FUTURE OFFSHORE

A Strategic Framework for the Offshore Wind Industry

dti
Department of Trade and Industry

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FUTURE OFFSHORE

FOREWORD BY BRIAN WILSON

The Government is committed to putting the environment at the heart of its decision-making. As a result, renewable energy is high on the UK's political agenda and I am pleased to say that the recent World Summit on Sustainable Development in Johannesburg also puts it high on the global agenda. In the UK the Renewables Obligation became law on 1 April this year. This important Government measure provides an assured market for renewable energy for at least the next twenty-five years. The Obligation sets tough but realistic target levels of electricity supply from renewable energy sources rising year on year to 10% in 2010. By then the value of support provided through the Obligation to the UK renewable energy industry is estimated to reach £1 billion per year. This represents a huge long-term Government commitment to renewables. We are actively considering whether we should go further and set targets beyond 2010. These issues will be explored in an Energy White Paper to be published early next year.

The Renewables Obligation will provide the impetus for a major expansion of renewable energy in general and the offshore wind industry in particular. Wind energy has come a long way from the days of the gently turning windmills of the pre-Industrial Revolution Britain. In recent years, technology has improved considerably and costs have fallen. New skills have been honed and the skill base is broadening. A small but growing industrial base (turbine components and blade manufacture) has begun to take shape in the UK. There are positive indications of a new industry finding its feet in the midst of a changing energy agenda.

The time is now right to put in place a strategy for further advancing offshore wind energy. The first phase of development is showing indications of being a great success. 20 developers have obtained agreement for leases of wind farm sites around the coast. I have already given development consent to two 30-turbine projects. Construction will begin soon, to complement the pioneering two-turbine development close to Blyth harbour in Northumberland. A further 7 applications for development consent are in the pipeline.

The wind industry has shown a keen interest to go further. My role is to ensure the planning framework is right so that developers have the confidence to move ahead and other users of the sea have the reassurance that their interests and

those of the environment are being respected. Development must be sustainable. I want to make the most of our offshore wind resources but in a way which protects ecological processes and ecosystems. This is at the heart of the Government's vision for the marine environment which we set out earlier this year in the first Marine Stewardship report "Safeguarding our Seas".

Before the next round of offshore development takes place certain key issues need to be brought into focus and clarified. The main themes of this consultation are :

- The proposed arrangements for future rounds of development leases, including the detail of the site allocation process and the proposal to focus on strategic areas.
- The specific arrangements for the next round under the existing legal framework.
- The arrangements for a strategic environmental assessment of the three proposed strategic regions prior to the announcement of the next round.
- The proposed changes to the consents process to address specific issues relevant to offshore renewable energy installations.
- The provision and regulation of offshore infrastructure for transmitting electricity.
- Recommendations for a legal framework for future offshore development, to address shortcomings and enable development to take place beyond the limit of territorial waters.

I would welcome your views and comments on the issues raised in this document.

It is in all our interests that we turn the great potential of offshore wind energy into the reality of renewable electricity for our homes and businesses.

BRIAN WILSON MP
Minister for Energy and Construction
November 2002

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EXECUTIVE SUMMARY

The UK has significant potential for the generation of electricity from offshore renewable sources such as wind power, tidal stream and waves. Tidal stream and wave power may soon be deployable on a commercial scale but offshore wind technology is already advanced to the extent that the industry is poised for major and rapid expansion.

Not only is this of major significance to the UK's ability to meet renewable energy targets, but it will also contribute to energy security through diversification of supply. A major expansion of the offshore renewables industry has the potential to bring significant investment and job opportunities both in the manufacturing and service sectors.

This paper recognises the wind industry's potential for development and sets out the elements of the framework which will be needed to ensure that it can be realised quickly and efficiently, but in a way which is environmentally responsible. The framework will ensure proper evaluation of impacts at the planning stage through strategic environmental assessment, as well as through environmental impact assessment of individual development applications.

In December 2000 the Crown Estate announced the first invitation to developers to apply for site leases for the development of offshore wind farms within territorial waters. This was the first test of potential interest on the part of industry. The response was extremely positive, with the result that there are now 20 offshore wind farms planned for commissioning by around the summer of 2005, which should supply approximately 1.4GW of renewable energy.

However, these first development plans represent only a small proportion of the available potential, and developers are pressing government to establish a framework to enable future, more ambitious plans to be considered, both within and beyond territorial waters.

The first round set no constraints on the location of proposed sites, but an upper limit of 30 turbines per site was established in order to control the initial scale of developments. The experience of the first round established very clearly the appetite of the industry for offshore wind farm development. But it also emphasised that some form of strategic planning framework would be essential to optimise the exploitation of the potential resource in a responsible way.

This is because there are many factors which play a part in determining the technical and economic feasibility of development in different locations. These include water depth and access to grid connections, which mean that some locations will have the capacity for a much greater scale of development than others. There may be opportunities for sharing offshore cabling, and co-operative planning may be needed to establish onshore grid infrastructure.

There are also many potential impacts of offshore development to take into account, such as the impact on birds and marine ecology, the visual impact, and the possible impact on other marine activities. These need to be understood and evaluated in order to make decisions on the scale of development that is acceptable in different regions.

This consultation therefore proposes a strategic planning framework as a basis for the expansion of the offshore wind industry.

It describes, in the first two chapters, the growing momentum of the industry and the unique potential for expansion in UK waters, both within and beyond the limits of territorial waters. It points to the industry's projection that 3-4 GW of new capacity can realistically be built by 2010, in addition to 1.4 GW under the first round. Together, offshore development on this scale would provide around 40-50% of the 2010 renewables target.

The third chapter introduces the legal basis for regulating the exploitation of the resource. It establishes that current legislation fails to provide a firm basis for developments beyond territorial waters, and concludes that new legislation is urgently required in order to enable the huge resource that exists beyond the territorial water limit to be exploited. It states that the Goverment intends to legislate as soon as possible, but until such legislation comes into force, the ability of developers to obtain rights for development will necessarily be restricted to sites within territorial waters.

In the meantime, however, it may be possible for developers to obtain certain exploration rights to the sea bed beyond the territorial water limit. This would have the advantage of enabling developers to conduct exploratory work with an assumption that they would be able to apply for a development licence once the necessary legislation was adopted.

The fourth chapter examines the possible arrangements for future site leasing or licensing rounds. It concludes that generally speaking, time-limited rounds will have advantages over a continuous process. It also examines the regional distribution of potentially suitable sites for offshore wind farm development, and proposes that the next development rounds should be concentrated within the three regions with the largest area of potentially suitable sites: the North West, the Greater Wash, and the Thames Estuary. The chapter proposes that the announcement of a competition should be made following the conclusion of this consultation, and the completion of a first phase of strategic environmental assessment as explained below. The target for announcing a competition is April 2003.

The consultation seeks views on a range of aspects of the competition process. These include the geographic boundaries of the proposed regions, the timing and frequency of rounds, as well as the extent to which developers should be able to propose the size and shape of the area they would wish to explore and ultimately develop.

The proposed regions extend across the boundary of territorial waters. The consultation proposes that a competition for applications for development leases within territorial waters should be supplemented by a competition based on similar principles for exploration licences beyond the limit of territorial waters.

The consultation summarises, in chapter five, the potential impacts of future offshore development on all aspects of the environment including the visual impact, as well as the potential impact on other marine industries. Some of the impacts will be of local significance and these will be assessed with development applications through an environmental impact assessment.

Other impacts however will be of more regional significance and some will be linked with the scale of development, so that the impact will be cumulative and related to the scale of development within the region. It will therefore be important to look at the potential impacts on a regional scale to enable decisions to be made as to the acceptable and appropriate level of development within a region. This needs to be done before an announcement can be made about future rounds, as this assessment should play a part in shaping the nature and scale of these round.

Chapter six explains how regional impact assessment on these lines will be achieved through strategic environmental assessment (SEA). An SEA has been commenced, focussing on the three strategic regions proposed for the next round, and spanning the boundary of territorial waters. The first phase of the SEA is due to be completed by early 2003. During this period the major risks and uncertainties of future offshore development should be identified and work programmes identified or undertaken to provide data to reduce them. This first SEA work will therefore inform the next round.

Chapter seven outlines the statutory consenting process, through which development applications will be considered in relation to UK policy aims and international obligations. The consenting process ensures that each development decision is made on the basis of a comprehensive balanced consideration of impacts, both positive and negative. Whilst closely linked, the focus on each development decision is therefore narrower than the SEA process which informs the broader policy and strategic framework.

The consultation identifies areas where specific improvements might be made to the consents process for offshore wind farms. It proposes how these improvements might be achieved, through streamlining the administration, or through legislative change. The closely-related Review of Development in Coastal and Marine Waters is looking more widely at the regulatory regimes for coastal and marine development. The more general conclusions and recommendations of this consultation will feed into the recommendations of the wider review.

Chapter eight addresses considerations in relation to the provision and regulation of the offshore electrical cable infrastructure, and requests views on specific proposals.

Chapter nine summarises the proposed timetables for the first phase of the strategic environmental assessment programme, and subsequent future rounds for offering developers security over sites for exploration and development.

Request for comments

Comments and views are invited on any of the issues raised in the document. The specific issues on which we would welcome comments and views are indicated throughout the text and for convenience are also listed at Annex A.

Responses must be received by 18 February, 2003, preferably by e-mail to offshore.windfarms@dti.gsi.gov.uk, or by post to:
Caroline Roberts,
Licensing and Consents Unit
Energy Group
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Please include a name and postal address with any e-mail responses. Queries concerning the content of the document should be addressed to Caroline Roberts or Cathy Allen (telephone 020 7215 0497). Further copies of the document can be obtained by telephoning the DTI Publications Orderline on 0870 1502 500 quoting the reference number: URN 02/1327. The document can also be found on the DTI website at www.dti.gov.uk/energy/leg_and_reg/consents/future_offshore.

