KENTISH FLATS
Offshore Windfarm

Global Renewable Energy Partners

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For more information on wind energy in general visit the British Wind Energy Association at www.bwea.com

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Non-technical summary
August 2002

Introduction

Global Renewable Energy Partners (GREP) are a wholly owned subsidiary of NEG Micon, one of the world's leading wind turbine manufacturers. They have been established in order to develop windfarms around the UK and throughout Europe and are proposing to develop one such offshore windfarm at the site known as the Kentish Flats in the southern Thames Estuary.

The proposed Kentish Flats offshore windfarm is located on the southern side of the outer Thames estuary, some 8.5km due north of Herne Bay and Whitstable on the north Kent coast. The site is approximately 60 kilometres east of central London.

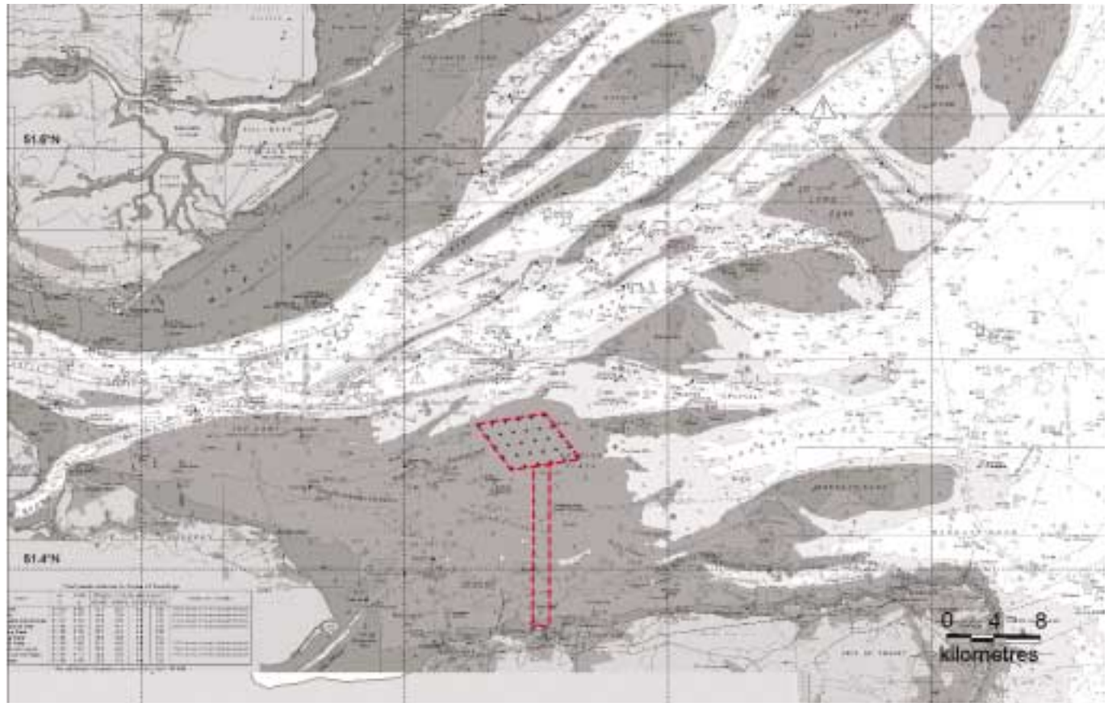
Once completed, the windfarm will be capable of generating up to 129MW of clean, renewable energy from a truly sustainable source. The generated electricity will be fed into the electricity network via a substation at Herne Bay for use in the local grid serving the needs of the communities of North Kent around Canterbury, Herne Bay and Whitstable. The development will deliver annually energy equivalent to the electricity demand of over 100,000 houses.

Subject to the granting of the necessary consents from local and national Government, construction is planned to begin in late 2003 and will be completed within one year, with the operation of all turbines anticipated by the end of 2004. The Kentish Flats windfarm will operate for 20 years, after which the development may be decommissioned and entirely removed from the offshore environment.

The Kentish Flats windfarm, together with the other proposed offshore and onshore wind energy developments, are a key element of the UK Government's commitment to reducing the emission of greenhouse gases such as carbon dioxide and seeking to reverse the trends of climate change. At present, renewable sources of energy contribute less than 3% of the UK's electricity supplies. The UK Government is now committed to a target of 10% of all UK electricity generation by the year 2010.

A detailed environmental statement, incorporating an Environmental Impact Assessment (EIA) has been produced for all of the aspects of the proposed windfarm development, in line with the requirements of the Government consenting process. This study has examined in detail the need for the proposed development; the details of the project design and construction, operation and decommissioning; and the potential negative and positive environmental and social impacts of the scheme.

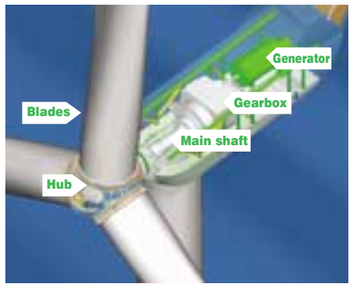
This document summarises the main findings of the Environmental Statement in a non technical format.



Red block shows Kentish Flats site and cabling route

The Project

The Kentish Flats windfarm will comprise 30 modern, efficient wind turbines capable of producing up to 4.3MW of electricity each, so that the total output of the windfarm could be up to 129MW. The windfarm will be arranged in a regular grid of five east-west rows each of six turbines, sited in an area of no more than 10km². The spacing between each turbine will be a minimum 700 metres, but in the predominant south-westerly wind direction this spacing will be about 1200 metres in order to maximise the wind capture and therefore the efficiency of generation.

