

A wide-angle photograph of the Teesside Offshore Wind Farm at dusk. Three large wind turbines are visible in the foreground, their silhouettes and lights reflecting on the calm water. In the background, the city of Teesside is illuminated with warm lights, creating a contrast with the cool blue tones of the twilight sky. The sky is filled with soft, wispy clouds, and the overall atmosphere is serene and hopeful.

Building now for a greener tomorrow

Working towards a low carbon future

**Teesside Offshore Wind Farm** Officially opened 16th April 2014



“ For EDF, Teesside is particularly special. It is our first offshore wind farm in the UK. The project’s development, engineering and construction have been entirely led by EDF Group companies. It demonstrates the ability of EDF to draw on our collective expertise to deliver the low carbon infrastructure we need. ”

**Henri Proglio**, Chairman and CEO, EDF Group

# Welcome to Teesside Offshore Wind Farm

The Teesside Offshore Wind Farm is EDF Group’s first UK offshore wind farm. Located off the North East coast at Redcar, the 27 turbine scheme is capable of delivering 62MW of low carbon electricity.

EDF Energy Renewables is one of the UK’s leading renewable energy companies. It is focussed on the development, construction and operation of onshore and offshore wind farms and already operates 462MW of onshore wind farms. The company employs more than 80 people and has a pipeline of onshore and offshore projects totalling over 1500MW in development.

EDF Energy Renewables is a 50/50 joint venture between EDF Energy and EDF Energies Nouvelles set-up in 2008 to develop, build, own and operate renewable assets in the UK.

The wind farm has the capability to produce enough low carbon electricity to meet the average annual needs of all the homes and businesses in Redcar, Marske and Saltburn.

27 x Siemens 2.3MW turbines arranged in three rows of nine with an installed capacity of 62MW.

The wind farm is located 1.5km off the coast at its nearest point.

Subsea cables connect the wind farm to a newly built substation at Warrenby.

The Warrenby substation supplies electricity to another substation at Lackenby where it is connected to the national transmission system - the National Grid.

“ This is an important project for the company and I am proud that we have completed it successfully. I would like to thank all of those involved in making it possible. ”

**Vincent de Rivaz**, CEO, EDF Energy

“ The Teesside Offshore Wind Farm demonstrates our expertise and commitment to contributing to a diverse, low carbon energy generation mix for the UK. Developments like this were intended as pioneering projects. The experience gained here further builds our credentials as a major player in wind energy and will be invaluable in our development of other offshore wind farms. ”

**Christian Egal**, CEO of EDF Energy Renewables

“ We are delighted to have played such a central role as the main logistical hub for the successful development of the Teesside Offshore Wind Farm. ”

*Jerry Hopkinson, Managing Director, Bulks and Port Services*

“ This has been an exciting and very demanding project. An offshore wind farm requires much closer integration of design and construction activities than an onshore wind farm because of the additional challenges of operating at sea, with the vagaries of weather and other operating conditions. ”

*Tim Bland, Project Manager, Teesside Offshore Wind Farm*



As part of the planning process extensive Environmental Impact Assessments were carried out, including surveys of marine ecology and local bird populations.

The Teesside Offshore Wind Farm is able to produce enough low carbon electricity to supply the annual needs of approximately 40,000 homes.

The electricity produced by the wind farm will offset the annual release of in excess of 80,000 tonnes of carbon dioxide.

## Project history

The project received final approval in 2008 and onshore construction started in 2011 with offshore construction starting in February 2012. The project was completed in July 2013.

Extensive pre-consent public consultation was carried out on the project and separate liaison was conducted with special interest groups.

## Port of Hartlepool supply base

A dedicated supply base supporting the construction of the wind farm was established at the Port of Hartlepool. From here, specialist vessels transported all materials and construction staff to the offshore site over an 18 month period. At peak work periods over 350 construction workers were involved on site, which falls under the jurisdiction and control of the Tees and Hartlepool Port Authority. Around 1.2 million man hours were required in total by the project and according to an independent study around 950 jobs were directly or indirectly created by the construction.

The Port of Hartlepool, which is owned and operated by PD Ports, is the base for the specialist team that will have responsibility for the ongoing operation and maintenance of the wind farm.



Each steel monopile is around 45m long and supports a 15m long transition piece, which includes all electrical cable connections.

Buried offshore cables connect all the turbines and bring the power generated to the shore.

The wind turbines are 300m apart and there is 600m between each row.

Turbine spacing will enable leisure craft and small fishing boats to pass safely between them.



