

# Gunfleet Sands 3 - Demonstration Project Environmental Statement

Non-Technical Summary  
December 2010



**DONG**  
energy

Produced in association with

RPS

## NON-TECHNICAL SUMMARY

### Introduction

This document provides a Non-Technical Summary (NTS) of the Environmental Statement (ES) produced as part of the consent application for the proposed Gunfleet Sands 3 - Demonstration Project (GFS 3), involving the construction of two demonstration turbines off the Essex coast.

The NTS aims to provide an overview of the key findings of the Environmental Impact Assessment (EIA) carried out by DONG Energy Gunfleet Sands Demo (UK) Ltd, a wholly owned subsidiary of DONG Energy A/S (DONG), as it seeks consent for the GFS 3 turbines and associated inter-array cables. This NTS provides a description of the project, including an overview of the reasons that consent is being sought for these two demonstration turbines.

For more detailed information you should refer to the main ES. The ES describes in detail the need for the GFS 3 turbines and also the background to seeking consents for the turbines and associated electrical infrastructure.

The ES is the formal report of the EIA process undertaken by DONG into the potential impacts of the construction, operation and decommissioning of GFS 3 and assesses environmental impacts in relation to the existing biological, physical and human environments as well as identifying appropriate measures for mitigation and monitoring.

### The Applicant

In December 2006, DONG acquired the Gunfleet Sands 1 (GFS 1) and Gunfleet Sands 2 (GFS 2) Offshore Wind Farm projects from GE Wind Energy. DONG is one of the leading energy groups in the Nordic region. The company pioneered the offshore wind farm industry in Denmark with projects constructed in the 1990's. In 2002 and 2003, DONG constructed what were at the time, the world's two largest offshore wind farms; Horns Rev and Nysted.

DONG is involved in a number of Round 1, Round 2 and Round 2.5 extensions projects in the UK. Barrow, Burbo Bank, GFS 1 and GFS 2 OWFs are currently operational with a combined generating capacity of 307 MW. London Array, Lincs and Walney OWFs are currently under construction, West of Duddon Sands is consented and in development, Westernmost Rough is awaiting consent and Walney extension and Burbo Extension are in planning.

### The Need for Renewable Energy

The UK government signed up to the Kyoto Protocol and agreed to take on a reduction target of 12.5% over the period 2008-2012. The Kyoto Protocol became a legally binding treaty on 16th February 2005. The UK Government subsequently set a separate domestic goal of reducing carbon dioxide emissions by 20% below 1990 levels by 2010 and 60% by 2050.

With specific reference to offshore wind, an ambitious target of 33GW of installed capacity has been proposed by the UK Government, with the recent announcement of a third round of offshore wind farm licensing, providing the mechanism whereby up to an additional 25GW of capacity may be installed. In order to test new technologies, demonstration sites such as GFS 3 are required.



Example turbine array

### The Project

The proposed development site is located 8.5 km south-east of Clacton-on-Sea, Essex, and is situated immediately adjacent to a sandbank known as Gunfleet Sand. The GFS 3 project is located just off the southern flank of the sandbank. The GFS 1 and GFS 2 projects, which are now operational, lie to the immediate north-west of the proposed GFS 3 site. The total area of GFS 3 is approximately 1 km<sup>2</sup>.