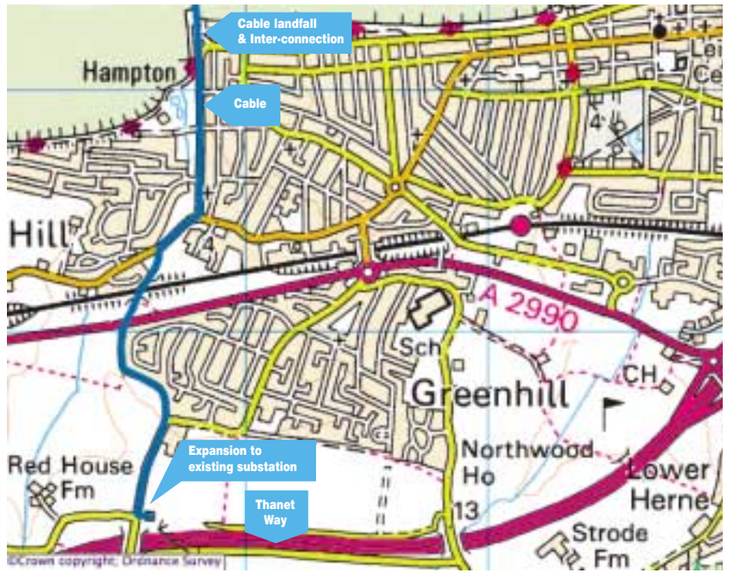


Conventional design of a modern wind turbine

The windfarm is subject to an ongoing design process by GREP in terms of both the types of turbines that will be used and the process of construction. It is important to ensure that the most efficient and appropriate turbine design is ultimately used at the time of construction. Offshore windfarm construction techniques are developing in a similar way.

However, it is expected that the maximum height of the main turbine above sea level will be 80 metres, with the maximum height of the vertical blade tip at 140 metres above sea level.

The turbines will be attached to foundations, which will be fixed to the seabed. Three options for foundation



Cabling route shown in blue on OS chart

installation are currently being considered by GREP and it is possible that more than one foundation type could be employed within the windfarm.

An offshore meteorological mast is also proposed in order to monitor conditions at the site.

Connecting the 30 turbines will be cables buried below the sea bed, used to conduct the electricity to shore and also to remotely control the operation of the turbines. Up to four cables will run from the windfarm to the proposed land fall adjacent to Hampton Pier, west of Herne Bay and these will also be buried below the seabed.

Onshore cables will be joined to the offshore cables at an underground cable jointing room adjacent to Hampton pier and will then run for 2 km to an existing substation to the south of Herne Bay. Onshore cables will be buried under road surfaces.
The existing substation will be subject to some upgrading which will involve a new building and transformers, enabling the conversion of the 33kV electricity generated by the windfarm to 132kV for distribution through the local grid.

In addition, a maintenance depot and an interpretation centre will be constructed at Whitstable Harbour. The maintenance depot will be operated by GREP and will be used as a base for the routine management and maintenance of the windfarm. The interpretation centre will be established and operated by the a local voluntary group called the East Kent Sustainability Group. The centre will provide an educational resource about the windfarm and sustainability issues generally.

Maximum dimensions of proposed turbines

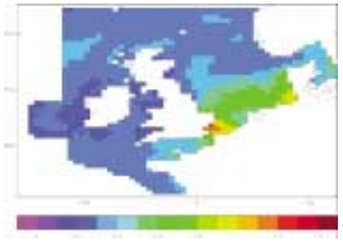
Project Alternatives

The proposed location of the Kentish Flats windfarm and the layout of the turbines has been finalised following considerable consultation with a range of interests. The site and orientation of the windfarm has been selected to minimise the environmental impacts, particularly on the local commercial fishing industry and on shipping and navigation.

A number of sites around the UK have been considered by GREP over the past few years before deciding on the Thames Estuary as an appropriate location for this development. A range of issues make this area particularly suitable including a good wind regime; a relatively sheltered location making construction easier; the apparently unconstrained nature of the site environmentally; and the location of the development close to areas of high electricity demand.

Within the Thames Estuary, a total of eight potential sites were investigated by GREP initially, involving considerable consultation with both port authorities and the commercial fishing industry, in order to try to ensure that the site selected for development would be acceptable to the main other users of the estuary.

Detailed investigations into the local electricity grid were also commissioned by GREP in order to ensure that a suitable point for the distribution of the electricity to be generated was available. Herne Bay provided such a point, due to the proximity of an existing substation to the coast, to which the windfarm may be connected.



The change, by the 2080s, in the height (metres) of the extreme sea level that has a 2 per cent chance of occurring in any given year - Medium High Emissions scenario, mid-range estimate of 30cm global sea-level rise. Illustrative example only.

The need for the Kentish Flats Project

The Kentish Flats offshore windfarm reflects the need to find alternatives to conventional electricity generation (e.g. oil, gas, nuclear). This is largely stimulated by the global need to reduce the emissions of greenhouse gases in relation to the issue of climate change in ensuring a cleaner, more sustainable future.

Climate change has become a reality over the last decade. The need to tackle the issue of climate change has been embodied in the Kyoto Protocol of 1997, which sets legally binding targets for reducing greenhouse gas emissions.

As part of Kyoto, the UK is committed to reducing carbon dioxide to 20% less that the 1990 levels by 2010. The UK Government has launched a program designed to meet the Kyoto commitments through the promotion of energy efficiency and the development of clean, sustainable sources of power generation.