Confidentiality

The Department may wish to publish responses to this consultation in due course or to place them in its library. Responses received will only be treated as confidential if a respondent specifically asks that his or her response is treated as such. Confidential responses will, nevertheless, be included in any statistical summary of comments received or views expressed.

Code of Practice on Written Consultations

This consultation is being conducted in accordance with the Cabinet Office Code of Practice on Written Consultations. The consultation criteria are reproduced at Annex B.

Regulatory Impact Assessment

An initial Regulatory Impact Assessment is included at Annex C.

1

INTRODUCTION

This consultation paper covers those parts of the UK for which DTI has energy responsibility, namely England, Wales and Scotland. The policy responsibilities and powers of the Devolved Administrations in Wales and Scotland within their territorial waters are recognised. The importance of a consistent and seamless strategic framework for future offshore development is essential. The DTI is therefore working closely with these Devolved Administrations, and colleagues responsible for energy policy in Northern Ireland, to ensure that policy formulation and the development of the consents and regulatory process reflects and achieves this. Northern Ireland has, together with the Republic of Ireland, conducted a separate assessment on offshore wind.

1.1 Strategy

The UK has significant potential for the development of a major new offshore renewable energy industry. The coastline is bordered by a rich asset of potentially suitable sites for marine renewables. It is anticipated that several new marine renewable energy technologies, such as tidal stream and wave power, will soon become deployable on a commercial scale. However, offshore wind technology is already well advanced, to the extent that the industry is poised for major and rapid deployment.

This is clear from the enthusiasm of developers and investors for the construction of offshore wind farms. In the UK there are already 20 developers who intend to commission offshore wind farms by around the summer of 2005, amounting to approximately 1.4GW of renewable energy, sufficient to provide the electricity needs of a city the size of Greater Manchester. Following on from the first round, announced by the Crown Estate in December 2000, there is a growing appetite for development on an increasing scale, with projections that a further 3-4GW can realistically be built by 2010.[1,2] Together, offshore development on this scale would provide around 40-50% of the 2010 renewables target.

Although there are many uncertainties, estimates suggest that the UK has a vast resource of potentially suitable seabed that could theoretically provide several hundred GW of electricity from offshore wind farms[3]. Apart from economic considerations, the extent to which this resource can be exploited needs to be determined through a comprehensive planning framework which properly weighs the benefits of development against the potential adverse impacts.

This process should produce recommendations or guidance on the amount of development appropriate at a regional level, on the basis of predicted impacts of a range of development scenarios. It should provide a strategic planning framework within which the merits of each development application can be considered on a case by case basis. This consultation accordingly does not seek to set development targets but rather to propose a robust planning framework which will enable development to take place as soon as possible. Such a planning framework will be essential if we are to meet renewables targets.

In establishing the framework there are many issues which need to be considered. The industry will provide a significant source of sustainable, non carbon-emitting electricity. However, the regulatory process has to identify any potential adverse impacts, and evaluate these against the environmental benefits. The impacts may be wide ranging, and, given the novelty of the industry, not necessarily fully understood at the outset. Therefore, a responsible and cautious approach will be essential so that impacts become fully understood and appropriate monitoring or mitigation measures are incorporated as conditions of the development consents.

For example, offshore wind farms will be likely to have some visual impact, although this will be related to

1 British Wind Energy Association (2002), 'Energy Policy Review: Submission by the British Wind Energy Association', September.

2 A wind farm of 1GW capacity would provide approximately 0.9% of total UK electricity consumption in 2010 assuming a 35% load factor.

3 See Table 2.2

their distance from the coast. They may pose a hazard to birds, or disturb their feeding grounds, and it is inevitable that there will be some disturbance to marine ecology. The potential effect on navigation and fishing will also need to be considered, and suitability of sites will need to be assessed in relation to access to the electricity transmission network.

Marine renewables will need to be located in areas of relatively shallow sea, so it is likely that the pattern of development will be clustered within regions, with perhaps hundreds of wind turbines spreading over areas of many square kilometres. This will give rise to a need to consider the cumulative impact of such a concentration of wind turbines within each region rather than just assessing the local impacts of each wind farm on a case by case basis. Given the possible scale of development, cumulative impacts could be significant, perhaps disturbing bird migratory routes, or affecting sedimentary processes. Consequently is important that a method for assessing cumulative impacts is incorporated in the planning process.

The planning framework therefore needs to allow all potential impacts and considerations to be fully assessed, at a strategic level, through a strategic environmental assessment, as well as locally, to ensure full confidence in the reliability of the planning process.

The consultation paper identifies the elements needed in the regulatory processes for offshore renewables. It examines the adequacy of the existing processes for site allocation and development approval, and proposes how gaps and weaknesses might be addressed through administrative and legal changes.

A key conclusion is that development will only be possible within UK territorial waters (up to 12 nautical miles) unless new legislation is enacted. Even so, this region represents a substantial resource, estimated to be just under 50% of the total[4]. A large resource also lies beyond territorial waters, particularly in the Greater Wash area, which is identified as one of three strategic areas potentially suitable for offshore wind farm development. More than 70% of the potential resource in the Greater Wash area could not be developed under current legislation, highlighting the need for new legislation.

The paper proposes a timetable for the announcement of future offshore wind farm rounds, with the next one commencing in Spring 2003. Until new legislation is brought into force, it will only be possible to offer site leases for offshore wind farm development within territorial waters. However, in the meanwhile, it is proposed to run a competition, based on similar principles, for exploration licences beyond the limits of territorial waters.

Strategic environmental assessment (SEA) will form part of the planning process for the next and subsequent rounds. The first phase of SEA has therefore been started in parallel with this consultation focussing on the three strategic regions proposed for the next rounds, all of which span the boundary of territorial waters. A report on the SEA will be issued early next year, for a further public consultation. This report will assess the predicted impacts of different development scenarios for the three strategic regions. The responses to the present

Blyth Harbour wind turbines, Northumberland coast.

4 Table 2.2

consultation and the SEA report will be considered before making an announcement on future rounds for development leases within territorial waters, or for exploration licences further offshore.

This consultation paper covers those regions for which DTI has energy policy responsibility, namely England, Wales and Scotland, but not Northern Ireland. Northern Ireland has, together with the Republic of Ireland, conducted a separate assessment on offshore wind.[5]

1.2 The advantages of marine renewables

The main driving force behind the Government's interest in marine renewables - that is, energy from wind, waves, and marine currents - is its potential benefits for climate change and energy security.[6] The climate change challenge is to limit the concentration of greenhouse gases in the atmosphere by reducing emissions from burning fossil fuels, and renewable energy is a means of doing this because it is a substitute for fossil fuels.

The major initiative on greenhouse gases has been the Kyoto Protocol,[7] which the UK and the European Union (EU) have ratified, with the UK agreeing to reduce its greenhouse gas emissions by 12.5% relative to 1990 levels for the period 2008-12.[8] That period is now less than a decade away. The Government has set out a package of policies and measures to meet the UK's Kyoto targets in its national climate change programme. The emissions reductions agreed for the first Kyoto commitment period of 2008-12 are only a modest first step towards the larger cuts expected to be needed globally if damaging impacts of climate change are to be avoided. The Government is reviewing recommendations from the Cabinet Office to set targets for 2020,[9] and from the Royal Commission on Environmental Pollution (RCEP), to set a long-term target for 2050.[10] It will set out its conclusions in a White Paper on energy policy to be published early next year. Offshore wind farms will begin to deliver greenhouse gas emission reductions within four years, and could have a major impact by 2020.

The other major benefits arise from the security that comes from a non-exhaustible source of energy, and from a diversified range of energy production technologies and fuels. Renewable energy is expected to play an important long-term role in providing electricity for households, industry and the public sector, and ultimately, perhaps, for transport as well (for example through hydrogen based fuels). Scenarios for its contribution to energy supply are being developed as part of the work on the White Paper on energy policy. The Government's immediate target is that 10% of electricity should be generated renewably by 2010, subject to the costs being acceptable. This is being achieved through an obligation on all electricity suppliers to purchase renewable electricity, and targeted support measures.[11]

While many renewables offer all these benefits, the particular advantage of offshore renewables is their potential for greater public acceptability, chiefly because of the likelihood of lower visual impact. On land, wind farms can have a conspicuous visual impact, leading to planning difficulties. Offshore, the visual impact is likely to be less significant, and the area of potentially suitable seabed much greater than onshore sites. The lower visual impact offshore will mean that it will be possible to build much larger turbines than might be acceptable on land, with capacities of 2 MW and above. This benefit will be further augmented by the higher wind speeds encountered at sea.

5 Department of Enterprise, Trade and Investment, Department of Public Enterprise (2000), Assessment of Offshore Wind Energy Resources in the Republic of Ireland and Northern Ireland.

6 Wilson, B. (2002), speech delivered to the British Wind Energy Association conference, London, April 17th-18th.

7 United Nations (1997), 'Kyoto Protocol to the United Nations Framework Convention on Climate Change'.

8 DETR (2000), 'Climate Change: The UK Programme', TSO.

9 Performance and Innovation Unit (2002), 'The Energy Review', February, Cabinet Office.

10 RCEP (2000), 'Energy-The Changing Climate', 22nd Report, June.

11 The Renewables Obligation Order 2002 (SI 2002/914) came into force on 1 April 2002.

A major expansion of the renewable energy industry has the potential to bring significant investment and job opportunities both in the manufacturing and service sectors. It represents an opportunity for UK business to maximise its involvement in renewable energy projects at home and to provide a platform for taking on projects in overseas markets. Renewables UK was launched in March 2002 to assist business to develop a world-class UK renewables industry, based on the very successful experience of the UK oil and gas industry where more than 70% of UK project content is sourced in the UK.