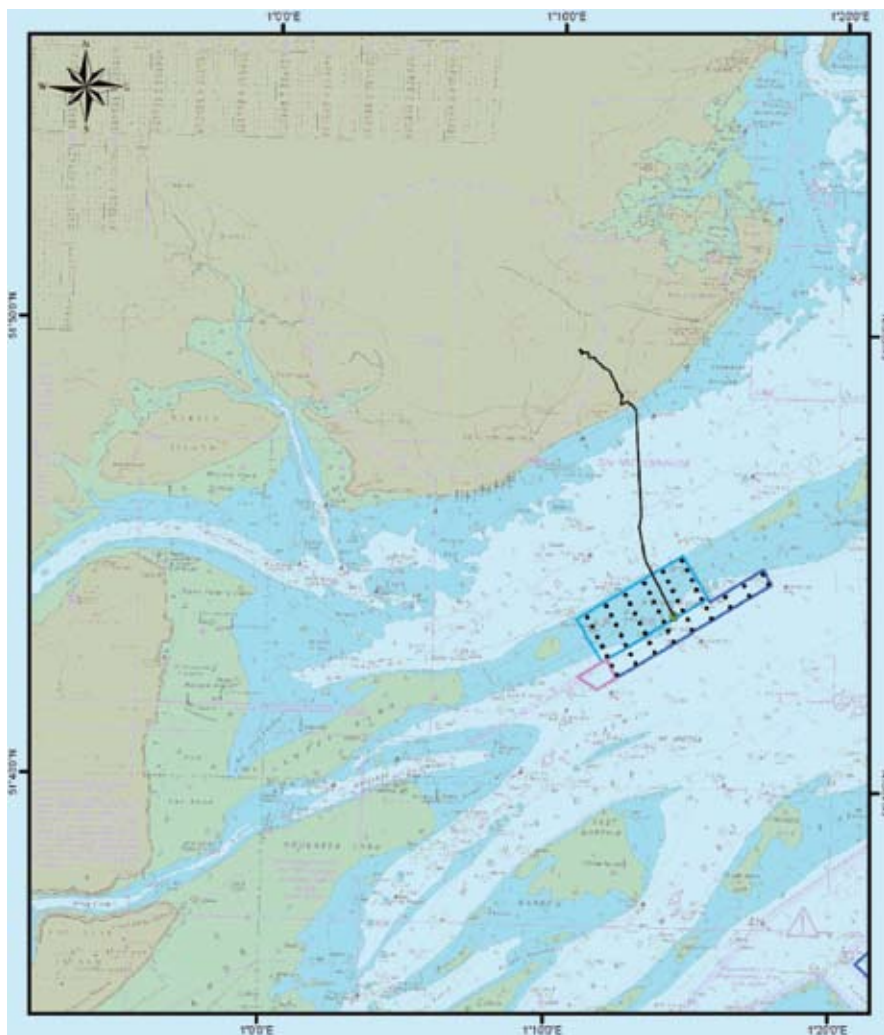
The development consists of two demonstration Wind Turbine Generators (WTG), along with associated foundations and inter-array cables. Other offshore ancillary structures, such as substations and export cables, have been constructed as part of the GFS 1 and 2 projects. It is intended that these two turbines and their associated infrastructure would be constructed during 2011 and 2012.

### Background to this Application

The Gunfleet Sands (GFS) project, which is located approximately 8.5km south-east of Clacton-on-Sea, Essex, consists of the operational GFS 1 and 2 projects. Consent was granted for GFS 1 in 2004 and the GFS 2 site was consented in 2008. The combined GFS project consists of 48 operational turbines, each of a maximum capacity of 3.6 MW. Generation capacity for the GFS project is restricted and capped at 164 MW.

In August 2010, DONG was awarded a demonstration lease site to the south-west of the GFS 2 array. The proposed GFS 3 project involves the construction of two demonstration turbines

and associated inter-array cable infrastructure. An EIA is required to support any consent application for the demonstration turbines. This NTS forms part of the ES produced via this EIA process.



Location of GFS 3 project

## Consenting Requirements

The principal licences, consents and permissions required for GFS 3 are:

- FEPA construction licence (Food and Environment Protection Act 1985); and
- Section 36 consent (Section 36A (I) Electricity Act 1989);
- CPA consent (Section 34 Coast Protection Act 1934); and
- River Works License (subject to discussions with the Port of London Authority).

## Environmental Impact Assessment (EIA) Process

Environmental Impact Assessment is a tool for systematically examining and assessing the impacts and effects of a development on the environment. The resultant ES reports on the EIA and contains:

- A description of the development, including any alternatives considered;
- A description of the existing environment at the site and surrounding areas;
- A prediction of the potential impacts on the existing human, physical and natural environment at the site and assessment of subsequent effects (including a description of methods used to assess impacts);
- A description of mitigation measures to avoid or reduce such effects;
- A description of measures to monitor the effects; and
- A Non-Technical Summary (this document).

A key point to note with regard to the scope of the EIA process for GFS 3 is the extensive data set currently available to inform the ES. This data set primarily consists of studies, surveys and assessments carried out in support of the GFS 1 and 2 ESs. This ES draws primarily upon data and impact assessments from the GFS 2 ES due to both proximity of study sites and relevance of data. In addition, in carrying out the EIA for GFS 3, the baseline and impact assessment for the GFS 2 project have been updated with data collected since the submission of the GFS 2 ES.