The UK Government has set targets for the generation of electricity from renewables at 10% by the year 2010, and both onshore and offshore wind energy will make a very significant contribution to achieving this target.

The need for renewable energy projects such as the Kentish Flats windfarm is also recognised at regional and local levels. The Government Office of the South-East has recommended that a target of some 6.6% of the regions current electricity demand be satisfied by renewable sources by 2010. Offshore windfarms are highlighted as being best placed to help achieve these aims, with the seas off the north Kent coast identified as being the area of greatest potential for offshore windfarm development in the region.

The Kentish Flats project is one of a first round of 18 offshore developments and will have a significant role to play in helping to achieve the Government targets in relation to climate change and the commitments of the Kyoto Protocol. The Kentish Flats project alone will displace an estimated 8.7 million tonnes of carbon dioxide over its proposed 20 year life time, compared to conventional fossil fuel generation.

Visualisation of proposed Kentish Flats Windfarm from Tankerton Slopes. The Street can be seen on the left hand side of the picture

The Consenting Process

The construction of the proposed Kentish Flats Offshore windfarm can only proceed once GREP have obtained the necessary consents and signed the lease agreement with the Crown Estate. The lease will be granted for 22 years, allowing 1 year for construction, 20 years for operation and 1 year for decommissioning. The principle consents which apply to the Kentish Flats development are as follows:

- Consent under Section 36 of the Electricity Works Act 1989, issued by the Department of Trade and Industry. This consent governs the construction and operation of the main generating development.
- Licences under Section 5 of the Food and Environmental Protection Act 1985 (FEPA) issued by the Department of Environment, food and Rural Affairs. This consent governs the placement of materials in the sea and the placement of spoil at the licensed disposal site.
- Consent under Section 34 of the Coast Protection Act 1949, issued by the Department For Transport (DfT). This allows for the construction or deposit on the seabed of the main turbines and the cable installation.
- Consent under the Town and Country Planning Act 1990 for the construction of the onshore developments – the maintenance depot, the interpretation centre and the substation extension as well as the installation of the onshore cables.
- A licence from the Port of London Authority to undertake the construction of the turbines and cabling within the Ports limits.

The need for an EIA to be undertaken is defined by the European EIA Directive which is embodied in the Electricity Works Regulations, but also to support FEPA/CPA and Town and Country Planning applications.

Assembling a turbine at an offshore windfarm in Sweden, developed by GREP (above and below)

The Construction Process

GREP will construct the Kentish Flats windfarm using suitable marine contractors for each of the main onshore and offshore components. The construction of the windfarm could be carried out at any time of the year due to the relatively sheltered nature of the Thames estuary and it is estimated that it will take a total of four months for the main offshore operations.

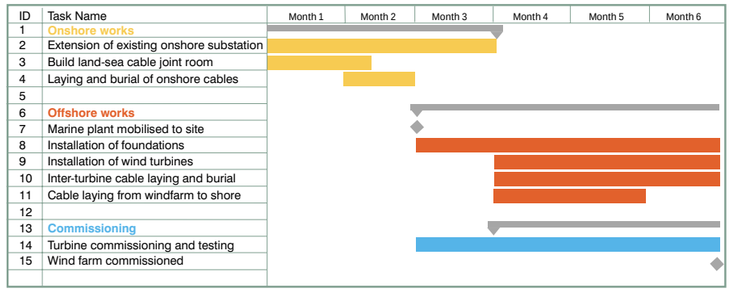
Currently, it is proposed that the project would commence with onshore works, including the extension to the existing substation and the laying of the onshore cables. Later on, this onshore activity would be in parallel with the installation of the offshore turbine foundations. It is proposed that all 30 turbines would be erected within a 12 month period although in fact this may be achieved in 4 to 6 months.

The main offshore turbine structures have three main components:

- The turbine
- The turbine tower
- The foundation

The Kentish Flats windfarm will consist of 30 modern wind turbines of the conventional appearance. The turbine components may be pre-assembled at the quayside of a suitable port, and subsequently placed on a barge and mounted on the pre-installed foundations using large cranes mounted on a second barge.

Alternatively, the components may be brought to site directly from the point of manufacture and installed without ever being landed at a port facility, using a single vessel capable of transport and installation.



Three foundation options are currently being considered for the Kentish Flats:

- Two monopile options
- Gravity foundation option

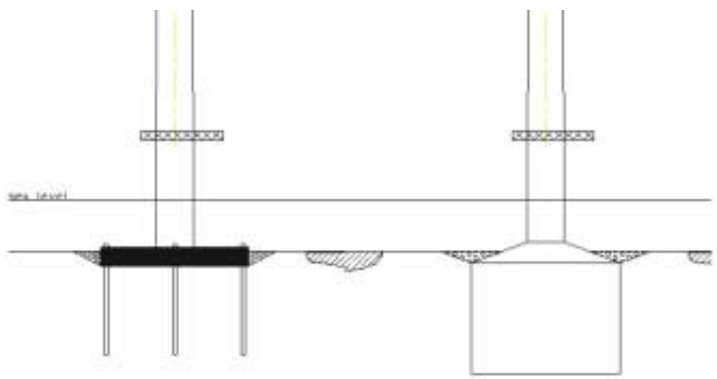
The driven monopile is a hollow steel tube with a maximum diameter of 6.0 metres, driven into the seabed using a hydraulic pile hammer to a maximum of 40 metres. The monopile may need to be drilled out to assist penetration depending on the nature of the subsea geology encountered. Alternatively a suction monopile may be used which is of larger diameter but is not hammered into the seabed.