## Foundations and cabling

The first phase of construction work, carried out by Van Oord, a Dutch company specialising in maritime works, involved the installation of the turbine foundations. These comprised steel monopiles sunk to a depth of around 25 to 30m under the seabed, at water depths of up to 16m.

Yellow T-shaped transition pieces were then added to the monopiles to form the linking structure between the foundations and the turbine towers. The transition pieces also house the access ladders, platform and cable connection points.

## Onshore works

Two 33kV subsea cable circuits from the wind farm bring electricity onshore. Specialist cable laying equipment ensures the safe burial and protection of the cables, which continue under the beach to connect to the onshore electrical substation at Warrenby. This involved horizontal directional drilling under the dunes to protect their status as a Site of Special Scientific Interest.

The substation comprises a control building and transformers which increase the voltage to 66kV for transfer to the Lackenby substation and connection to the national electricity transmission system.



The diameter of the rotor blades is 92.4m.

The turbines measure 80m from sea level to hub height.

There is a minimum clearance of 33.5m between the tip of the rotor blade and mean sea level.

The turbines start to generate electricity at a wind speed of 3.5m/s.

“We are delighted to bring this project on stream and its completion is an important step in establishing EDF Group’s credentials in the offshore wind energy industry.”

**Antoine Cahuzac**, CEO of EDF Energies Nouvelles

“MPI is a North East based ship management and construction management organisation. As the project management contractor for this demanding project we are very proud to have successfully completed this offshore renewable energy facility for the region.”

**Peter Robinson**, Managing Director, MPI Offshore Ltd

## A towering achievement

Rotor blades and the central nacelle (hub) were assembled at the Port of Hartlepool and shipped out to the offshore construction site with the turbine towers using the specialist MPI Adventure six leg jack-up vessel.

The two sections of the tower were installed onto the transition pieces, before the blades and nacelle were put into place as a single unit. The lifting and precision placement of these extremely large and heavy structures was a highly complex task demanding calm weather and sea conditions.

Once the turbine installations were completed, work began on the electrical connection, testing and commissioning of the turbines by Siemens.

## Supporting local communities

EDF Energy Renewables has already supported a number of recreational events and activities on Coatham beach, against the backdrop of the wind farm.

The company has been a regular supporter of the annual ‘Kitetastic’, British Kite Surfing Association event which attracts top kitesurfers and freestyle kite buggy and kite landboard specialists from all over the country. In addition, EDF Energy Renewables helped to ensure the return of landsailing to Redcar after an absence of 34 years, with support for the inaugural British Landsailing Redcar Regatta.

As part of the ongoing commitment to support local community groups, a special community benefit fund has also been established in a partnership between Teesside Offshore Wind Farm and Tees Valley Community Foundation. The Foundation is already managing the fund to allocate grants to help support and develop a range of new initiatives in the local coastal communities and surrounding areas.





The Teesside project is the North East's first large scale commercial wind farm.

The coming on stream of the Teesside project took the capacity of operational turbines in UK offshore waters to over 3,500MW.

Offshore wind farms can act as artificial reefs and fish aggregation devices for the benefit of local fishing activity.

The wind farm does not have any effect on surfing, leisure or water activities carried out from Redcar beach.

“The successful completion and hand over of the Teesside Offshore Wind Farm is a mark of the close cooperation enjoyed between the EDF Energy Renewables and MSS construction teams.”

**John McCullagh**, Director, Marske Site Services (MSS)

# A continuing presence

With the completion of the construction of the new wind farm, a specialist operation and maintenance team will operate from new premises being established at the Port of Hartlepool.

The dedicated team of 15 permanent employees will include both EDF Energy Renewables staff and the on-site service team of turbine manufacturer Siemens. The new centre will be responsible for the ongoing operation, servicing and maintenance of the wind turbines, as well as the electrical systems and cabling associated with the wind farm and the onshore substation.

“Utilising our excellent ports and over 20 local suppliers in the construction process, the offshore wind farm has been good for the local economy and continues to provide local jobs. This has been a fascinating project for local people to see come into fruition.

Hate it or love it the face of our coastline has changed and I congratulate EDF Energy Renewables on completing this difficult project.”

**Ian Swales MP**



Officially opened on the 16th April 2014 by Rt Hon Michael Fallon MP, Minister of State for Business and Energy and Henri Proglio, Chairman and CEO, EDF Group.



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[www.edf-er.com](http://www.edf-er.com)

[EDFERAssetmanagement@edf-er.com](mailto:EDFERAssetmanagement@edf-er.com)

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