The GFS 2 ES assessed a total of 22 turbines, while only 18 turbines were constructed. GFS 3 will involve the installation of two demonstration turbines. The majority (80%) of the GFS 3 lease area sits within the boundary of the originally consented GFS 2 site, with a small area to the north-west that partly extends the GFS 2 boundary.

These additional turbines, therefore, lie partially within the envelope of assessment completed for GFS 2. This original assessment for GFS 2 found no impacts from the 22 turbines assessed to be prohibitively significant such that consent could not be granted.

## Consultation

Consultation is a key component of the EIA process and has been carried out during the GFS 3 project. A scoping letter, which set out the proposed approach to the EIA and also identified potential impacts of the scheme, was issued to a wide range of stakeholders in September 2010. Responses were received and formed the basis of a formal scoping opinion and these were used to guide and focus the EIA process.

In addition consultation meetings were held with consultees in order to agree the scope of assessment for key environmental parameters. Following submission of this ES for the GFS 3 project, the Marine Management Organisation (MMO) will undertake further consultation with key stakeholders on the content and findings of this ES.

### Identification of Likely Significant Effects

The potential significance of impacts associated with this proposed development have been identified through a variety of methods, listed below:

- Review of generic EIA guidance for offshore wind farms (Cefas, 2004);
- Consultation with key stakeholders via issue of an EIA scoping letter;
- Meetings with key stakeholders;
- Review of the formal scoping opinion issued by the MMO (December, 2010); and
- Experience and expertise of the EIA project team.

Impact identification and evaluation was carried out via a number of standard methods and techniques. Significance levels were assigned to each impact to provide a consistent framework for considering and evaluating impacts. The assigned definitions are set out in the table below. Where the assessment necessitated a variation in terminology, this is explained in the relevant section of the ES.

Significance	Definition
No impact	No change from baseline conditions.
Negligible	Very slight change from baseline condition. Change barely distinguishable, approximating to the "no change" situation.
Minor Adverse	The impact is undesirable but of limited concern.
Moderate Adverse	The impact gives rise to some concern but it is likely to be tolerable (depending on its scale and duration).
Major Adverse	The impact gives rise to serious concern and is judged unacceptable.
Minor Beneficial	The impact is of minor significance but has some environmental benefits.
Moderate Beneficial	The impact provides some gain to the environment.
Major Beneficial	The impact provides a significant positive gain to the environment.

Definitions of levels of significance

## SUMMARY OF ENVIRONMENTAL EFFECTS

### Introduction

The following sections summarise the potential environmental impacts associated with GFS 3 as detailed in the ES. Impacts on the following environmental parameters have been assessed, with mitigation requirements included where necessary:

- Coastal processes;
- Water and sediment quality;
- Nature conservation;
- Benthic ecology;
- Fish and shellfish resources;
- Marine mammals;
- Ornithology (birds);
- Commercial fisheries
- Seascape and visual impact;
- Shipping and navigation;
- Historic environment
- Other marine users;
- Air traffic; and
- Socio-economics and tourism.



Construction vessel and turbine

### Coastal Processes

A desk-based assessment was carried out to determine any changes the GFS 3 project would have on local coastal processes, including hydrodynamic, wave, sedimentological and morphodynamic regimes. It is predicted that the proposed construction of the two turbines and associated inter-array cables will result in *negligible* to *minor* short-term impacts upon coastal processes. In the absence of scour protection, is also predicted that localised scour will result from the installation of the turbines; however, this will not impact on the stability of the sandbank. Changes due to the operational presence of the offshore structures are considered *negligible*.

### Water and Sediment Quality

Water quality in the vicinity of GFS 3 is generally good. Changes in water quality associated with the re-suspension of sediment (including any embedded contaminants) and the use of chemical agents and fuels during construction were assessed to be of *negligible* significance against background levels. Provided a standard pollution contingency plan is developed and adhered to during construction and operational phases of the GFS 3 project, there will be a *negligible* impact upon water quality and *no impact* on sediment quality.

## Nature Conservation

There are a number of conservation designations in the marine and coastal environments adjacent to the GFS 3 site within the Outer Thames Estuary and along the Essex coast. The proposed development is also located in the Outer Thames Special Protection Area (SPA) and requires consideration of potential impacts on the conservation objectives of this site. The GFS 3 site does not support significant populations of species or habitats that are of importance to sites designated for conservation significance. The potential impacts of GFS 3 on SPA conservation objectives are considered to be of *negligible* significance.