Gravity foundations are large heavy blocks filled with ballast – with a few small diameter piles hammered into the seabed inside the perimeter of the foundation to further secure it to the seabed. In the case of gravity foundations, the seabed would be excavated in preparation for the placement of the foundation piece.

Scour protection may be required in the form of coarse gravel if significant scour around the base of the turbines occurs.

The offshore cabling used to connect the turbines and carry the electricity back to shore will be buried into the seabed using either water jetting or ploughing techniques.

Onshore cabling will also be buried under the road surfaces and across the beach using normal trenching techniques.



Drawing of gravity (left) and suction monopile (right) foundations with scour protection

Environmental Impact of the Proposed Windfarm

The following sections summarise the findings of the detailed EIA process undertaken in relation to the Kentish Flats project in relation to the effects as a source of renewable energy, the effects on the physical environment, effects on the biological environment, effects on the human environment and cumulative impacts.

Effects of the Windfarm as a Source of Renewable Energy

The assessment of the proposed Kentish Flats windfarm has identified the potential for there to be quantifiable and useful positive benefits as a result of the proposed Kentish Flats windfarm project, in relation to the generation of clean, renewable and sustainable electricity.

The Kentish Flats will make a contribution to tackling the issue of climate change through reducing greenhouse gas emissions. It is estimated that over the 20 year operating life of the windfarm, this could amount to savings of up to 8.7 million tonnes of carbon dioxide, together with significant amounts of the other greenhouse gases.

This saving of greenhouse gas emissions also provides a quantifiable and useful contribution to the UK Government's commitments to global emissions reductions and climate change control and in respect of energy diversity and security from a clean sustainable source.

In so doing, the Kentish Flats offshore windfarm will make the kind of contribution to local and regional renewable electricity generation that the regional and local policies require and, allowing for the acceptability of the environmental impacts, would make a quantifiable and useful contribution to meeting these policies.

Finally, the development, together with the other offshore windfarms will contribute to the development of a new UK offshore industry as well as providing a sustainable source of energy. Together, they have the potential to bring quantifiable and useful longer term benefits to the UK.

Effects of the Windfarm on the Physical Environment

The windfarm turbines will have localised impacts on waves and tidal currents and the associated transport of sediment in and around the structures, and to a lesser degree as a result of the cable installation. However, these have been assessed to be of low significance because of the very small changes anticipated, the localised nature of such impacts and the lack of any far-field effects.

Impacts on the turbines themselves, resulting from extreme environmental effects such as breaking waves are not expected to be significant, provided that the structures are properly designed and installed.

The surveys conducted at the Kentish Flats site and the associated assessment has indicated that there is very little significant sediment transport occurring across the site. Nonetheless, the potential for scour around the base of the turbines has been identified. It is expected that this would be naturally limited by the underlying geology, which is composed of stiff clay, but this will be subject to monitoring.

Where significant, scour pits may be subject to remediation by the dumping of gravel scour protection.

Similarly, the installation of the cables will disturb surface sediment and the underlying clay and could result in scour along the length of the cable route. This is predicted to be of low significance since the sediment will be fully re-instated following installation. However, the route will be monitored and where necessary scour protection will be applied in the form of a gravel dump.

Changes to near-field and far-field bathymetry are assessed to be of low significance because of the small amounts of sediment released during construction or through scour and as a result of the large natural changes that can occur in the Thames Estuary.

Suspended solids levels may be elevated during construction but effects on water quality are not expected to be significant since dispersion will be rapid.

However, the increase in turbidity could temporarily affect water quality in relation to the shellfish waters guideline levels, although this is dependent upon the existing baseline levels against which such impacts are judged.

Levels of contaminants in the seabed sediments have been tested and confirmed to be at acceptable levels so that impacts on water quality as a result of sediment disturbance will not occur.

In summary, significant impacts on the physical environment resulting from construction, operation or decommissioning are generally not expected to occur, although some temporary impacts on water quality could result from increases in suspended solids.

Impacts on the Biological Environment

Impacts on the animals living on the seabed as a result of the construction process are assessed to be of low significance due primarily to the small area affected by both turbine installation and cabling.

The biological communities on the seabed have been studied and it has been confirmed that they are typical of the Thames estuary and indeed the wider southern North Sea, so that ***no effects on rare species or habitats will occur.***

The placement of the new turbines could create a positive impacts by offering new structures for colonisation by marine animals, thereby increasing diversity and productivity in the region, and attracting fish to the area to shelter around and feed off these structures.

Impacts on ecology around the onshore construction sites are not expected to be significant because of the developed or disturbed nature of the sites or the low quality habitats that exist around these areas.

Impact on marine mammals will also not occur during any phase of the Kentish Flats scheme since these species are not commonly recorded in this region, or where they are seen in the case of seals are not considered sensitive to the potential effects of the project.

Impacts on fish and shellfish species are also not expected to be significant. The loss of seabed habitat is not considered significant and does not generally effect any spawning or juvenile nursery areas. Instead, fish would be expected to show some avoidance to areas of disturbance during the construction phase, particularly in response to noise generated by piling operations.

Example of biological survey work carried out at the Kentish Flats

Example of common oyster found in the Southern Thames Estuary

Impacts could occur on a minor herring spawning ground just offshore of Herne Bay as a result of the cable installation if this occurs in the spawning season between February and early May. Mitigation has been offered through the use of alternative installation technology which minimises the creation of suspended solids and this is assessed to reduce the significance of this potential impact.

