



GUNFLEET SANDS 2 OFFSHORE WIND FARM
NON-TECHNICAL SUMMARY OF
ENVIRONMENTAL STATEMENT

June 2007





INTRODUCTION

The following is a summary of the Environmental Statement for the Gunfleet Sands offshore wind project, which is located approximately 7km south-east of Clacton-on-Sea, Essex. The project consists of the already consented Gunfleet Sands 1 project (GS1), which has consent to construct up to 30 turbines and a proposed extension, Gunfleet Sands 2 (GS2).

The Gunfleet Sands offshore wind farm project is owned by DONG Energy, who acquired the project from GE Wind Energy in December 2006. DONG Energy is one of the leading energy groups in the Nordic region and pioneered the offshore wind farm industry in Denmark with projects constructed in the 1990's. In 2002 and 2003 DONG Energy constructed the world's two largest offshore wind farms; Horns Rev and Nysted.

THE PROPOSED PROJECT

The proposed GS2 extension is a 64MW offshore wind farm comprising up to 22 turbines and associated inter-turbine cables. The total area of the GS2 boundary is 7.5km² and the site is located immediately adjacent to the consented GS1 project. Due to lease conditions set by the Crown Estate, the GS2 site has had to be located at least 8km from the nearest coast.

The proposed GS2 development will utilise the site-to-shore electricity cable and onshore electricity connection already consented under the GS1 project. Therefore, there will be no additional export cable or landward infrastructure required as part of the GS2 project.

The turbines will be installed using monopile foundations, as is proposed for the GS1 project. Scour protection will be used around the base of each turbine.

The maximum height to the blade tip of the turbines will be 135m, with a clearance of 22m between mean sea level and the lowest blade tip. The spacing of the turbines will be 435m x 890m and they will be marked appropriately with standard navigation and aviation lights.

Figure 1 shows the location of the GS2 project in the Thames Estuary.

With respect to construction timetables, it is currently proposed that GS1 and GS2 will be constructed together. It is proposed that foundation and cable installation would be undertaken in spring/summer 2008, followed by turbine installation in spring/summer 2009 with completion of the project in December 2009.



Current view of Clacton Pier (current view includes projects already consented)



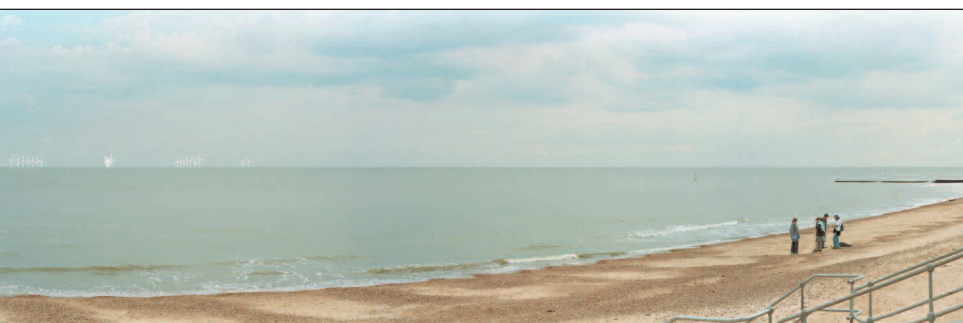
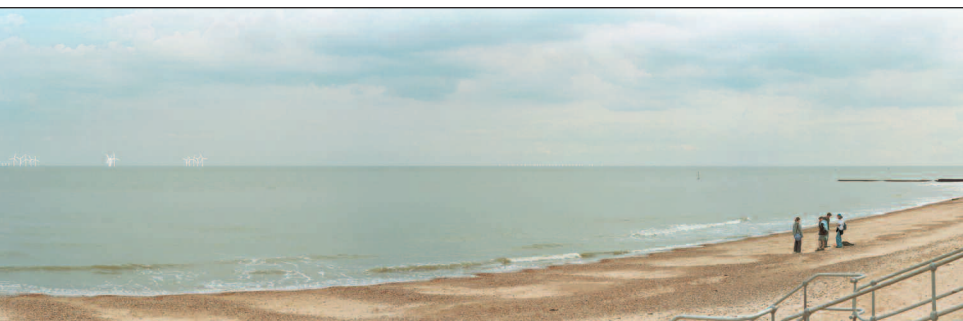
Proposed view of Clacton Pier

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THE NEED FOR RENEWABLE ENERGY

Renewable energy is an integral part of the Government's longer-term aim of reducing CO₂ emissions by 60% by 2050. To help combat climate change, the Government has set a target of 15% of electricity supply from renewable energy by 2015. In March 2007, the 27 nations of the European Union agreed to a legally binding target of 20% of all energy to be supplied from renewable sources by 2020. Increasing the amount of energy generated by renewable sources also increases the diversity and hence the security of supply.