## Benthic Ecology

Numerous surveys have been carried out to characterise and monitor the marine benthic (bottom-dwelling) environment within and around the GFS 3 site. The sea bed communities in this area are typical of the region and characterised by patchy communities of amphipods, annelids and bivalves. No species of conservation significance have been recorded in the immediate area of GFS 3 and those species present are considered to be well adapted to living in a dynamic and periodically disturbed environment.

It is predicted that there will be *negligible* impacts upon localised benthic communities from increased suspended solids and sediment deposition associated with the construction phase.

During the operational phase, it is predicted that there will be a *negligible* impact upon benthic communities through habitat loss from the turbines with a recommendation for scour protection to minimise this impact. It is likely that there will be colonisation of the scour protection and the submerged outer surface of the turbines which is predicted to have a no impact on the benthic ecology.

## Fish Resources

Surveys carried out for the monitoring program of the GFS 2 site show the GFS 3 site to comprise thornback ray, dab, flounder, plaice, common sole, pout, clupeid fish (sprat/herring), sand-eel, goby, dogfish, tub gurnard and pogge. The GFS 3 site is not an important area for shellfish.

Impacts on fish species and habitats associated with increased levels of sedimentation, deposition, scour of sediment adjacent to turbines and construction noise were considered to be of *negligible to minor* significance. Indirect loss of key fish habitats, associated with the presence of turbines and the shoaling effects of pelagic fish, were both assessed to be of *negligible to minor* significance.

It is predicted that the development of two turbines and associated inter-array cables will not significantly impact upon the fish and



Jack-up barge

shellfish resource. The use of soft-start piling will help mitigate impact from noise on local species of fish, such as herring, that may be sensitive to noise.

## Marine Mammals

Two species of seal and one species of cetacean are recorded in the vicinity of the GFS 3 site on an annual basis: common seal; grey seal; and harbour porpoise. Low numbers of marine mammals have been recorded in surveys from 2002 to 2010.

Potential effects from the proposed GFS 3 project include visual and acoustic disturbance from vessel traffic, disturbance from cable laying including reduced visibility from re-suspended sediments and the effects of noise as a result of piling operations.

Mitigation measures will be implemented to reduce the risks to marine mammals through use of marine mammal observers to detect marine mammals during installation of foundations and soft-start piling. Marine mammals have been shown to move back into areas previously affected by loud noise soon after the disturbance has halted. Because of this the effects are predicted to be *negligible to minor* and are considered short term and reversible.



Red throated diver

## Ornithology (Birds)

Boat-based bird surveys during the winter period have been carried out across the GFS 1 and 2 sites from 2003 to 2010. Aerial surveys were also carried out across this region, the latest in 2007/08. In surveys carried out over 2009-2010, a total of 15 species were recorded in the area around the GFS 3 site, of which the most common species recorded were gulls, kittiwakes, red throated divers and brent goose (in flight). Available data, including surveys during the construction period, indicate numbers of some species such as red throated diver, great crested grebe and auk species have declined within the study area.

Previous assessments have identified the wider study area of GFS to be an area of relatively low bird density. The populations of most species are small, although there are species of conservation importance. The GFS 2 assessment concluded that the overall effect on birds was likely to be *negligible/minor*. Findings from the GFS 3 assessment are consistent with previous assessments and predict that the GFS 3 project will have limited and non significant impacts on ornithological interests in the Thames Estuary region.

## Commercial Fisheries

Fishing activity in the area of the GFS 3 site is primarily made up of local vessels, with the main target species being sole and to a lesser extent skate.

Consultation with local fishermen carried out as part of the GFS 3 project EIA, showed there was little fishing activity within the adjacent GFS 1 and 2 sites. This is due to lack of quotas. Overall, impacts on commercial fisheries resulting from the proposed development range from *minor adverse to minor beneficial*.

## Landscapes and Visual Impact

The sensitivity of the regional seascapes and landscape designations are low to medium and the effects of the GFS 3 turbines are predicted to be minimal due to both the distance offshore and its location adjacent to the existing GFS 1 and 2 offshore wind farms.

A full Seascape, Landscape and Visual Impact Assessment (SLVIA) was carried out as part of this assessment and overall, the seascape and visual impacts of the development were considered *negligible*.