The new structures could act to attract fish into the area and could even increase fish diversity and productivity in the longer term. This could have knock on effects for both commercial and recreational fisheries.

The use of the windfarm site by bird species has been investigated by site specific bird surveys which will continue throughout the planning and construction phase. The assessment of impacts on bird species has concluded that significant effects on the feeding, roosting, breeding or migratory behaviour of all bird species, or through bird disturbance or collision, will not be significant, due principally to the small numbers of birds recorded from the site.

A possible exception to this is the potential for feeding diver species to be disturbed during the construction phase as a result of piling operations, if these occur in the main diver season between November and March. Suggestions for mitigation such as avoiding this sensitive season, or stopping piling should a given number of divers be observed within 400 meters of the piling operations will reduce this impact so that it is not considered significant.

Cabling across the beach and the surrounding area will occur adjacent to an SPA site. The noise generated by these operations could disturb the important wading bird species at this site during their roosting behaviour and during their main overwintering period. Mitigation is offered, suggesting avoiding this most sensitive period, or alternatively avoiding noisy construction operations during the key roosting period 2 hours either side of high water. This will reduce this impact so that it is considered insignificant.

Numerous sites around the Thames Estuary coastline are designated for their conservation interest. ***No direct impacts on any of these sites will occur as a result of construction operation or decommissioning,*** with the exception of the potential impacts on the bird species identified above, and which have been suitably mitigated.

In summary, impacts on the biological communities, marine mammals, fish and shellfish species, birds and conservation sites as a result of operation, construction and decommissioning of the Kentish Flats windfarm are not generally considered significant. Where construction may have some impacts these have been suitably mitigated so that the residual impacts are considered insignificant.

Impacts on the Human Environment

Impacts on Commercial Fishing

The Local fishing fleets of the Thames estuary are generally composed of small inshore vessels but comprise an important source of employment for the region. Whitstable in particular is famous for its oysters, which are caught from an area to the south of the proposed windfarm site.

A site specific study of fisheries activity has been conducted in order to assess the potential impacts on commercial fisheries. This study has indicated that the windfarm site is not a focus for any fishery, although it may be fished on occasion.

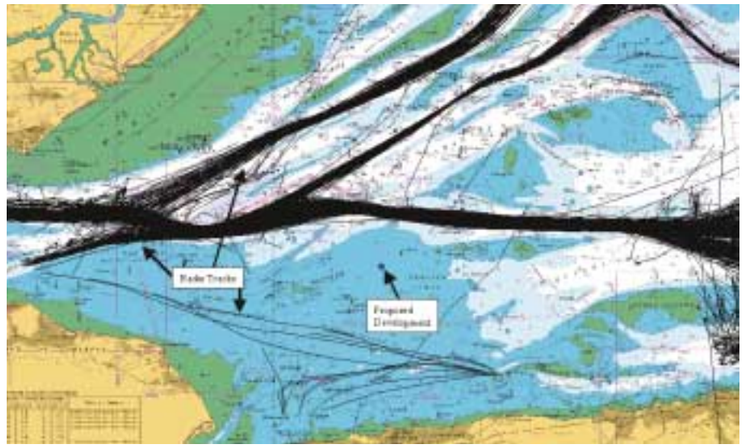
Impacts on the local fleets could occur during the construction phase, since it will be necessary to impose an exclusion from a 2km^2 area during turbine installation. However, this will be a temporary exclusion only, and since the windfarm is not a focus for fishing activity, impacts on the local fleets will be limited. A similar exclusion would be required during decommissioning.

Impacts during operation are not expected to occur, since ***the windfarm will not be subject to any exclusion so that fishing will be able to continue between the turbines.***

In fact, the turbines could act to aggregate fish and thereby increase catches for the local fishing fleets in the longer term thereby providing a potentially positive impact.

Care will be taken following construction to ensure that spoil or construction debris is not left on the seabed in order to avoid any impacts on fishermen using bottom towed fishing gear.

A sensitively sited windfarm should not interfere with migratory birds



Trace of major navigation routes across the Thames Estuary (source: safetec.2002)

Impacts on Shipping & Navigation

The Kentish Flats windfarm site does not lie within any established shipping routes although the site may be crossed very occasionally by small freighters as well as small leisure and fishing vessels. Impacts on shipping routes and the safe navigation of the large amounts of shipping entering the Thames ports are not, therefore anticipated. The turbines will be suitably lit and marked, and their location marked on navigational charts, in order to ensure that this is the case.

Site specific studies on the effects of the turbines on marine radar and radio systems have also confirmed that impacts on these systems will not be significant.

Impacts on Archaeology

The construction of the Kentish Flats windfarm has the potential to impact on items of archaeological significance during both the onshore and offshore phases.

A site specific review of this issue has confirmed that there is a high potential for archaeological finds both offshore and onshore, but a detailed process of mitigation and monitoring during the construction phase is offered in order to ensure that such impacts do not occur.

Impacts on archaeology as a result of operation or decommissioning would not be expected to occur.

Socio-economic Impacts of the Windfarm

The windfarm will not have any adverse social impacts for the local populations of the region. Instead the development will provide some definite positive impacts locally, regionally and even nationally.

The scheme will involve an investment of some £120 million and is estimated to create up to 67 full time jobs during the construction phase, with a further 5 to 10 full time jobs during the operational phase.

Furthermore, some of the major components will be manufactured in the UK and this will have a very significant impact on jobs and investment elsewhere in the UK.

This development also represents the first step in the development of a major new offshore industry which will provide much wider benefits both regionally and nationally.