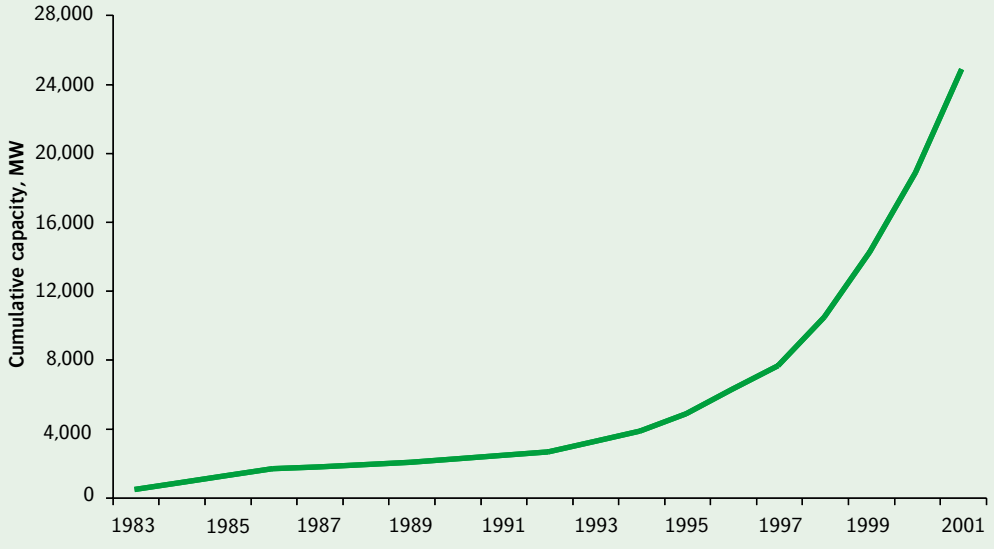
1.3 The advent of a new technology

The harnessing of power from wind through windmills is a practice adopted since ancient times, but only in the last 20 years have new materials and designs enabled turbines to be used to generate electricity. Over this period the technology has improved considerably. The reliability, efficiency in the use of the wind, and power output per turbine have all increased, and the cost of installing and running turbines has fallen to a fraction of former levels. As a result the world volume of sales has risen exponentially, as shown in Figure 1.1. Techniques for offshore engineering have also progressed, and this is an area in which the UK has a wide skill base owing to its experience of the oil and gas industry in the North Sea. Consequently, it is now cheaper than ever to build turbines offshore to access the higher wind speeds found at sea. Harnessing offshore wind energy is still a relatively expensive way to generate electricity. However, it is expected that costs will fall quickly, as discussed in the next chapter, and the Government is therefore making preparations to enable a large scale development of the industry to take place.

1.4 Developing a policy for offshore renewables

The Government is committed to encouraging renewable energy generation, integrating energy policy as one of the key policy measures to address climate change. In practice, the regulatory framework that is necessary to ensure a responsible approach to the development of a new offshore renewable energy industry involves a number of government departments with a range of policy responsibilities. Energy policy is the responsibility of the Department of Trade and Industry (DTI), whereas the Department

Figure 1.1: The rapid development of onshore wind worldwide



Source: based on data from BTM Consult ApS

for Environment, Food and Rural Affairs (Defra) has stewardship of climate change policy, but also holds policy responsibility for fisheries, marine nature conservation, habitats and species, and for other aspects of environmental protection. The Department for Transport (DfT) oversees navigation both on the sea and in the air; the Ministry of Defence (MoD) represents defence interests; and the Office of the Deputy Prime Minister (ODPM) is charged with implementation of the European Directive on strategic environmental assessment.

Given these many policy interests that are likely to be affected by marine renewables, it is essential that a truly integrated approach is adopted for both the strategic planning of this potentially significant new offshore industry, as well as for the consideration of development applications through the consenting process. This paper seeks to explain the roles and responsibilities of the various players, identify any problems or gaps with the current approach and to elicit views on how it might evolve in the future.

The consultation focuses in particular on offshore wind farms, examining the process for allocating rights to developers as well as the regulatory framework for assessing development applications. A closely related review currently underway, the Review of Development in Coastal and Marine Waters, is looking more widely at the regulatory regimes for coastal and marine development.

These two programmes of work are being closely co-ordinated, so that any conclusions and recommendations emerging from this consultation in relation to the regulatory framework will feed into the recommendations of the wider review. In taking both forward, the Government will take into account all of its international commitments in relation to energy, the use of the sea, and the environment. Of particular importance are the commitments made by Ministers earlier this year at the Fifth International Conference on the Protection of the North Sea, and the many obligations under European Directives, including those on birds, habitats, environmental assessment and energy liberalisation.

1.5 Key issues for consultation

The first round of site allocation for offshore wind farms in UK territorial waters has been a learning experience for all participants. There is now an increased understanding of the impacts of development and the engineering challenges. There have also been lessons learned about the adequacy of the current legislative basis for regulating development, the process for handling applications, and the challenges of integration across departments.

The Government wishes to put revised arrangements in place for the second and subsequent development rounds, and to do so as soon as is practicably possible. In this way, the UK can benefit from the acquisition of skills, the employment and the renewable energy production that the sector will bring.

However, the rapid development of the offshore wind farm industry must not be at the expense of unacceptable risks to the environment or to other users of the sea. It should not be undertaken in a manner which is inefficient, and the regulatory process must ensure compliance with the UK's legal obligations. The consultation therefore examines the arrangements in place, to assess their robustness, efficiency, and fitness for purpose, and proposes changes where appropriate.

This document sets out the Government's analysis, options and proposals. The conclusion of the consultation will be the launch of a strategy for offshore wind farms which will:

- establish a site allocation process which promotes efficient development;
- use strategic environmental assessment to guide the pattern and scale of development;

- ensure proper evaluation of impacts through strategic planning and consenting processes;
- provide for monitoring, mitigation and control of individual and cumulative impacts;
- deliver consistent and transparent regulatory decisions in an efficient manner.

In addition to outlining the general requirements of the planning framework, summarised above, the consultation also proposes specific arrangements for the next and future rounds for offshore wind farm site allocation.

It proposes an announcement by the Crown Estate of a second competition for site leases for development within English and Welsh territorial waters in Spring 2003, as well as offering a competition for exploration licences beyond the limit of territorial waters, as the next stage in a planned strategic approach to development.

It proposes three strategic regions, shown in Figure 4.1, within which these next rounds will focus. The rationale for this approach, and the choice of regions is explained fully in later sections. The consultation seeks views on the general approach to the process of site allocation as well as the proposed regions.

A strategic environmental assessment process is underway, focussing on the three proposed regions. The consultation outlines the SEA process, inviting views. There will be an opportunity to comment on the SEA report on the three regions early next year before a firm announcement is made on the next round.

The Government wishes the announcement on the next rounds to be made as soon as practicably possible, but acknowledges the need for a prior strategic environmental assessment. The consultation highlights the significant offshore renewable potential that exists beyond the limit of territorial waters, i.e. 12 nautical miles, particularly in the Greater Wash area. This resource cannot be developed without new legislation, although it would be possible for developers to obtain certain rights to explore the sea-bed under existing legislation.

Developers opting for such exploration rights would need to accept that there would be no possibility of allocating development rights until the necessary legislation had been brought into force, and furthermore, that no guarantee could be made about when this might happen. The paper identifies the lack of a clear legal basis for regulating development beyond the limit of UK territorial waters as one of a number of significant shortcomings that need to be addressed in the context of the future legal framework. Options for addressing these shortcomings are outlined.

In summary, the key themes of this consultation are:

- The proposed arrangements for future rounds of development leases or exploration licences, including the detail of the site allocation process and the proposal to focus on strategic areas.
- The specific arrangements for the next round under the existing legal framework.
- The arrangements for strategic environmental assessments of the three proposed strategic regions prior to the announcement of the next round.
- The proposed changes to the consents process to address specific issues relevant to the offshore renewables energy installations.
- The provision and regulation of offshore infrastructure for transmitting electricity.
- Recommendations for a legal framework for future offshore development, to address shortcomings and so enable development to take place beyond the limit of territorial waters.

2

OFFSHORE RENEWABLES: THE POTENTIAL RESOURCE

This chapter describes the components of a wind, wave or marine current installation. It also provides estimates of the potential wind resource around the coast of England, Wales and Scotland. The prospects are shown for wind resources only, because wind generation is technically and commercially much further advanced than wave and current devices. The latter are operating or planned as demonstration plant, for example Wavegen's demonstration wave power station on Islay (operating), and Marine Current Turbine Ltd's prototype underwater turbine (planned) off the North Devon coast, but it will be a number of years before commercial plant are in production. Until then, the efficiency, size and operating conditions for the plant are especially uncertain, and any resource assessment would be highly speculative.

2.1 A typical wind farm and other renewables

The typical offshore wind farm has several components, as shown in Figure 2.1. The turbine is mounted on a tower, which is in turn mounted on a platform connected to the foundations. The foundations may be a monopile sunk into the seabed, an anchored tripod, or a caisson (basket) filled with aggregate. The foundations may themselves be surrounded by rocks which protect them from the scouring action of currents. A network of cables connects the individual turbines to a separate platform containing electrical switchgear and transformers which condition the power ready for transmission, along a cable to an onshore sub-station. From the sub-station the power is conveyed directly into the onshore network.