Also in March 2007, the UK government published a draft Climate Change Bill that set out a series of measures intended to cut emissions of carbon dioxide by 60% by 2050. The draft Bill included proposals to make these carbon reduction targets legally binding.



Therefore, the development of renewable energy is vital to the Government's carbon dioxide reduction targets, and also provides benefits to the UK economy in terms of security of energy supply and economic development.

The development of the proposed GS2 project will help meet both regional and national targets for electricity generation from renewable energy schemes and will also reduce carbon emissions and as such, represents a nationally important project.



BENEFITS OF THE PROPOSED SCHEME

Once operational, the GS2 offshore wind farm will be able to provide clean, renewable electricity to approximately 45,000 households.

8 If the total project (phase 1 and phase 2) is constructed as planned, approximately 120,000 households (75,000 and 45,000 households for Gunfleet Sands 1 and 2, respectively), which is equivalent to over 20% of the households in Essex can be provided with clean electricity in the years to come. Compared to electricity generated from coal fired power plants carbon dioxide emissions to the atmosphere will be reduced by approx. 180,000 tonnes when GS2 is operational. Likewise, reductions in sulphur dioxide and nitrogen oxide (other "greenhouse gases") will amount to 2000 and 600 tonnes respectively, when wind replaces coal as the energy source¹.

THE EIA PROCESS

The European Union Environmental Impact Assessment (EIA) Directive requires an EIA to be completed in support of an application for development of certain types of projects, including offshore wind farms. An EIA has been undertaken for the GS2 project resulting in an Environmental Statement (ES), and this Non-Technical Summary provides a summary of the key findings of the EIA process.

The EIA has assessed the likely significant impacts of the proposed project on the physical, biological and human environment and, where appropriate, suggested mitigation measures to minimise the severity of any impacts.

¹ The numbers used for the calculations are taken from <http://www.bwea.com/edu/calcs.html>



CONSENTS

The GS2 project is applying for the following consents and licences:

| | |
|---|--|
| Section 36 Electricity Act 1989 | For the construction and operation of the wind farm. The scope of this consent will include the wind turbines and their foundations. |
| Section 36A (I) Electricity Act 1989 (Declaration) | Declaration under Section 36A (I) of the Electricity Act relates to rights of navigation; |
| Section 5 Food and Environment Protection Act (FEPA) 1985 Part II | For the placement of wind turbine foundations in the seabed and laying of cables between the wind turbines. |
| Section 34 Coast Protection Act 1934 | For the construction of the proposed development. The purpose of this consent is to ensure that works do not endanger the safety of navigation; |
| River Works Licence from the Port of London Authority (PLA) | The GS2 development lies within the PLA's jurisdiction; therefore a river works licence is required. |
| Section 95 Energy Act – 2004 (Safety Zones) | For the creation of specified areas which are designated as safety zones. Such zones are intended to secure the safety of the renewable energy installation or other installations in the vicinity during construction, operation, extension or decommissioning. |

CONSULTATION

Consultation is a key component of the EIA process and has been undertaken at all stages of this project. A scoping report, 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 December 2006. Responses were received from 29 of the organisations contacted and these were used to guide and focus the EIA process. Public exhibitions are also scheduled to be held in June 2007 in order to provide further information to local residents about the proposed scheme.

Following submission of this ES on GS2, the Department of Trade and Industry (DTI) will undertake further consultation with key stakeholders on the content and findings of this ES.