Impacts on Tourism & Recreation

In the short term, the construction phase will involve the exclusion of offshore recreational activity such as sailing from the site, although this will be small scale and temporary and is not considered significant. Similarly, the installation of the cable across the beach could disturb amenity use nearshore and on the beach itself, particularly if it occurs during the main summer tourist season. Again this will be short term and temporary, but mitigation has been offered in attempting to minimise such impacts.

In the longer term, adverse impacts on the local tourist industry is not expected based on experience of such developments in other countries. Indeed, ***the windfarm could well provide a positive impact for tourism, acting as a new attraction for visitors to the area, attracting yachts and pleasure boat trips.*** The interpretation centre at Whitstable Harbour would similarly be expected to provide a new attraction for visitors to the town.

Impacts on Other Uses of the Thames Estuary

Impacts on cables and pipelines, dredging and spoil disposal, oil and gas operations, aggregate dredging operations, and MOD practice areas in the Thames Estuary will not occur because of the distance between such operations and the windfarm.

Impacts on Traffic

The construction phase will involve the transport of major components to the port used as a construction base. This could involve road transport of the tower sections, foundations and turbines. In addition there will be the delivery of minor components and the movement of construction personnel.

Alternatively, some or all of the major components could be delivered by sea to the construction quay, or even direct to the windfarm site for immediate installation.

In any event, the fact that the construction will be conducted from a major port with good access to major road networks, and which typically handle many HGV movements daily, means that impacts on local traffic would not be expected.

Onshore cabling will result in some temporary disruption of the local road network, although this will be a moving operation so that this disruption would be minimised. Nonetheless, a range of mitigation is offered in order to ensure proper traffic management and minimise any effects of this construction phase.

Impacts on Airports & Aviation

Windfarm turbines can also affect the operation of aviation radar and the safe approach of aircraft to airports. In relation to the Kentish Flats, detailed studies have indicated that impacts on military or national air traffic control will not be significant.

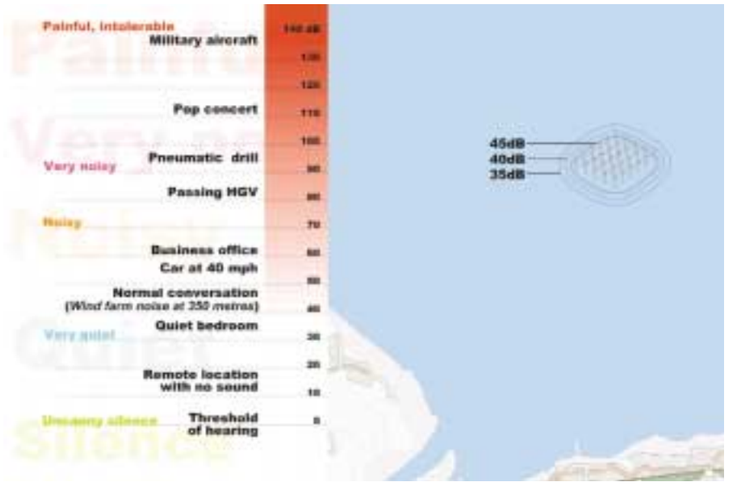
Impacts on Southend and Manston airports could occur as a result of the turbines being visible on the radar systems but these are not considered to significantly affect the safe operation of these airfields.

Impacts on Television Reception

Detailed studies into the potential effects on television reception has indicated that for the vast majority of residents on the North Kent coast, including those at Whitstable, such effects will not occur.

For those Herne Bay residents receiving their signal from the transmitter at Sudbury, some deterioration of signal is possible, although it is not certain that any Herne Bay residents actually receive these signals.

Visualisation of proposed Kentish Flats Windfarm from Bayview Road



Noise studies have shown that if you are more than 1/2 km from the windfarm, you will not, be able to hear the turbines

Nonetheless, where such effects do occur, mitigation has been offered which will entirely remove this impact.

Noise Impacts Arising from the Scheme

Of concern for many people when considering windfarm development is the noise generated, particularly during the operation of the turbines, but also resulting from construction.

In the case of the Kentish Flats, the potential noise from the operation of the turbines has been subject to modelling using advanced software. This has shown that ***the noise from turbine operation will be completely inaudible at a distance of 5 km from the windfarm, and will be below the background noise levels within a few hundred metres.***

Significant impacts on coastal populations as a result of operational noise will not, therefore, occur.

With regard to the offshore noise generated by construction, the greatest noise will be generated by the hammering of monopiles into the seabed, if this foundation solution is used. An assessment of this has indicated that this piling noise may be audible at the nearest coast above the ambient noise levels, particularly with a northerly wind. However, it has been assessed that this will not have significant impacts on local residents, based on WHO guidelines, for example through sleep disturbance. Of course, it is possible that piling will not be used, and in any event each piling event is predicted to take just 2 to 3 hours per pile, with the installation of the 30 turbines spread over a minimum 4 month period, although this could occur at any time of day.

With regard to the onshore components, the construction and cabling will cause some noise of the type normally associated with such operations, but this will be restricted to normal working hours and will be managed following the standard guidelines for such works.

Operational noise at the maintenance depot and interpretation centre will be minimal and in keeping with the type of noise generated around Whitstable Harbour currently.

The enlarged substation will involve large electrical plant and this may lead to an increase in operational noise levels. This has been assessed and is considered not to be significant for the nearest residents, particularly when the landscaping and blast walls which are required are taken into consideration.