Figure 2.1: The components of a typical wind farm

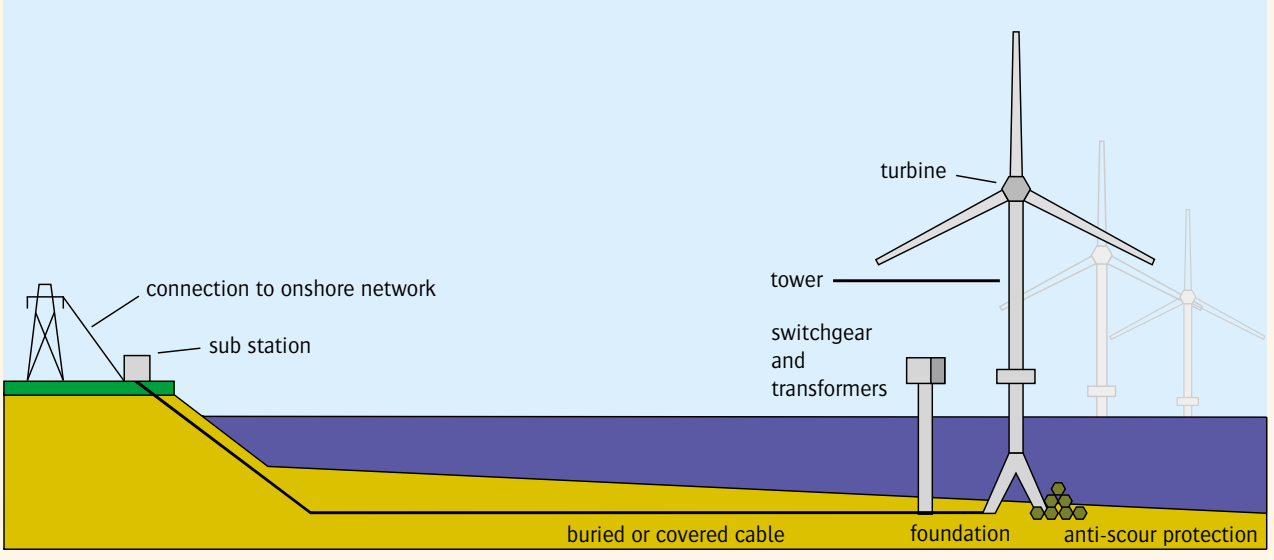
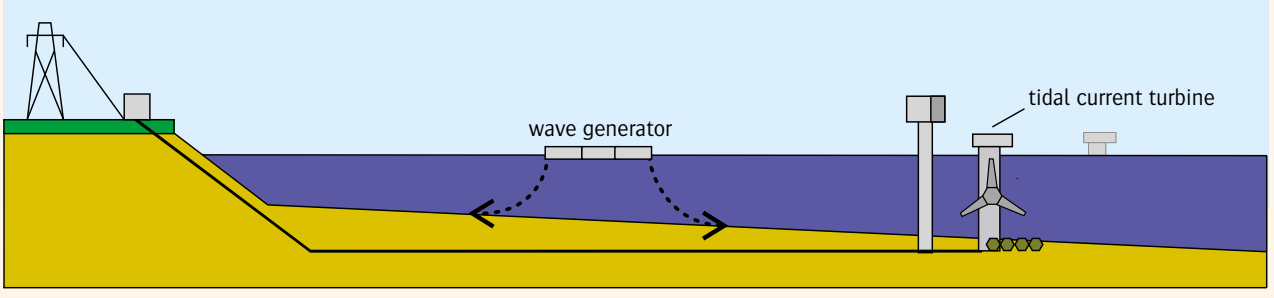


Figure 2.2: Wave and tidal current generation



Other marine renewables may share similar electrical infrastructure. Figure 2.2 shows possible arrangements for wave and tidal current machines.

2.2 Cost comparisons

The approximate costs of a new wind farm are shown in Table 2.1 and Figure 2.3. About 75% of the cost of electricity generation is the capital cost of construction, and of that, about half is the cost of the turbine. The remaining main elements are the tower and the electrical infrastructure. These figures were calculated by applying the cost distribution reported by Concerted Action on Offshore Wind Energy[12] to a figure of £1m/MW for the capital costs of an offshore wind farm. Assuming a cost of finance of 10% and a load factor of 35% (average power output divided by maximum power output), or a cost of finance of 12% and a load factor of 40%, and depreciation charged over 20 years, the total cost of electricity is about £50/MWh.

Figure 2.3: Breakdown of the costs of a typical (100MW) offshore wind farm within territorial waters

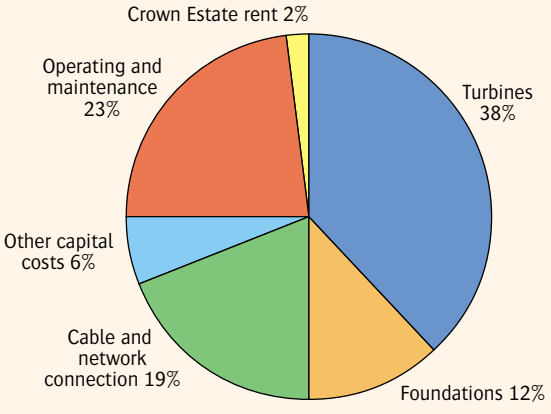


Table 2.1: Estimated costs for a hypothetical UK offshore wind farm

	Hypothetical UK wind farm
General information	
Capacity (MW)	100
Load factor (%), (a)	35
Depreciation period (years)	20
Cost of capital (%)	10
Capital cost per MW (£m)	1
Investment cost for 100MW installation (£m)	
Turbines	51
Foundations	16
Cable and network connection	25
Other capital costs	8
Total (b)	100
Annuity, per annum, (c) = calculated from (b)	12
MWh per MW per annum, (d) = 24x365x(a)	3,066
Capital costs, £/MWh, (e) = (c) / (d)	38
Total unit costs (£/MWh)	
Capital costs, (e)	38
Operating and maintenance	12
Crown Estate rent	0.88
TOTAL	**51**

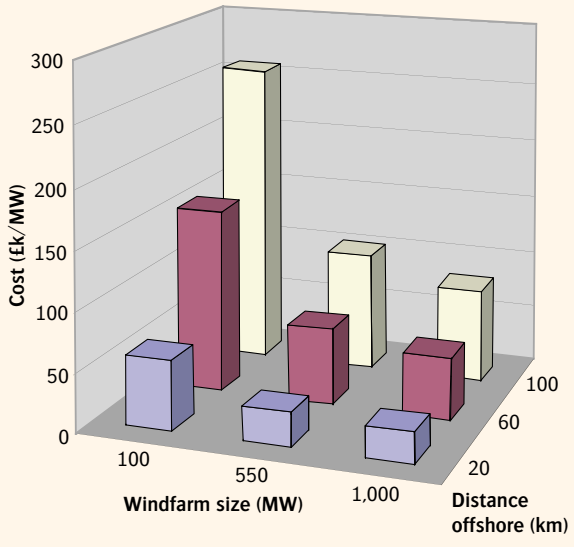
12 A consortium consisting of developers, utilities, consultants, research institutes and universities, and funded by the European Commission.

THE DISTANCE OFFSHORE

The costs will vary from site to site, depending on the seabed geology, the depth of the water and the distance from shore. The latter cost factor is particularly influential in the overall cost of smaller and medium scale installations. Figure 2.4 shows indicative costs of cabling per MW for a range of wind farm sizes and distances from shore. It shows that there are substantial economies of scale, with savings of 10% on the overall capital cost per MW if the electrical infrastructure carries 500 MW or greater over distances of more than 20km offshore.

The figure also shows that for greater distances, economies of scale in the size of the installation are more important. For a 1,000MW installation, the extra cabling cost of a location 100km offshore relative to one 20km offshore would only be in the order of 5% of the overall capital cost. It is therefore likely that the industry could consider potential sites well outside territorial waters, and perhaps as far as 100km offshore.

Figure 2.4: Indicative costs of cabling, losses and electrical infrastructure using alternating current cable export solutions



Note: These cost estimates are illustrative. The actual costs will depend on the site conditions. For the 1,000MW installation at 100km, a high voltage direct current cable solution may be preferred.
Source: Cost data supplied by National Grid. Paul Neilson, National Grid, presentation to BWEA Conference, 3rd October 2002.

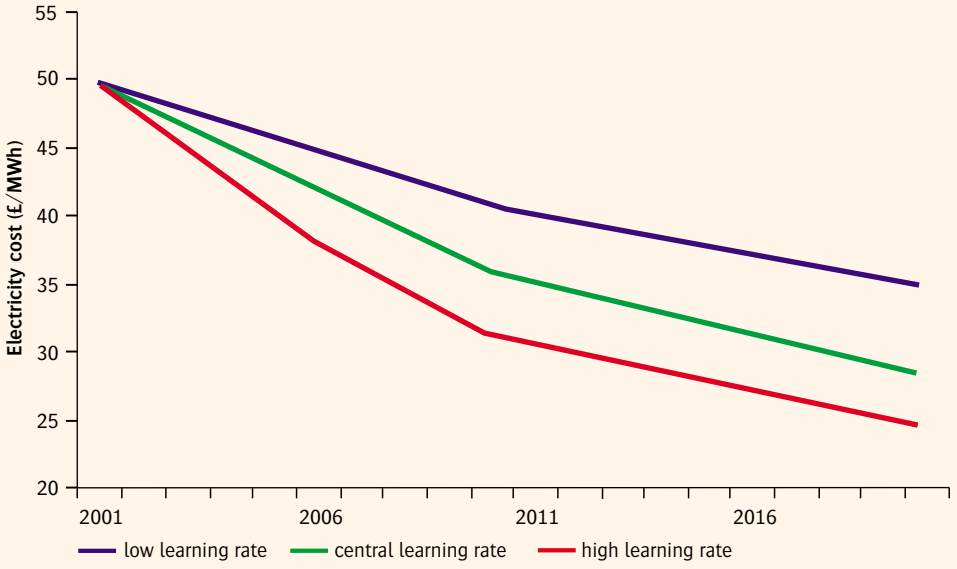
Compared with the costs of electrical infrastructure, less is known about the operating and construction costs further out to sea. An important factor is sea depth. In the first round of applications for sites, all the developers applied for sites with water depths not exceeding 17m. Most effort in mapping potential sites has focused on depths of up to 30m. However, it is expected that sites in depths of up to 50m may soon become technically feasible, although there will be higher costs associated with working in deeper waters. Already, one developer is examining a site with a water depth of 40m.

