

Sheringham Shoal

by Scira Offshore Energy

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The wind farm and the local environment

As the world's demand for energy continues to increase, so will the need for more of it to come from renewable resources such as wind. Each unit of electricity generated by wind helps the environment by reducing emissions of greenhouse gasses, pollutants and waste products.

But to build a wind farm, there are also many local environmental issues to take into account. That is why all wind farm developers undertake Environmental Impact Assessments (EIA), using surveys and assessments to identify all the natural, physical and human environmental factors which could be affected by the design, construction, operation and decommissioning of their wind farms. Scira Offshore Energy carried out separate EIAs for the Sheringham Shoal project's offshore wind farm and its onshore grid connection.

As part of the EIA process, Scira Offshore Energy engaged with the full range of consultees including more than 45 statutory and non-statutory bodies representing key interest and user groups in North Norfolk and nationally.

The EIA results were incorporated into Environmental Statements (ES) outlining all the wind farm's potential environmental impacts, both adverse and beneficial.

Consent to build

The ES were submitted as part of the consent applications to the relevant authorities and the following consents were received:

- *Section 36 Consent was granted by the then Department of Business and Regulatory Reform in August 2008*
- *Town and Country Planning Act approvals were received by the North Norfolk and Broadland District Councils for the onshore grid connection in early 2008*

Along with these consents, in August 2008 Scira also gained licenses under the Food and Environment Protection Act and the Coastal Protection Act, which contained environmental conditions relating to the wind farm's construction methods, timing of the work and monitoring activity.

Designed for the environment

In designing the wind farm, archaeological and environmental conditions were considered and mitigation measures incorporated. These measures included ensuring the project would:

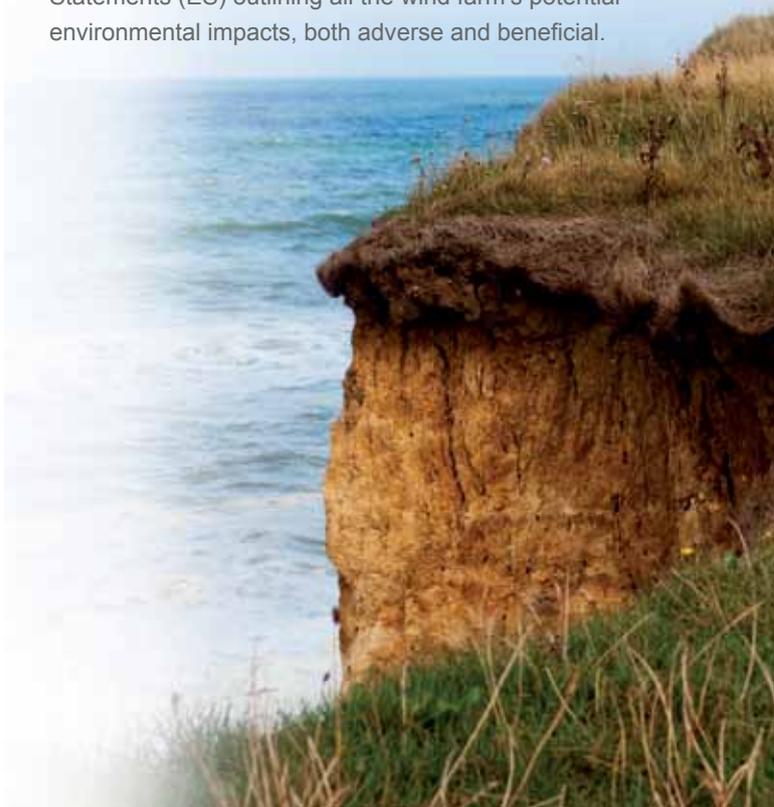
- *enable flight corridors between the turbines from the breeding grounds of local tern populations to a foraging area located north east of the wind farm site*
- *use foundations with the least environmental impact given the site's geotechnical properties*
- *consider seabed geological conditions, sediment movements and the location of marine organisms and their habitats in the routing of the export cable*
- *not increase flood risks with any onshore works*

Construction methods

The most intensive period of activity for a wind farm is the construction phase where the wind farm components are installed. For Sheringham Shoal, this began in mid 2009 with the start of the onshore cable and substation construction. Prior to any works beginning, a Newt Licence was required from Natural England to safeguard the protected great crested newt. Special fencing was erected to keep the newts out of the construction area.