Visual Impacts on Landscape/Seascape

A landscape, seascape and visual assessment has been carried out for the proposed offshore windfarm at Kentish Flats, to identify the potential visual effects of the windfarm covering an area of 30 km radius from the centre of the proposed turbine layout, using best practice guidance.

The proposed windfarm will be located approximately 8.5 km off the north Kent coast and the study area extended between the north Kent coast and the Essex coast.

The key characteristics of the seascape and landscape units have been described, and an assessment made of their sensitivity to change as a result of the construction and operation of the proposed Kentish Flats windfarm. Detailed assessments of the changes which will occur to the character of the landscape and seascape, as well as the visual amenity of the study area have been completed.

The visual assessment has identified that there may be significant landscape or seascape effects at:

- Whitstable (Tankerton)
- Herne Bay
- Reculver

Significant effects on visual amenity are predicted at:

- Whitstable (Tankerton)
- Whitstable (Bayview Road)
- Herne Bay
- Reculver

It not anticipated that there will be significant landscape, seascape or visual effects arising from the Kentish Flats offshore windfarm at any of the other locations around the outer Thames estuary.

Visualisation of proposed Kentish Flats Windfarm from the East side of Herne Bay Harbour. The end of Herne Bay Pier can be seen just to the left of centre.

Significant effects arising from the proposed off shore windfarm are therefore anticipated to be confined to the north Kent coast, occurring at the coastal resort towns and on the coastal edge where there are open sea views.

There may be significant effects on visual amenity for people boating or sailing off the north Kent coast, although the wind turbines will be seen in the context of a busy commercial sea channel.

In coming to these assessments, it should be noted that significant effects of the type described are not necessarily unacceptable.

In connection with the proposed offshore windfarm at Kentish Flats, public consultation has demonstrated that in fact the majority of respondents have shown very little concern with regard to the potential visual impacts, whilst another, smaller group do consider it a potentially significant concern. It is, then, an entirely subjective matter.

In summary, the proposed offshore windfarm at Kentish Flats will introduce a group of wind turbines into the seascape of the Outer Thames Estuary. This is one of the busiest water ways around the UK and there is constant movement of vessels of all kinds, as well as permanent installations such as the Maunsell forts and various navigational marks, and the development must be viewed in this context.

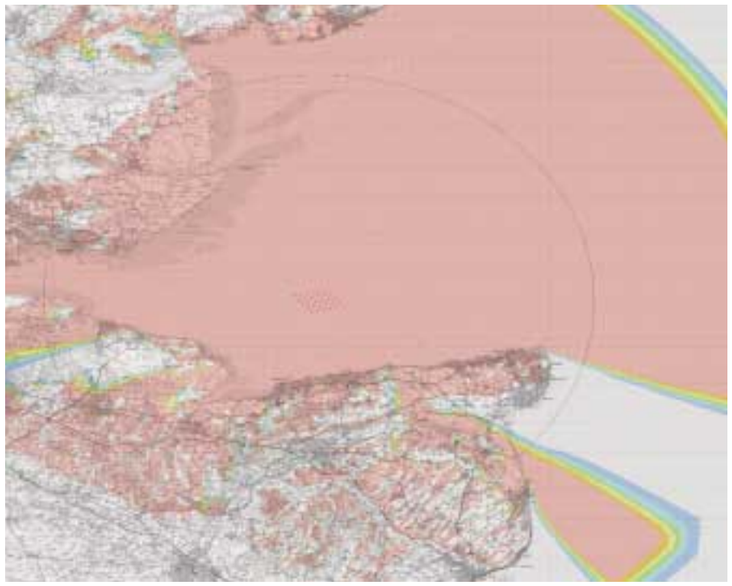
Whilst the scale of the proposed turbines will be large, they will form a group of clean lined, simple structures, which translates at nearly all viewpoints to a satisfactory and well balanced composition.

The extent to which the turbines will be seen will vary with weather conditions, but it is likely that they will be visible under most weather conditions from the north Kent coast between Whitstable and Birchington. Significant effects on landscape, seascape and visual amenity of the study area will be limited to this short stretch of coastline.

However, over most of the study area, including the most sensitive landscapes such as the AONB, it is not anticipated that there will be any significant effects, so that it is considered by the detailed visual assessment that the proposed offshore windfarm at Kentish Flats is acceptable at this location from a visual impact perspective.

With regard to the onshore components significant impacts on landscape are not expected, provided the maintenance depot and interpretation centre are designed to be sympathetic with the existing built environment at Whitstable Harbour.

The substation extension is adjacent to a local landscape designation. Any potential adverse impacts will be mitigated through suitable landscaping and planting, and indeed this is considered to potentially result in a positive improvement to the landscape quality in this area.



The pink shading shows the areas where between 26 and 30 turbines will be visible at blade tip or lower level. The orange shows where between 21 and 25 turbines can be seen. The order goes down in groups of 5 to the bright blue which shows where only between 1 and 5 turbines are visible at blade tip or lower level.

Cumulative Impact Assessment

There is a requirement to assess the potential impacts of the proposed Kentish Flats offshore windfarm in combination with other windfarm developments and also cumulative impacts from other operations. The EIA process has investigated these potential impacts based on the limited information available on such activities.

In terms of other windfarms, there is currently only one other planned development in the Thames Estuary region, that at Gunfleet Sands off the coast of Clacton-on-Sea, some 30km north of the Kentish Flats, where it is proposed to construct 30 turbines.

The cumulative impact assessment has investigated the potential in-combination effects on the biological, physical and human environments. In all cases, potential cumulative impacts have been found to be insignificant and in most cases these projects can not act in-combination at all.