FUTURE COSTS

Predictions can be made of the potential costs of electricity generation from offshore wind one or two decades into the future. One method is to use typical patterns of changes in unit costs observed across a range of technologies (known as learning curves) and apply them to scenarios of offshore wind farm build across Europe, as shown in Figure 2.5. Although this methodology may not be particularly accurate it does provide a useful basis for future cost predictions, suggesting that the cost of offshore wind farms could fall by up to 50% over the next 20 years, to between 20 and 30 £/MWh.[13] This compares to a current new build cost for combined cycle gas turbines of 18-24 £/MWh. Some of the predicted cost reduction might arise from economies of scale in manufacture, and some from improved designs, techniques and materials.

13 Performance and Innovation Unit (2002), The Energy Review.

Figure 2.5: Scenarios for future offshore wind costs



Note: These scenarios are based on 'learning curves', which postulate that costs will fall as cumulative capacity increases.
Source: OXERA; for research on learning curves see IEA (2000), 'Experience Curves for Energy Technology Policy', and Roberts, P. (1983), 'A Theory of the Learning Process', Journal of the Operational Research Society, 24, pp. 71-79.

2.3 Development of the UK industry- the first round

In December 2000, the Crown Estate invited potential offshore wind farm developers to apply to explore and then develop sites. Applications were restricted to sites of no more than 10km^2, and to a maximum of 30 turbines. Some of those developers have now completed their site surveys and consent applications, and the first consents were issued in April 2002. Figure 2.6 shows the distribution of proposed sites around the coast.

2.4 Potential resource around England, Wales and Scotland

There is no doubt that there is a vast renewable energy resource in the marine environment available to be tapped.[14] The Crown Estate and the BWEA have brought together in a Geographic Information System database (Windbase)[15] many of the factors that will have a key role in affecting the development of the offshore wind farm industry. The data sets include the depth contours around the UK, current sea use and environmental factors. It appears clear, however, that sea depth will be a major factor affecting economic viability and for the next few years the majority of development will be concentrated in the area between 5m and 30m. The map from Windbase overleaf shows the resource between 5m and 30m water depth, and between 30m and 50m, both within and outside territorial waters.

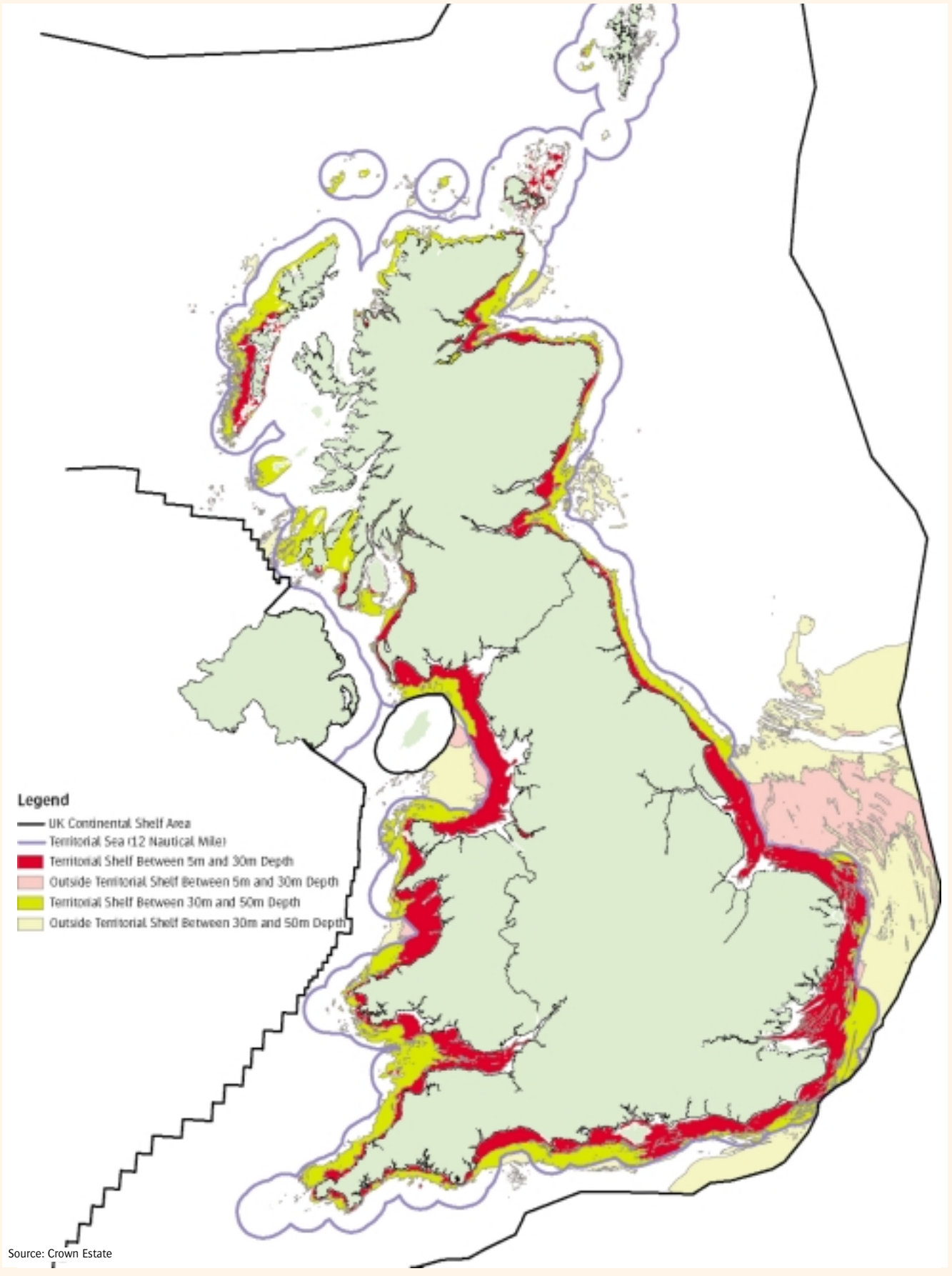
14 The technically accessible wind resource alone was estimated to be 100 TWh/yr at under £45/MWh in 2010, ETSU (1999). The House of Commons Science and Technology Select Committee's Seventh Report, Wave and Tidal Energy, 2001, quoted resource estimates of 50 TWh/yr from offshore wave and 36 TWh/yr from tidal generation. The PIU's Energy Policy Review paper suggested a resource potential of 700 TWh/yr from wave and tidal power. Earlier this year, Greenpeace suggested that 30 GW of offshore wind capacity might be possible by 2020.

15 Windbase can be accessed on the Crown Estate website at www.crownestate.co.uk

Figure 2.6: The first round of proposed offshore wind installations.

Source: Crown Estate

Figure 2.7: Prospective areas for offshore wind installations



Source: Crown Estate

These mapping data have been converted into potential energy resources, as shown in Table 2.2. The table identifies the potential resource available in the three strategic areas proposed for the next rounds (identified in Figure 4.1 and discussed in section 4.3.3), as well as the total resource of sea-bed which is assumed to be suitable (essentially on the basis of depth) for offshore wind farms. The area calculations exclude the region within the 5km coastal zone. This is purely an indicative assumption that large scale development very close to the coast is likely to prove more contentious than proposed development further offshore. For all regions, the potential resource is separated into the area available within territorial waters, and the potential resource beyond the territorial water limit.

Whilst these numbers indicate a vast potential overall, they should be interpreted purely as indicative of the general regions where development is likely, rather than indicating the scale of development actually possible. To date, technology has only been tested in sea depths of 15m, so there will inevitably be an element of speculation as to the scale of development which might ultimately be feasible in sea depths of 30m or 50m. It should also be recognised that no assumptions have been made about the potential conflicts of interest or environmental impact, and how these factors might influence the amount of development which might be successful in gaining development consent.

A further factor that will influence the development of offshore renewables will be the availability of network connections onshore to export the power to centres of demand. No assumptions have been made here of the effect network constraints will have on the scale of development possible (although section 8.5 refers to a study which has estimated the potential capacity which could be accommodated in these three strategic regions without incurring major network reinforcement).