ASSESSMENT OF POTENTIAL IMPACTS

The potential environmental impacts associated with the proposed GS2 project have been assessed in detail via the EIA process. Standard impact assessment methodologies were used and the significance of impacts has been described using the following definitions:

The potential impacts from the construction/decommissioning and operational phases on the physical, biological and human environment are summarised in the following sections. Definitions of significance used within the GS2 ES:

| | |
|----------------------------|---|
| No Impact | No impact upon the environment. |
| 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. |

SUMMARY OF POTENTIAL IMPACTS

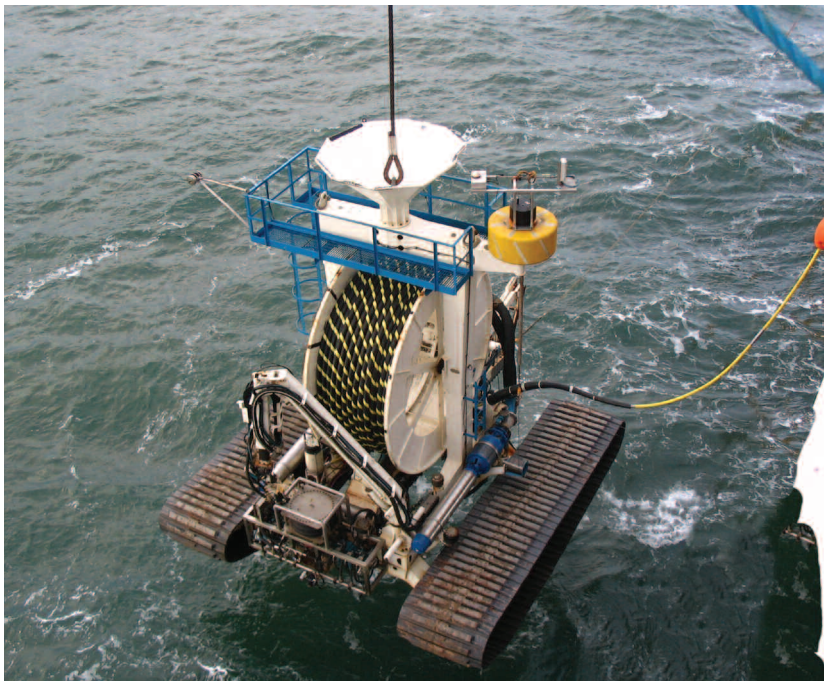
Physical Environment

Potential impacts of the proposed GS2 scheme on the physical environment have been assessed via a dedicated coastal processes assessment, which built upon existing knowledge of the physical environment gained from the GS1 project. The study concludes that the construction/decommissioning and operation of the GS2 offshore wind farm will result in negligible effects upon local wave, tide and sediment transport regimes. There will be increased suspended sediment loads during cable-laying operations, but due to the nature of the Thames Estuary, these increases will not significantly alter background levels.

It is predicted that scour pits may form around the base of each turbine possibly along with secondary scour wakes, which may represent an impact of minor adverse significance. However, it is not predicted that the formation of these features will significantly affect the overall shape or structure of the main Gunfleet sand bank. It is proposed that scour protection will be used to mitigate such scour. All inter-turbine cables will also be buried to a target depth of 1-2m to avoid exposure.

Analysis of contaminants in local sediments did not identify high levels of contaminants of any type. Therefore, it is predicted that there will be no impact upon water quality from the possible release of contaminated sediments during the construction process.

Cable installation vehicle



Biological Environment

Nature Conservation

The GS2 site does not lie within the boundaries of any designated site of nature conservation. The closest designated site is the Essex Estuaries candidate Special Area of Conservation (cSAC) which is located approximately 5km from the GS2 site. Therefore, it is predicted that there will be no impact upon existing designated sites.

The site does lie within an area identified by Natural England as possibly forming a Thames Estuary Special Protection Area (SPA). The potential impact on the possible SPA is discussed below (see "Birds" section).

Fish

The Thames Estuary supports a wide range of fish species and also provides spawning and nursery habitat to a number of commercially important species, including sole and herring. The GS2 site lies within an area identified as acting as a sole spawning ground and also lies 10km to the west of a recognised herring spawning ground on the Eagle Bank in the Blackwater Estuary.

For the GS2 project, DONG Energy propose that piling operations will not be undertaken in the period from 1st February to 1st June in order to enable species such as sole and herring to move onto spawning grounds and spawn without any potential disruption. By adopting this construction strategy, it is predicted that there will be no impact on spawning fish from piling operations.

