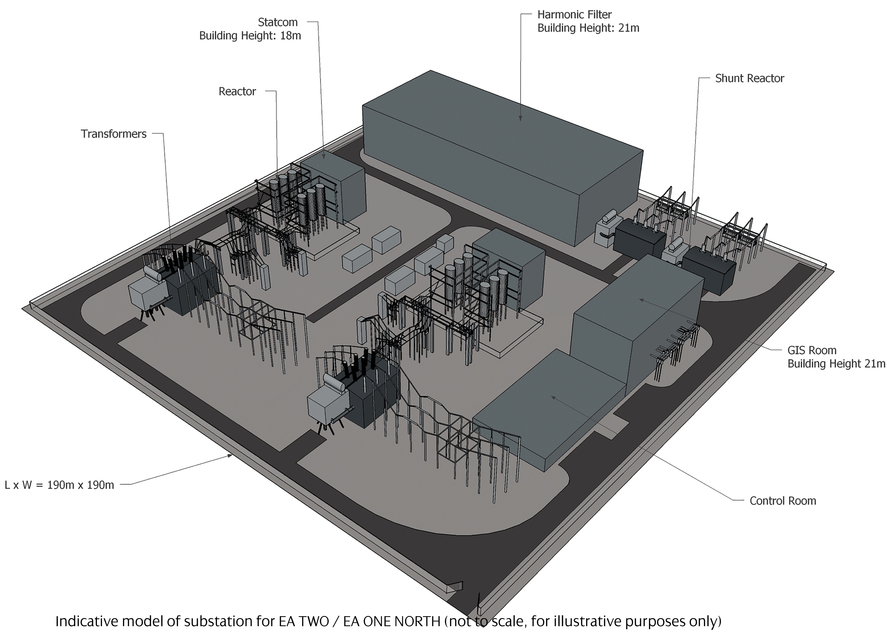
Agreeing our grid connection

National Grid owns and operates the transmission network in England and Wales. In order to connect to the electricity transmission network SPR requires a grid connection agreement with National Grid.

SPR received a grid connection offer in 2010 for up to 3.6GW at Bramford which would have allowed both the proposed East Anglia TWO and East Anglia ONE North projects to connect at that location. To comply with the statutory duties under Section 9 of the Electricity Act 1989 (HM Government 1989), the preferred connection design should be the most economic and efficient when considering both offshore and onshore works. National Grid therefore undertook a subsequent review in 2017, which concluded that connecting both the proposed East Anglia TWO and East Anglia ONE North projects in the vicinity of Sizewell and Leiston is the most economical solution, the key factor being the much shorter onshore cable route required.

Both windfarms' physical connection to the electricity transmission network will be into the existing pylons along the overhead lines in the vicinity of Sizewell and Leiston, with National Grid's required infrastructure located as close as possible to existing pylons.

In addition to the substations for East Anglia TWO and East Anglia ONE North, a new National Grid substation will be required and additional infrastructure to connect to the UK electricity network (sealing end compounds / gantries and potentially upgrades to the existing overhead circuits). SPR will consult on and consent this infrastructure for National Grid to own and operate. At present it is anticipated that the National Grid substation will be an Air Insulated Switchgear (AIS) facility measuring up to 325m x 140m with external equipment up to 13m. The indicative model of the substation required for East Anglia TWO and East Anglia ONE North is shown below.



Indicative model of substation for EA TWO / EA ONE NORTH (not to scale, for illustrative purposes only)

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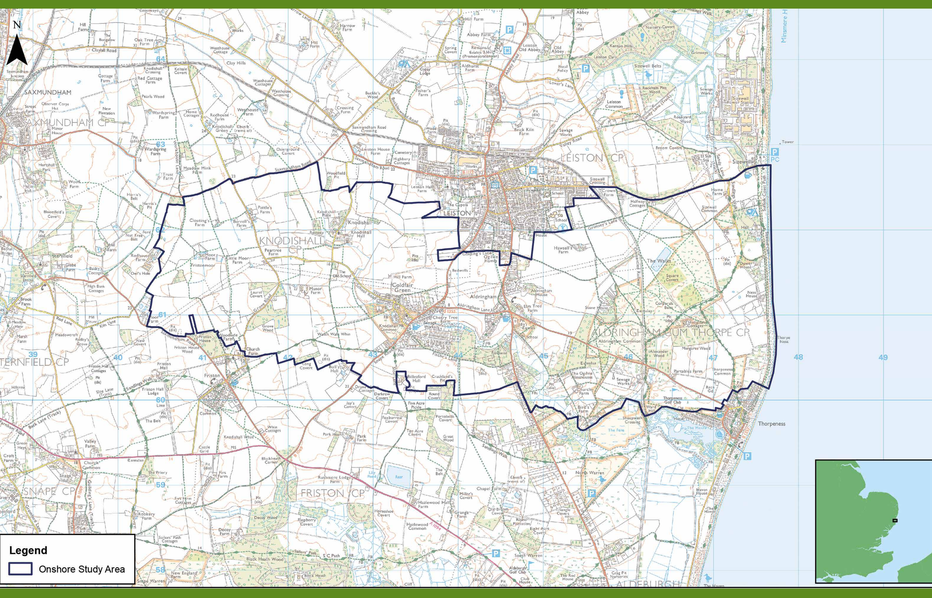
Onshore Study Area for the Connection Point and Substation Footprint