## Shipping and Navigation

Although the Outer Thames region has high vessels activity, the GFS 3 site is not located in an area of high shipping density. Past data from the GFS 2 navigational risk assessment was used in this assessment as well as 14-days of shipping data from 2010 from the Port of London Authority. The large majority of vessels in the GFS 3 project area are fishing and recreational vessels. Few commercial vessels transit close to the site.

The installation of two demonstration turbines within the project area is not expected to significantly increase navigational risks as passing traffic already keeps clear of the adjacent GFS 1 and 2 sites. Overall, impacts on navigations risk associated with the GFS 3 project are considered *negligible*.

## Historic Environment

As part of this EIA process, an archaeological assessment was undertaken to determine the potential for submerged artefacts, wrecks and coastal remains through a desk-based study and interpretation of geophysical data of the GFS 3 site. The assessment identified no known maritime sites and limited potential for the presence of further maritime sites. There is, however, evidence for the presence of submerged prehistoric archaeology.

Overall, the potential impacts on the historic environment of the GFS 3 site were considered *negligible* to *minor*. The adoption of satisfactory mitigation measures would ensure that the overall effect of the development would not be in conflict with historic environment policies and there would be no significant residual adverse impact.

## Other Marine Users

Other marine users identified in the GFS 3 area include renewable energy developments, marine aggregate extraction, unexploded ordnance, sailing and angling. The impact assessments carried out as part this EIA concluded there will be *no impact* on other marine users with the exception of angling, for which the impact was assessed to be *negligible*.

## Air Traffic

The proposed GFS 3 project is not in the direct flight path of any major airport. The closest facility is Clacton Aerodrome, which is located approximately 9 km to the north of the proposed site. There are also no military activities in the region. During consultation for the GFS 3 project, the Civil Aviation Authority and the Ministry of Defence indicated that it had no issues concerning the construction of these turbines. *No impacts* are predicted as a result of the GFS 3 turbines.

## Socio-economics and tourism

The GFS 3 project has the potential to generate a range of economic and social impacts. However, given the small scale of the project, the socio-economic effects are likely to be small. Key impacts identified were employment opportunities and spend into the local economy.

The construction, operation and decommissioning of the proposed additional two turbines and associated infrastructure forming the GFS 3 project is likely to exert only *negligible* or *minor beneficial* socio-economic effects.

## Summary and Conclusions

DONG Energy Gunfleet Sands Demo (UK) Ltd is applying for consent for the construction, operation and decommissioning of two demonstration turbines and associated inter-array cables. The majority of the GFS 3 site (approximately 80%) lies within the originally consented GFS 2 site.

An EIA has been undertaken that builds upon previous assessments undertaken for the GFS 1 and 2 sites in 2002 and 2007, respectively. No major adverse impacts upon the environment have been identified via this EIA process and, given the successful implementation of mitigation and monitoring measures committed to by DONG Energy Gunfleet Sands Demo (UK), combined with ongoing dialogue with interested stakeholders and the Regulatory Authorities, it is predicted that the GFS 3 project will not have any significant, long-term impacts upon the environment.



Steel monopile foundation

# Gunfleet Sands 3 - Demonstration Project

## Environmental Statement

**Non-Technical Summary**  
**December 2010**

The Environmental Statement can be viewed during the statutory consultation period until 4 February 2011 at the following locations:

Frinton Library, 59 Old Road, Frinton-on-Sea, Essex, CO13 9DA

Clacton Library, Station Road, Clacton-on-Sea, Essex, CO15 1SF

Colchester Central Library, Trinity Square, Colchester, Essex, CO1 1JB

Customer Services Manager (Front Office), Planning Services, Tendring District Council  
Thorpe Road, Weeley, Clacton-on-Sea, Essex, CO16 9AJ

Essex County Council, C/O Chelmsford Library, Market Road, Chelmsford, CM1 1LH

Requests for copies of the Environmental Statement (hardcopy £250, CD free), or additional copies of this Non-Technical Summary (free), should be made in writing to:

Gunfleet Sands 3 – Demonstration Project  
DONG Energy Power (UK) Ltd.  
33 Grosvenor Place  
Belgravia  
London, SW1X 7HY

Copies of the Non-Technical Summary are also available from the company's website at: [www.gunfleetsands.co.uk](http://www.gunfleetsands.co.uk)

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