The onshore cable system was mostly installed by open-cut trenching across agricultural land. However in 14 locations – landmarks, rivers, roads and woodland areas – trenching was not appropriate and a directional drilling technique was used. Following installation, there was soil reinstatement and replanting to return the land to its initial state.

Directional drilling was also used at the landfall at Weybourne beach, which is exposed to high-energy waves and tides and is subject to ongoing erosion. To avoid disturbance of the low cliffs at the rear of the beach, and the shingle bank that protects them, the cables were installed through 320m ducts ensuring the area, including the intertidal zone, remained undisturbed.



Construction methods *(continued)*

Offshore, significant consideration has been given to minimise any effect on the marine environment. Prior to the installation of the monopiles, which form the base of each foundation, rock placement was undertaken to provide scour protection and avoid a lowering of the seabed immediately surrounding the structures. Scour protection, in the form of sizeable rocks, has proven to be a popular habitat for crustaceans and other marine life.

Offshore construction methodologies adopted include using:

- *a soft-start piling technique for the monopile installation where the power and frequency of the hammering was built up slowly to minimise acoustic and other effects*
- *the implementation of pollution prevention measures to prevent any accidental spillage incidents.*

Monitoring the environment

Throughout construction, there are monitoring and assessment activities but two major focus areas are:

Birds

A two-year programme of boat-based, aerial and radar bird surveys was undertaken as part of the EIA to understand the use and activity of the wind farm site by birds. Although the surveys showed relatively few numbers of birds using or flying through the area, species were assessed in relation to their risk of collision and level of potential disturbance during construction and operation.

Bird surveys were conducted for 12 months prior to construction and will continue throughout the works, providing real field data to verify predictions of bird behaviour within the wind farm site. Vessels including the 'Fruitful Harvest' and 'Celtic Nomad' conduct regular ornithological surveys, following such species as the Sandwich and Common Terns, as they forage and fly through the site.



Marine mammals

The most common marine mammal species in the area are the harbour porpoise and common seal, although site-specific surveys indicated a low presence of both these and other species in the wind farm site. As marine mammals rely on sound to communicate and navigate, the noise from construction activities could impact any nearby animals.



To minimise potential impacts, the project adopted soft start piling and has ensured the presence of marine mammal observers throughout.

A number of vessels including the 'Observer' and guard vessel 'Reykjanes' undertook marine mammal observations throughout the foundation installation. Qualified observers used special equipment to ensure no marine mammals were in the vicinity prior to piling work being undertaken. The observers are empowered to stop work on site should any marine mammals be spotted.

In early 2010 seal carcasses with consistent injuries began washing up on Blakeney beach. Scira Offshore Energy worked closely with the police and Marine Management Organisation to identify the cause and ensure there was no relationship to the wind farm vessel activity. The cause is still unknown however no seals with these injuries have been found this year.

Operation

The end of the construction phase marks the start of the wind farm's operational life however environmental monitoring and assessment will continue including:

- *environmental surveying at pre-defined monitoring stations*
- *ongoing ornithological observations to assess the local bird species*
- *continued assessment of local fisheries*

The local environment will continue to be a key priority in everything the operator, Scira Offshore Energy, does as it aims to be an example to all wind farm operators in the environmental arena.

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The Sheringham Shoal Offshore Wind Farm is owned equally by Statoil and Statkraft through the joint venture company Scira Offshore Energy Limited.