The proposed East Anglia TWO and East Anglia ONE North projects will each require their own onshore substation. The site selection process is currently on-going and we are reviewing the following onshore study area, ensuring we comply with our statutory duties. Within this study area we will identify locations for the landfall, cable routes and onshore substations.



The study area has been identified considering physical and environmental constraints, a grid connection in the vicinity of Sizewell and Leiston, and a landfall between Sizewell and Thorpeness.

Each onshore substation will be located within a single compound with a mixture of warehouse style buildings and external electrical equipment and gantries and will be up to 190m x 190m, with external buildings up to 21m and external equipment up to 18m in height.

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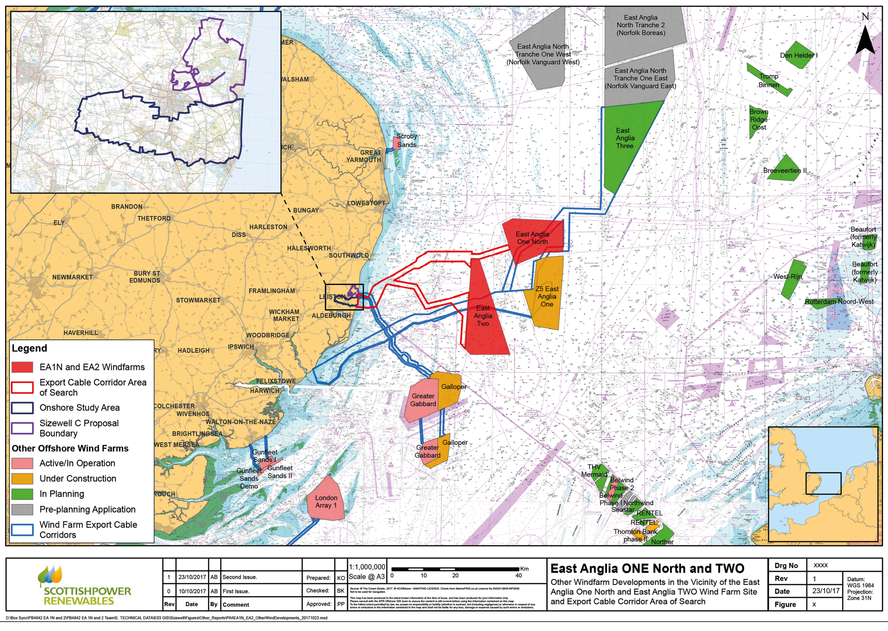
9 Cumulative Impact

We are aware of a number of projects that are either in the development process, have consent or are under construction. An important part of the Environmental Impact Assessment process will be to ensure that not only are the impacts of East Anglia TWO and East Anglia ONE North assessed but that impacts in combination with other projects are also assessed.

Key potential cumulative impacts being considered include:

- Construction traffic
- Construction noise
- Operational noise
- Landscape and visual (of onshore and offshore components)
- Ornithology and ecology

These impacts, along with others, will be reported in the Environmental Statement and there will be future consultation events where these can be explained further.



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10 Timeline

Following these public events we will be moving into the Environmental Impact Assessment scoping phase where we will agree the scope of the assessment with the Planning Inspectorate and other consultees. Scoping Reports will be submitted to the Planning Inspectorate in November 2017 and a formal scoping opinion provided to us before the end of the year.

Before we reach a position where we are able to submit our applications for consent we will be carrying out further public engagement to keep you up-to-date on how our plans are progressing. The next events are expected to be during summer 2018 where we will be presenting the findings from our site selection work to identify suitable locations for the landfall, the required substations and onshore cable routes.

Feedback forms and a suggestion box are available today for you to share your comments.

Our anticipated timeline is detailed below:

East Anglia TWO

2017
Autumn 2017:
Public information days
Winter 2017:
Scoping report* submitted

2018
Autumn 2018:
Consultation on draft
Environmental Statement

2019
2019:
Development Consent
Application

2024
2024
Commence Construction

East Anglia ONE North

2017
Autumn 2017:
Public information days
Winter 2017:
Scoping report* submitted

2019
Autumn 2019:
Consultation on draft
Environmental Statement

2020
2020:
Development Consent
Application

2025
2025
Commence Construction

*Providing a description of project components and the connection route to the electricity transmission network

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www.scottishpowerrenewables.com/pages/east_anglia_one_north.aspx