Table 2.2: Potential offshore wind generation resource in proposed strategic regions

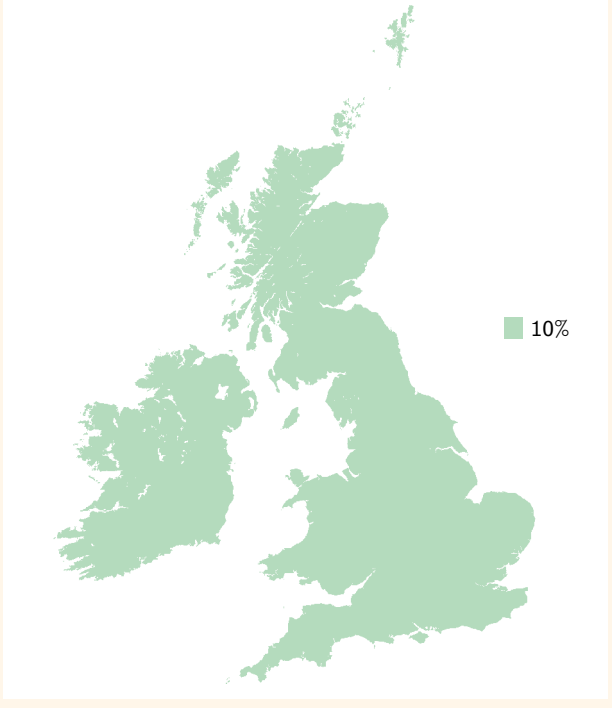
Water depths	**5 to 30 metres**				**30 to 50 metres**			
Region	**Area**	%	**MW**	**TWh/yr**	**Area**	%	**MW**	**TWh/yr**
Within territorial waters	**Sq.km**				**Sq.km**			
North West	2,748	17	32,976	115	634	3	7,608	27
Greater Wash	2,037	12	24,444	85	202	1	2,424	8
Thames Estuary	2,068	12	24,816	87	812	4	9,744	34
Other	9,769	59	117,228	410	18,371	92	220,452	771
Sub-total	16,622	100	199,464	697	20,019	100	240,228	840
Outside territorial waters								
North West	597	6	7,164	25	1,433	5	17,196	60
Greater Wash	5,354	50	64,248	225	744	3	8,928	31
Thames Estuary	31	0	372	1	36	0	432	2
Other	4,662	44	55,944	196	27,070	92	324,840	1,136
Sub-total	10,644	100	127,728	447	29,283	100	351,396	1,229
All waters								
North West	3,345	12	40,140	140	2,067	4	24,804	87
Greater Wash	7,391	27	88,692	310	946	2	11,352	40
Thames Estuary	2,099	8	25,188	88	848	2	10,176	35
Other	14,431	53	173,172	606	45,441	92	545,292	1907
TOTAL	**27,266**	**100**	**327,192**	**1,144**	**49,302**	**100**	**591,624**	**2,069**

Despite these provisos, the numbers presented in Table 2.2 clearly indicate the potential importance of different regions for offshore wind farm development. In particular, the significance of the Greater Wash area, both within and beyond the limit of territorial waters, is apparent. This highlights the need for legislation to enable the full potential to be realised.

The potential generating capacities of the offshore areas have been calculated assuming that 3MW turbines are installed at a separation of 500m. The output has been estimated assuming a load factor of 40%.

The total figures of 919 GW and 3,213 TWh/yr indicate a vast potential compared with the 2010 renewables target of 10% of electricity supplied, equating to 33.6 TWh/yr.[16] Despite the considerable potential for expansion of the offshore wind farm sector, the total area of the seabed which might be devoted to power generation from wind energy would be small compared to the total size of the UK's marine resource, as shown in Figure 2.8.

Figure 2.8: Area required to generate 10% of UK electricity demand



16 DTI (2001), New and Renewable Energy: Prospects for the 21st Century: The Renewables Obligation Statutory Consultation

2.5 Offshore developments in Scotland, Wales and Northern Ireland

SCOTLAND

Under the devolution arrangements, the responsibilities of the Scottish Executive (and the Welsh Assembly Government) extend to adjacent waters as far as the 12 nautical mile limit.

In round one, two adjacent sites at Robin Rigg in the Solway Firth are within Scottish waters and applications for consent are being dealt with by the Scottish Executive.

Scotland has huge natural wind resources which are discussed in the Scottish Executive's recent consultation paper, "Scotland's Renewable Energy Potential - Beyond 2010". Developers are currently considering a number of large wind farm projects in Scotland with aggregate capacity well in excess of 2 GW. All these projects are onshore, or on offshore islands. Less attention is being devoted by developers to offshore projects in Scottish waters, although one major project is being considered on the site of the Beatrice oilfield beyond the territorial limit in the Moray Firth.

An important issue is the need for reinforcement of the grid infrastructure to accommodate a significant increase in renewable energy. This has been examined by the DTI co-ordinated Transmission Issues Working Group and follow-up discussions are taking place between the transmission system operators and Ofgem.

The Scottish Executive has devolved responsibility for the promotion of renewables in Scotland as well as consents under Section 36 of the Electricity Act - see Chapter 7 - and some of the other policy matters discussed in this document. Consequently, appropriate devolution arrangements, taking account

of existing devolved responsibilities, will need to be considered in the context of developing a comprehensive framework of law for developments beyond territorial waters in Scotland.

WALES

There are three projects in Welsh waters under round one, at North Hoyle (off Prestatyn) and Rhyl Flats (off Abergele), both on the North Wales coast, and at Scarweather Sands (off Porthcawl) on the South Wales coast. With a total capacity approaching 300MW they will make a major contribution to the development of the renewable energy sector in Wales and will help to meet the Assembly Government's objective of establishing Wales as a showcase for clean energy developments.

Offshore wind is likely to feature strongly in the Assembly Government's future energy policy for Wales which will be informed by the Economic Development Committee's current energy review. An integrated policy approach is being followed which aims to secure benefits from better relationships between developers, local authorities, community groups and economic development and environment agencies, and to ensure that in future clean energy developments are acceptable to the communities on which they impact.

Blyth offshore wind farm

Wales' extensive coastline offers potential locations for other offshore generation technologies such as tidal stream, wave, and tidal barrage (including the possibility of a major barrage across the River Severn).

The DTI currently acts as the co-ordinating body to facilitate the processing of the consents procedures for offshore wind farms in Welsh waters and is responsible for section 36 consents. The Assembly Government is formally consulted as part of this process. It has specific devolved responsibilities for Planning and Environmental issues under the Town and Country Planning Act 1990, and is also the authorising body in respect of the Food and Environment Protection Act 1985 and the Transport and Works Act 1992. Discussions on the possible wider transfer of energy functions to the Assembly are taking place.

NORTHERN IRELAND

In June 2002 the Crown Estate granted a lease to a consortium to assess the technical and financial feasibility of developing a 28km^{s} seabed site on Tunes Plateau, 5 kilometres off the coast of Northern Ireland. The site has the capability to hold up to 85 turbines producing up to 250MW. In tandem with the feasibility studies, the consortium will work through a detailed environmental impact assessment with a view to applying for statutory consent under Article 39 of the Electricity (Northern Ireland) Order by June 2003. If the project gains consent, it is anticipated that the first phase of turbines will be generating renewable electricity for Northern Ireland by 2005.

Wind will be a key feature of renewable energy policy in Northern Ireland and offshore wind has the potential to play a major role, subject to all the environmental concerns being adequately addressed.

Work is also underway to assess the potential of 11 sites in the waters off Northern Ireland identified as possessing significant tidal stream flows. It is possible that future development of these sites could utilise marine current turbines and wind turbines on the same foundation.

2.6 Progress in other countries

REPUBLIC OF IRELAND

The Republic of Ireland is pushing ahead with the development of offshore wind installations. The Government has set out a policy framework and Airtricity, a wind energy company, is planning the construction of the world's largest offshore wind farm.

The process for developers was set out by the government in July 2000. There are two distinct phases for offshore wind projects:

- Phase 1-investigation of site suitability, including an environmental impact assessment (EIA); and
- Phase 2-construction and operation, requiring a full environmental impact statement (EIS) and full public consultation.

Airtricity's planned wind park will consist of 200 turbines with a nominal output of 520MW, which will eventually provide over 10% of the country's electricity requirements. The park will be built on a sandbank 7km off the coast of Arklow in County Wicklow. Airtricity has completed extensive site investigations and studies, and was granted a Foreshore Lease by the Department of Communications, Marine and Natural Resources in January 2002. Construction is anticipated by 2007, and the project is expected to cost €650m.

In addition to this development, a number of other consortia have been awarded licences to investigate the suitability of sites for wind energy production.

OTHER EU COUNTRIES

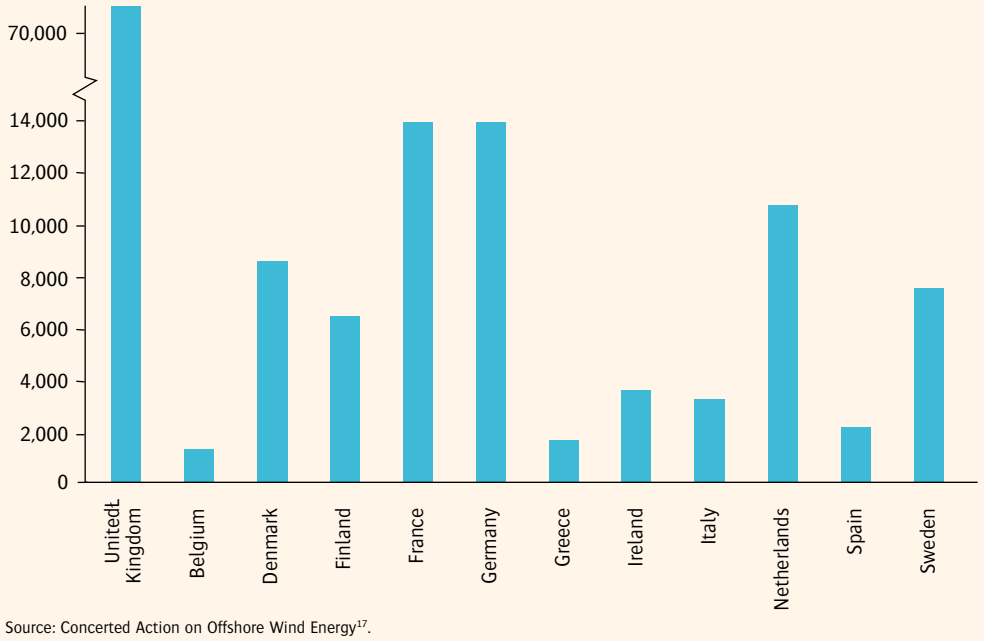
The European Union plans to increase the share of renewable energy to 12% by 2010. Offshore wind could make a significant contribution to achieving this target. This is illustrated by figure 2.9 which shows estimates of the resource in some European Union countries taken from a recent study funded by the European Commission.