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With respect to other potential impacts upon fish, it is predicted that there will be at most, minor adverse impacts due to the loss of potential spawning habitat and short-term increases in suspended sediment concentrations. The potential impact from EMF is being assessed by COWRIE (Collaborative Offshore Wind Research into the Environment). Conclusions are expected to be published by the end of 2007.





Red-throated Diver

Marine Ecology

A site-specific marine survey was undertaken in 2007 to gather data on the marine ecological communities within the GS2 site. This survey built upon a previous survey of the wider area undertaken in 2002. The marine communities in the GS2 area were found to be similar to those identified in the wider area in 2002 and typical of this part of the southern North Sea.

Potential impacts upon marine communities include a change in habitat due to the introduction of hard foundations into a sandy environment, short-term increases in suspended sediment concentrations and smothering from the cable-laying operations and potential changes in habitat as a result of increased scour. The assessment concluded that some minor adverse impacts may arise, but that the majority of impacts would be negligible.

Birds

The GS2 site is located offshore from a number of SPA's, including the Colne Estuary SPA and Blackwater Estuary SPA. The site also lies within the boundary of the proposed Thames Estuary SPA, which is being suggested as an SPA due to a consistent presence of wintering red-throated diver in this area. For the purpose of the GS2 EIA, the Thames Estuary has been treated as if it were already a SPA.

Aerial surveys were undertaken of the area around Gunfleet Sands in the period March-August 2006 whilst monthly boat-based surveys have been undertaken between October 2001 to February 2007. Since November 2004 monitoring surveys have been undertaken over a revised survey area which fully covers GS2 as well as adjacent buffer and reference areas.

These surveys have identified that GS2 is located in an area of relatively low bird density. The populations of most species are small, although species are present that are of conservation importance, including Red-throated Diver. The most abundant species recorded in the wind farm area during the boat-based surveys were Common Scoter, Diver species, Red-throated Diver, Gulls, and Guillemot. Beyond the actual wind farm area within the 1km and 2km buffer zones the numbers of Divers, Gulls and Guillemots recorded increased.

A systematic assessment of the potential impacts on birds arising from the proposed construction, operation and decommissioning of the wind farm, alone and in-combination with other developments in the Thames Estuary has been undertaken. Potential impacts assessed included displacement from the wind farm site due to the presence of turbines, collision mortality, habitat loss and the risk of creating a 'barrier' to migratory birds. The impact assessment process concluded that in all cases the overall effects are likely to be negligible or minor.

Possible effects upon the potential Thames Estuary SPA were also assessed. It is predicted that GS2, either alone or in-combination with other developments or activities, will have no impact upon the SPA.

Marine Mammals

Five species of marine mammals have been regularly recorded in the area surrounding the proposed GS2 wind farm; porpoise (most common and considered to be resident), common and grey seals and bottlenose dolphin and white-beaked dolphin.

Potential effects from the proposed GS2 wind farm include visual and acoustic disturbance from vessel traffic, disturbance from cable laying including reduced visibility from re-suspended sediments and, in particular the effects of noise as a result of piling operations.

Mitigation measures are proposed which are intended to reduce the risks to marine mammals by firstly preventing piling from starting if marine mammals are observed to be too close to the piling operation and secondly by starting piling with hammer blows that would not cause injury (a process known as "soft start". The piling would then build up to full power over a short period of time. By using this measure, marine mammals would be encouraged away from the piling and thus risk.

The significance of effects as a result of GS2 is therefore predicted to be no greater than minor adverse.

Human Environment

Commercial Fisheries

Commercial fishing activity takes place over a wide area of the Thames Estuary, principally by locally based vessels, a significant number of which are small vessels. Whilst a variety of species are targeted within the Estuary involving a number of gear types, within the area in which the Gunfleet 2 site is to be located, the activity is predominantly demersal trawling targeting spawning aggregations of sole and to a lesser extent skate. This activity tends to be concentrated in the deeper waters, such as those to the west and south of the Gunfleet Sands.

The period of highest sole fishing activity occurs between March and June when effort is focused on the inshore sole spawning grounds. Based upon discussions with local fishermen and Kent and Essex Sea Fisheries Committee, it is understood that between eight and twenty one locally based vessels have, to varying degrees, interests in fishing the Gunfleet Sands 2 area.