In the case of potential cumulative visual impacts, the detailed visual assessment has included a viewpoint on the Essex coast selected to examine the potential for such effects. This assessment has clearly identified that there will not be any significant cumulative landscape, seascape or visual effects, largely due to the distance between the two proposed offshore developments.

With regard to the potential future development of other windfarms in the region, it is not currently possible to undertake detailed assessment for such unknown developments. However, in any case these projects would be subject to the same EIA and consenting process as that applied to the Kentish Flats, and would be expected to undertake a detailed cumulative impact study. Such developments will not occur as a result of the presence of the Kentish Flats project but instead because the region offers a suitable environment for such developments.

With regard to potential cumulative effects arising from other types of operations, the potential effects of cable laying, fishing, shipping and dredging have been investigated. In all cases, the assessment has concluded that no impacts will occur, mainly as a result of the lack of such developments, the distance between these operations or the small effects of such developments on the environment.

The key cumulative effect that will occur will be as a result of the cumulative generation of clean, renewable, sustainable electricity from the proposed 18 offshore windfarms around the UK, and indeed in-combination with all other renewable energy projects. This will lead to a cumulative impact on air quality, reducing greenhouse gas emissions and representing a significant, cumulative effect on the targets set by the UK Government.

Mitigation and Monitoring

In assessing the potential environmental impacts of the proposed Kentish Flats windfarm, a number of potentially significant impacts have been identified, particularly during the phase of construction when disruption will be greatest. In all cases, mitigation has been offered which will reduce these impacts to an acceptable level.

The following summarises the mitigation proposed for the Kentish Flats project. In addition, monitoring of the environment is offered in some respects in order to confirm these assessments or assess the need for the proposed mitigation and in some cases simply to add to the knowledge of the environment for future offshore windfarm development.

Built-in Scheme Mitigation Measures

A number of mitigation measures have been designed into the scheme by GREP which serve to avoid or reduce certain environmental impacts including the initial siting and orientation of the windfarm with due regard to environmental concerns including the local fishing industry and the impacts on shipping and navigation. The site also lies outside of any designated conservation area. The methods for cable installation and the provision of scour protection where required, for example, also demonstrate an understanding of the potential impacts of the scheme and have been designed to mitigate potential impacts on the environment. A number of other built-in mitigation measures are described more fully in the full Environmental Statement.

Visualisation of proposed Kentish Flats Windfarm from Margate Harbour

Recommended Additional Mitigation

A range of additional mitigation is offered following the EIA process. These are presented in full in the Environmental Statement but include, but are not limited to:

- Control of pollution from offshore operations
- Minimising the creation of suspended solids, particularly during cabling in order to reduce water quality and marine ecology impacts
- Reducing to a minimum the areas affected by the construction operations in the most sensitive environments
- The proper re-instatement of all disturbed areas in order to allow physical and biological recovery
- Avoiding where possible ecologically sensitive periods, or else carrying out operations in a sensitive manner
- The management of the construction exclusion zone in order to minimise impacts on fishing and offshore recreation interests
- The remediation or removal of any obstructions left on the seabed in order to minimise longer term impacts on fishing interests
- The proper marking and notification of the turbines to minimise impacts on safe navigation under all conditions
- The sympathetic design and where applicable landscaping of the onshore components
- Where impacts on television signals occur in Herne Bay the supply of corrective measures to avoid such impacts
- The proper management of all onshore construction and delivery of offshore components to minimise disruption to local traffic

GREP gathered seabed samples to investigate marine habitats

Monitoring

As well as the range of mitigation, a range of monitoring is considered necessary following construction. This includes but is not limited to:

- The monitoring of the seabed in the windfarm and along the cable route using standard hydrographic survey methods
- Monitoring of the suspended solids before and during construction
- Possible testing of shellfish quality before and after construction
- Monitoring of the seabed animal communities following construction
- Continued monitoring of the bird populations at the site through the planning and construction phases
- Surveying of the seabed post construction to ensure that the seabed is free of obstructions
- On-site monitoring for items of archaeological significance
- The conduct of a pre-construction munitions survey in the main development area

Additional Studies / Consultation

A range of additional studies is also offered in developing the final design characteristics of the windfarm and in providing information for future windfarm assessments.

Consultation with a range of bodies should also be continued in order to ensure that the windfarm development is conducted with the full co-operation of bodies such as the local port authorities and the local fishing industry, as well as the local populations.

Concluding Statement

The results of the EIA process, and the numerous studies commissioned by GREP to investigate a wide range of issues in support of that process, has lead to the Environmental Statement concluding the following main points with regard to the proposed Kentish Flats windfarm.

1. That there is a clear need for the Kentish Flats windfarm in supplying a source of clean, renewable, sustainable energy supplying an estimated equivalent of over 100,000 homes, and that this is entirely consistent with the drive and direction of European and UK National and regional Government policy in seeking to meet 10% of UK demand by 2010 from renewable sources.

2. That the development will not result in any significant adverse environmental impacts on the Thames Estuary environment, with only a few exceptions during the construction phase, which have been subject to suitable mitigation.

3. That the development will result in a range of positive environmental and social benefits including supplying investment and employment in a relatively deprived part of the south-east, in helping to establish a new UK offshore industry and potentially providing a new attraction for the local tourist industry.

The Environmental Statement has therefore concluded that the clear need for the Kentish Flats windfarm, balanced by the low environmental and social costs of the scheme, suggests that the proposed development should be subject to consenting for all aspects.