The German government has a target to double the share of renewable energy by the year 2010, implying that renewable energy will make up 12.5% of the total energy generation by 2010. The onshore wind sector has developed rapidly, although the Government anticipates that the rate of growth will slow within a few years.

In January 2002, the German government published a strategy on offshore wind. At the time, it had received applications for 29 wind farms in the German Exclusive Economic Zone (EEZ) - comprising 22 applications in the North Sea and 7 in the Baltic Sea- in addition to several planned wind farms in German coastal waters. The strategy discussed an ambitious long-term vision which would see 20 to 25GW of installed offshore wind power in the coastal waters and EEZ, amounting to 15% of energy consumption.

Denmark has led the European field with a 40 MW offshore wind farm already in operation at Middelgrunden, a large scale development recently operational at Horns Rev, and further plans for large scale developments at Roedsand, Oeme and Laeso. Meanwhile, in Belgium, there is one offshore wind farm planned, and another project has been turned down.

Figure 2.9: Offshore wind resource estimates for EU countries (MW)



Source: Concerted Action on Offshore Wind Energy[17].

17 From Concerted Action on Offshore Wind Energy website http://www.offshorewindenergy.org/

A LEGAL FRAMEWORK FOR OFFSHORE RENEWABLES

3

3.1 Introduction

Exploitation of renewable energy is one of several marine activities, such as aggregates extraction, oil and gas exploration and production, and the laying of telecommunications cables, for which a legal framework is necessary to enable development to be regulated. The ownership of the bed of the territorial sea and, with the exception of coal, oil and gas, the UK's rights to explore and exploit the Continental Shelf are vested in the Crown Estate. The Crown Estate grants leases or licences as appropriate to permit developers and operators to make use of these rights. In the case of oil and gas, the power to licence exploration and extraction throughout the UK including its territorial waters and on the Continental Shelf, is vested in the Secretary of State for Trade and Industry.

Development consents and regulatory control of marine activities are matters for the appropriate Government Department. The statutory consents required for offshore renewable energy projects are outlined in Chapter 7. The purpose of statutory consents is to protect affected parties from the adverse effects of development. They also ensure that development decisions are made on the basis of a comprehensive balanced consideration of impacts, both positive and negative, and are used to decide whether or not a development is acceptable, and if it is, to establish the conditions under which the development is permitted.

In the case of offshore renewables, the legal basis under which development rights are allocated is defined clearly only within UK territorial waters. Briefly, the Crown Estate has powers to grant a lease for development of wind, wave or water driven generating stations within UK territorial waters. However, beyond the limits of territorial waters there is currently no comprehensive legal framework for regulating development of the resource, nor for granting developers security over a site. Primary legislation will be necessary to address this shortcoming so that the potential of offshore renewables can be fully realised. The proposed legal basis for developments beyond territorial waters is outlined in section 3.4 below.

3.2 The first round - The Crown Estate lease

The Crown Estate has entered into leasing arrangements for the first round of wind farms for a term of 22 years. These arrangements cover issues such as rent, a requirement that the construction of the wind farm is completed within two years after work starts, a duty to keep the wind farm in operation, and maintenance requirements.

The lease is signed between the Crown Estate and the wind farm developer only after all the necessary statutory consents for the development have been obtained from the relevant Government Departments. To give the developer security over the site while the consents are being obtained, the Crown Estate enters into an Agreement for Lease with the developer.

In preparing for the first round of development, the Crown Estate decided on a method for allocating leases to developers interested in building wind farms, after consultation with the potential developers and the DTI. Developers were invited to pre-qualify and to apply for a site. A cautious approach was adopted and each site was restricted to 30 turbines. The sites allocated were limited in size to a maximum of 10km^2. The criteria used by the Crown Estate in assessing bids were the financial standing of the candidates, their offshore development expertise and their wind turbine expertise in particular. Developers proposed their own sites. Although there was potentially an element of competition in the process, there was no direct competition for individual site leases as no two companies submitted bids for the same site.

Box 3.1 presents some relevant details of the current Crown Estate leasing process. It lists the main elements of the Agreement for Lease and of the subsequent lease. It is not a comprehensive list (omitting, for example, various standard legal safeguards).

Box 3.1: Elements of the Crown Estate standard leases

Agreement for Lease

- Requires a deposit
- Requires guarantors
- Sets out a period for site assessment during which an option may be called on the lease
- Defines position of the site, and ways of subsequently altering it
- Defines need for tenant to obtain relevant consents for development
- Requires data about proposed project output
- Sets out timetable for the issue of a lease

Lease

- Defines term of the lease (22 years)
- Defines tenant's right to use cables, develop the site etc
- Commits tenant to good and responsible construction and working methods (including avoidance of unnecessary damage etc)
- Commits tenant to obtaining necessary consents
- Commits tenant to works timetable
- Commits tenant to specified output capacity and to running that capacity
- Commits tenant to rental payments (£0.88/MWh, indexed by the Retail Price Index)
- Defines conditions for assigning the lease to another party
- Defines the financial standing required of the tenant, guarantors and any assignees by the landlord
- Commits the tenant to obtaining insurance
- States a requirement for decommissioning
- Commits the landlord to protecting the tenant's interest (eg, no dredging in the relevant area; no adjacent wind farm developments which are harmful to the tenant without compensation being paid)
- Does not define conditions for handing on the lease at the end of 22 years

3.3 The second and future rounds

The second and any subsequent rounds under the existing legal framework will be managed by the Crown Estate, in co-operation with DTI. Regulation by Government Departments will continue, as discussed in Chapter 7. Until new legislation is brought into force, it will only be possible to offer development leases for sites within territorial waters. However, developers will be encouraged to investigate sites beyond the boundary of territorial waters in anticipation of future legislation being enacted. In order for developers to gain security over exploration sites beyond territorial waters, the Crown Estate may be able to invite developers to apply for exploration licences, although the range of exploration activities that could be undertaken during this period would be limited.

Chapter 4 examines options for the design of the round and site leasing / licensing procedures - i.e. the 'rounds'. Whilst administration of the rounds under the existing framework will be the responsibility of the Crown Estate, it will be important to ensure that procedures are carefully designed within the context of energy and environmental policy objectives. For example, they will need to ensure compatibility with the requirements for strategic assessment, create a framework that will encourage investment in a developing industry, and create potential opportunities for co-operation between developers. These issues are considered in the next chapter.

3.4 Legislative basis for developments beyond territorial waters

3.4.1 BACKGROUND

New legislation is needed to allow development outside territorial waters, since the existing legislation that already applies beyond territorial waters is insufficient to enable wind farm development to take place beyond the 12-nautical-mile limit. There is no current satisfactory legal basis for giving developers security over a site, nor is there a complete consenting process, and much of the other legislation which regulates and supports wind farms in territorial waters does not extend beyond such waters. Primary legislation will be necessary to build a comprehensive legal framework.

With such a legal framework in place developers will be able to take advantage of considerable wind resources beyond territorial waters and have greater choice about where to locate their project. As more development takes place within territorial limits the scope for large-scale development may be constrained by the lack of available seabed. The cumulative impact of developments in territorial waters may reach levels where no further development would be acceptable. The inclusion of waters beyond the 12-nautical-mile limit within the area available for wind farm development will enable these potential constraints on the expansion of the industry to be removed.

3.4.2 THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA (UNCLOS)

UNCLOS sets out the rights of a coastal State over its territorial sea and also establishes its rights over the seas beyond these limits. Whilst the UK has full sovereignty over its territorial sea, its rights over the waters beyond the 12-nautical-mile boundary are more limited.

3.4.3 THE CONTINENTAL SHELF

A coastal State has sovereign rights for the purpose of exploring and exploiting the natural resources of its continental shelf, and the exclusive right to erect structures or installations for these purposes. Natural resources are defined as the resources of the seabed and subsoil and so, for example, include oil and gas. This provides the legal basis in international law for the UK to prospect for and to extract oil and gas from the continental shelf.

3.4.4 THE EXCLUSIVE ECONOMIC ZONE

Quite separately UNCLOS gives a coastal State such as the UK the right to establish a 200 nautical mile Exclusive Economic Zone (EEZ) around its territory, within which it can exercise sovereign rights in relation to activities such as fisheries, pollution and the production of energy from the water, currents and winds. In addition, the coastal State is given the exclusive right to construct, and to authorise and regulate the construction, operation and use of installations and structures for these purposes. In order to protect these installations and structures, and to ensure safe navigation, a coastal State may establish safety zones around them for a distance of up to 500 metres. In exercising these rights, a coastal State must not interfere with the rights of one States under international law; in particular, the right of freedom of navigation.

The UK has not declared an EEZ. However, it has established an Exclusive Fisheries Zone and a pollution zone in which it exercises EEZ fisheries rights and pollution control rights respectively. It is the Government's intention to make an appropriate declaration asserting the UK's sovereign rights in accordance with UNCLOS in relation to the production of energy from the water, currents and winds in a Renewable Energy Production Zone which will extend up to 200 nautical miles from the baselines of the territorial sea.

Before the UK can exercise EEZ rights conferred by UNCLOS as a body of international law, there has to be legislation at national level which vests such rights with an authority competent to exercise them and defines the limits of the Renewable Energy Production Zone. So far as the first aspect is concerned, it is not clear whether Section 1(1) of the Continental Shelf Act 1964 fulfils this requirement in respect of a Renewable Energy Production Zone.

This states that "any rights exercisable by the UK outside territorial waters with respect to the sea bed and subsoil and their natural resources, except so far as they are exercisable in relation to coal, are hereby vested in Her Majesty." It can be argued that the rights referred to in Section 1(1) include EEZ rights in respect of a Renewable Energy Production Zone because the long title of the 1964 Act is sufficiently broad to cover EEZ rights under UNCLOS. The EEZ and continental shelf largely cover the same maritime area and the reference to the sea bed and subsoil and their natural resources could be construed to cover the placing of a wind farm structure in this area.