In assessing the potential impacts, the worst case scenarios have been assumed, whereby towed gears are excluded from the site during both the construction and operational phases. The assumption is made, however, that it is benign activities such as potting and fixed netting can resume within the site following the completion of construction activities.

The precise significance of any potential adverse impacts will vary for different vessels and skippers. It is not envisaged that the development will have any significant adverse impacts on steaming times or the main commercially exploited species. For those vessels that are subject to post construction exclusion, the principal impact will be a 7.5km² loss of fishing area leading to a potential minor adverse impact on a limited number of vessels.

Seascape

GS2 is located approximately 8.5km offshore of Clacton-on-Sea and will be visible from adjacent coastlines. A detailed seascape and visual impact assessment has been undertaken as part of the EIA. This study concluded that with respect to potential effects upon the seascape character of the wider area, for the majority of the study area the magnitude and significance of the collective visual effect is judged to be no more than minor significance.

There will be localised areas of moderate/minor visual effects, such as upon the nearest eastern urban coastline of Tendring. However, from the majority of the study area the magnitude and significance of the collective visual effect is however judged to be no more than minor adverse.

In conclusion, it is considered that the overall nature of visual effects will be generally neutral from the majority of viewpoints given that turbines of the already consented offshore wind farms will already be there.

Marine Archaeology

In terms of paleo-archaeological features, the area in which GS2 is located has the potential to contain terrestrial sites from the Palaeolithic, Mesolithic and possibly the Neolithic periods. With respect to designated sites, there are no protected wrecks, military wrecks of scheduled monuments within the GS2 site boundaries.

Information collated on general wrecks, obstructions and casualties within the study area showed that 10 separate wreck sites were identified in the area around GS2, of which three lay within the footprint of the proposed wind farm.

In addition to the wreck records, marine geophysical data collected over the site has identified a number of anomalies within the immediate study area, six of which exist within the footprint of the proposed wind farm.

Potential impacts on these archaeological features have been assessed and standard mitigation measure would be implemented in the form of a Written Scheme of Investigation. This document will set out the formal protocol to avoid damage to archaeological features and will be developed in consultation with English Heritage and local authorities.

Shipping and Navigation

Information on the distribution of marine traffic in and around the GS2 site has been collated via two 14-day radar surveys undertaken in March and May 2007. A formal navigation risk assessment has also been undertaken in line with recommendations set out in a guidance note issued by the Maritime and Coastguard Agency (MCA).

The risk assessment concluded that the turbines at GS2 will not significantly increase the visual impairment locally for vessels navigating in the area. Potential impacts upon marine radar will also be mitigated by the installation of a new radar on the most south-eastern turbine in the GS2 site, to replace the existing radar at Holland Haven.

Other Marine Users

Other marine users in the vicinity of the GS2 site have been identified and an assessment made of the potential for the GS2 project to adversely impact these activities. It has been concluded that there will be no impact on pipelines and cables, waste disposal sites, marine aggregate areas, military areas or oil and gas interests.

Recreational activity does take place around the site, in particular sailing and angling. Although neither of these activities will be excluded from the wind farm site once operational, there will be the potential for a minor adverse impact to arise upon angling vessels, due to the fact that a small proportion of fishing grounds will be lost as a result of the presence of the turbine foundations. However, it is also possible that the presence of new hard structures in this area may actually attract fish which could produce a beneficial impact upon angling.

Aviation

It is predicted that as long as standard aviation lighting and markings are used on the GS2 offshore wind farm there will be no impact upon aviation. Consultation has been carried out with key aviation stakeholders, including the Civil Aviation Authority, National Air Traffic Systems and London Southend Airport. None of the organisations contacted raised any objections to the proposed scheme.





Installation of offshore substation

Telecommunications

It is predicted that there will be no impact upon telecommunications from the proposed GS2 offshore wind farm. Consultation has been carried out with key telecommunication providers, including Orange, T-Mobile, BT, BBC, Cable and Wireless and Arqiva. None of the organisations contacted raised any objections to the proposed scheme.

Socio-Economic and Tourism

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The proposed GS2 project has the potential to create beneficial impacts upon local socio-economic conditions. With respect to potential local employment it is predicted that personnel required for the construction and operation of this project would be sourced by contractors appointed by DONG Energy. It is not possible to state how many of these positions could be filled by local people.

In contrast, it is possible that staff required during the operational phase for general site maintenance and management will be sourced locally, resulting in a potential beneficial impact on local socio-economic conditions.

In terms of tourism, it is predicted that because the construction works for GS2 will be temporary, limited in nature, located over 8km offshore and the majority of the large components of the project (foundation piles, blades, nacelles, towers etc.) will be transported to the site by sea, thus avoiding traffic disturbance, that there will be no impact upon tourism from the proposed scheme.

CONCLUSIONS

DONG Energy is proposing to construct the GS2 offshore wind farm, Gunfleet Sands 2 (GS2) at a site approximately 8.5km south of Clacton-on-Sea, Essex. The proposed site lies immediately adjacent to the GS1 offshore wind farm, which was granted all necessary permissions and consents for its construction and operation over the period 2003-2006.

The proposed GS2 project will be a 64MW project comprised of up to 22 turbines and will represent an extension to the GS1 project. GS1 will be built in the period from 2008-2009. If all necessary consents and permissions are granted for the GS2 site, it is proposed that both the GS1 and GS2 projects will be built together, still over the period 2008-09.

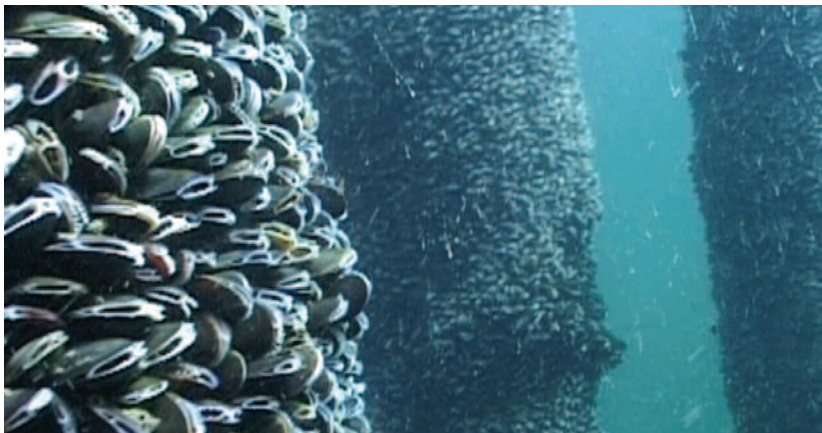
The potential environmental impacts of the proposed GS2 development have been assessed by undertaking a formal EIA that has conformed to UK and EU regulations. As part of the EIA process, consultation has been carried out with a wide range of stakeholders. Potential impacts of the construction and operational phases of the project upon the physical, biological and human environment have been assessed. The findings of the EIA process have been reported in the Environmental Statement (ES) for the project, which was published in June 2007.

The ES concluded that although the proposed GS2 project will create impacts upon the physical, biological and human environment, these are mainly judged to be of minor significance and will not result in major, long-term damage to the environment. For those impacts identified as being potentially more significant, the use of appropriate mitigation measures will reduce the impacts to acceptable levels.

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Once operational, the GS2 offshore wind farm will be able to provide clean, renewable electricity to approximately 45,000 households. Compared to electricity generated from coal fired power plants CO₂ emissions to the atmosphere will be reduced by approximately 180,000 tonnes when GS2 is operational.

Mussel colonisation on monopiles



FURTHER INFORMATION

The ES will now be subject to a public consultation exercise, co-ordinated by the DTI.

Copies of the ES (priced at £250 for hard copy or free on CD), or additional copies of this NTS (free) can be obtained from DONG Energy. A downloadable version of the NTS, plus other information on the project, can be obtained on the Gunfleet Sands Offshore Wind Farm web-site

www.gunfleetsands.co.uk

For any further information requests, please contact the following:

Gunfleet Sands Consents Manager

c/o DONG Energy

No. 1, Grosvenor Crescent

Belgravia

London, SW1X 7EF

FORTHCOMING EXHIBITIONS

Sunday 24th June 2007 - Essex Hall, Clacton Town Hall, Clacton-on-Sea.

Monday 25th June 2007 - The Frinton Community Centre, Frinton-on-Sea.

Wednesday 27th June 2007 - Jaywick Methodist Church Hall, Crossways, Jaywick.

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