Horns Rev wind farm, Denmark

Equally it can be argued that Section 1(1) cannot refer to rights in respect of a Renewable Energy Production Zone. The title, long title and subheading to section 1 of the Continental Shelf Act suggest that the Act refers only to continental shelf rights, not EEZ rights. Furthermore, the Continental Shelf Act, which was enacted in 1964, cannot cover EEZ rights, because the concept of an EEZ did not exist in international law at that time.

Given this uncertainty the Government is firmly of the view that it is unsatisfactory to rely on the Continental Shelf Act as a legislative basis for granting development rights for projects beyond territorial waters. It is the intention of the Government therefore to legislate to vest clearly the UK's EEZ rights in respect of a Renewable Energy Production Zone with the Crown Estate or other appropriate body. In this way the wind energy industry will have the assurance that their right to develop projects, both in territorial waters and within the Renewable Energy Production Zone, is based on a firm legal footing. A decision on the most appropriate body in which these powers should be vested, and how best to ensure that policy objectives are met in the granting of development rights, will be made during the preparation of the legislation. The respective roles of the Crown Estate, DTI and other government departments will be clarified during this process.

ISSUE 1. *Comments are invited on the urgency with which new legislation is needed to allow developments outside territorial waters.*

ALLOCATION OF RIGHTS: THE SECOND AND FUTURE ROUNDS

4

ALLOCATION OF RIGHTS: THE SECOND AND FUTURE ROUNDS

4.1 Introduction

In the first round, the Crown Estate assessed bids on the basis of the financial standing of the candidates; their offshore development expertise; and their wind-turbine expertise. In the circumstances, these factors were sufficient to allocate one site per developer. However, as interest and expertise in marine renewables continues to develop, it will become increasingly likely that the most desirable sites are the subject of competition between developers.

Moreover, some developers may want to reserve favourable sites for future exploitation, which could inhibit optimal development. At this early stage in the development of the industry, the extent of such potential problems that might lead to inefficient development of the resource are unclear. It is therefore important to consider carefully the design of the competition process and allocation of sites, so as to ensure the best chance of encouraging a pattern of development which allows optimal exploitation of the available resource in an environmentally responsible manner. Strategic environmental assessment, as described below and in chapter 6 will be incorporated into the design of the allocation process to help achieve this objective.

As outlined above, until new legislation is brought into force, it will only be possible to conduct rounds for development leases for sites within territorial waters. However, developers will be encouraged to explore sites beyond the boundary of territorial waters in anticipation of new legislation being enacted. In order to motivate developers to carry out such exploratory site assessment effectively and to the highest standard, it will be necessary to provide developers who make this investment with an exclusive option on the future development of that site, subject to achieving the necessary regulatory consents. Discussions with the industry will agree a way forwardd over the coming months.

In the sections below, options are considered for the site allocation process, drawing on experience from other sectors. The Crown Estate will administer the next round under the existing legal framework, but given the important role offshore renewable investment is expected to play in meeting energy policy objectives, energy policy considerations will play a fundamental part in the design of the next and future leasing or licensing rounds and in the process of site allocation. The paper makes recommendations for the arrangements for future offshore wind farm rounds, and invites views.

4.2 The design of the competition process

Strategic environmental assessment will inform the overall nature of the next and future rounds. Strategic assessment of areas proposed for future rounds will be conducted before the announcement of the round, so that conclusions can properly be used to inform the scale and location of development that would be acceptable within each region. The first phase of SEA, focussing on the three strategic regions described in section 4.3.3. is underway. It is anticipated that the SEA report will be issued early in 2003, and will be available to developers to help frame their proposals for possible wind farm development within these regions.

Past administrative practice in other areas, such as aggregates and oil and gas, suggests that the usual way to address competing interests for a profitable site would be to instigate a tender process that focused on the credibility of competing development plans. In this case, the criteria against which tenders would be judged would include:

- the underlying development plan, including planned timetable;
- experience in constructing offshore marine generation;

- experience in electricity generation;
- approach to obtaining the relevant consents;
- financial viability;
- underlying financial guarantees;
- relationship of planned area of investigation to planned output;
- environmental record; and
- willingness to co-operate with adjacent developers.

If the tender assessment were to give too much emphasis to the size of the development offered in the bid, then bidders might tend to include less economic areas in order to increase the proposed size of the development, purely to win the competition.

Another option would be to allocate licences or leases by price or market mechanisms such as an auction, a method which has also been used in other sectors. An auction could be based on a single lump-sum payment for the licence, or developers could bid the level of annual rental that they would be willing to pay. A well constructed auction would allocate sites efficiently, but in practice, auctions can suffer from various distortions. It is unlikely that an auction or financial tender would be appropriate during the period when the industry is developing, largely because of the considerable economic and financial uncertainties which will continue for some time.

On balance, the most appropriate option would seem to be a tender process that focuses, within the context of the SEA, on the credibility of competing development plans, the scale of development proposed, and the mitigation of wider impacts. It is proposed that this basis of site allocation will be pursued at least until such a time as the industry becomes firmly established.

ISSUE 2. *Views are invited on how best the allocation process can be tailored to optimise the development potential within the context of strategic environmental assessment.*

4.3 The terms of the competition

4.3.1 SPECIFYING THE NATURE OF THE BIDS

Whilst the overall SEA is developed, a means must be found of allowing developers to commit funds to research and site assessment in an orderly manner and with some assurance that if development consents are eventually granted they will have the development rights on clear and certain terms. There are two key issues to be considered:

- should the size and shape of each block be specified and
- should the upper and/or lower limits of generating capacity be specified?

One option (based on oil and gas experience) would be to define a set of 'blocks' to put on offer, based on known features of the seabed, and analysis of the best wind resources. The use of blocks to divide the area available for licensing is common practice in minerals and hydrocarbons licensing. Provided the area of individual blocks is appropriate, this division

Blyth offshore wind farm

facilitates the competition for, and administration and exchange of licences by providing a simple reference framework.

However, whilst this approach works well in the oil and gas sector, it is not clear at this early stage in the development of the offshore wind industry whether the block approach would apply equally well. One problem would be identifying the appropriate number and size of blocks, and, for example, ensuring that they did not result in artificially limiting the development possible in a particular region. Specification of the size and shape of the lease areas might result in competing bids for the same block, but would avoid any possibility of overlapping bids. The more open the site application process is, in terms of shape and size of blocks, the more likely it is that there will be overlapping or conflicting bids, with the need for such conflicts to be resolved.

An alternative approach would be a flexible, pragmatic one, permitting developers to specify exactly what they wanted, both in terms of the size of the site and the scale of generation capacity. In the process of considering applications, it would be possible for bids to be modified when necessary (including reducing the scale of any bid for exploration rights which seemed inappropriately large in relation to planned electricity output).

ISSUE 3. *Views are invited in whether developers should have freedom to propose the exact size and shape of block they wanted, subject to criteria applied in the selection process, or whether developers should be invited to bid for one or more blocks. Comments are also invited on the appropriate block size if the latter option is adopted.*

4.3.2 FIXED OR ROLLING LEASING ROUNDS

It is accepted that SEA within strategic regions should preceed the announcement of future rounds for offering site leases for offshore wind farm development. Chapter 6 outlines the approach to SEA which is being taken in preparation for future announcements. Following the SEA, the options to consider are whether leases should be offered on demand, or whether applications should only be considered within fixed competitions. If there are to be fixed rounds, should these (and therefore the SEA) cover all potential UK waters, or should development be focused within particular areas?

If individual applications and developments had no wider impact-on the industry as a whole, on energy policy concerns, or on environmental and social concerns-then there would be little case for a fixed round. However, in practice developments are likely to have wider impacts, and cumulative effects may arise within regions. In such circumstances it would seem better to consider applications within the context of rounds.

Given the geographic distribution of suitable sites for wind farms as shown in Figure 2.7, it seems most probable that development will become clustered geographically within strategic regions where there are large areas of relatively shallow seabed. It is therefore sensible to offer site leasing options in geographically defined areas where development interest is most likely, rather than in an unrestricted manner, and in fixed rounds rather than on a continual rolling basis. In this way the potential cumulative impacts, as well as site specific impacts could be considered in reaching decisions on each application. This would encourage the industry to develop in a controlled way within regions, which will provide a good basis for assessing and monitoring potential impacts.

In practice, there are a number of reasons why a round focussing on strategic regions will be of benefit, both to developers as well as those responsible for the site allocation process. It will also benefit the public consultation phase of applications for development consent as consultees will be able

Table 4.1: Boundaries of potential strategic areas

Name	Latitude	Longitude	Potential resource area, km²
North West	53 20N - 54 50N	03 00W - 04 00W	5,412
Greater Wash	52 50N - 53 50N	00 24E - 02 00E	8,337
Thames Estuary	51 20N - 52 00N	00 48E - 02 00E	2,947

to consider all the relevant development proposals together rather than considering applications on an ad hoc basis. Advantages to developers and regulators of being able to assess all proposals in relation to one another would include:

- the possibility of developers sharing survey work;
- the possibility of developers sharing the cable route to land;
- the ability to consider demand for onshore connections and reinforcement in aggregate rather than on an ad hoc basis;
- Government departments considering consent applications will find it easier to review the effect of a range of impacts together; and
- general strategic guidance may be provided as to the best means of mitigating any adverse environmental and other effects.

It is therefore proposed that applications for leases should be invited in fixed rounds within defined strategic regions. Strategic environmental assessment will be carried out before an announcement of any future round is made, and development outside strategic areas, other than extensions to already-consented sites, would be permitted only in exceptional circumstances where a SEA had not been undertaken.

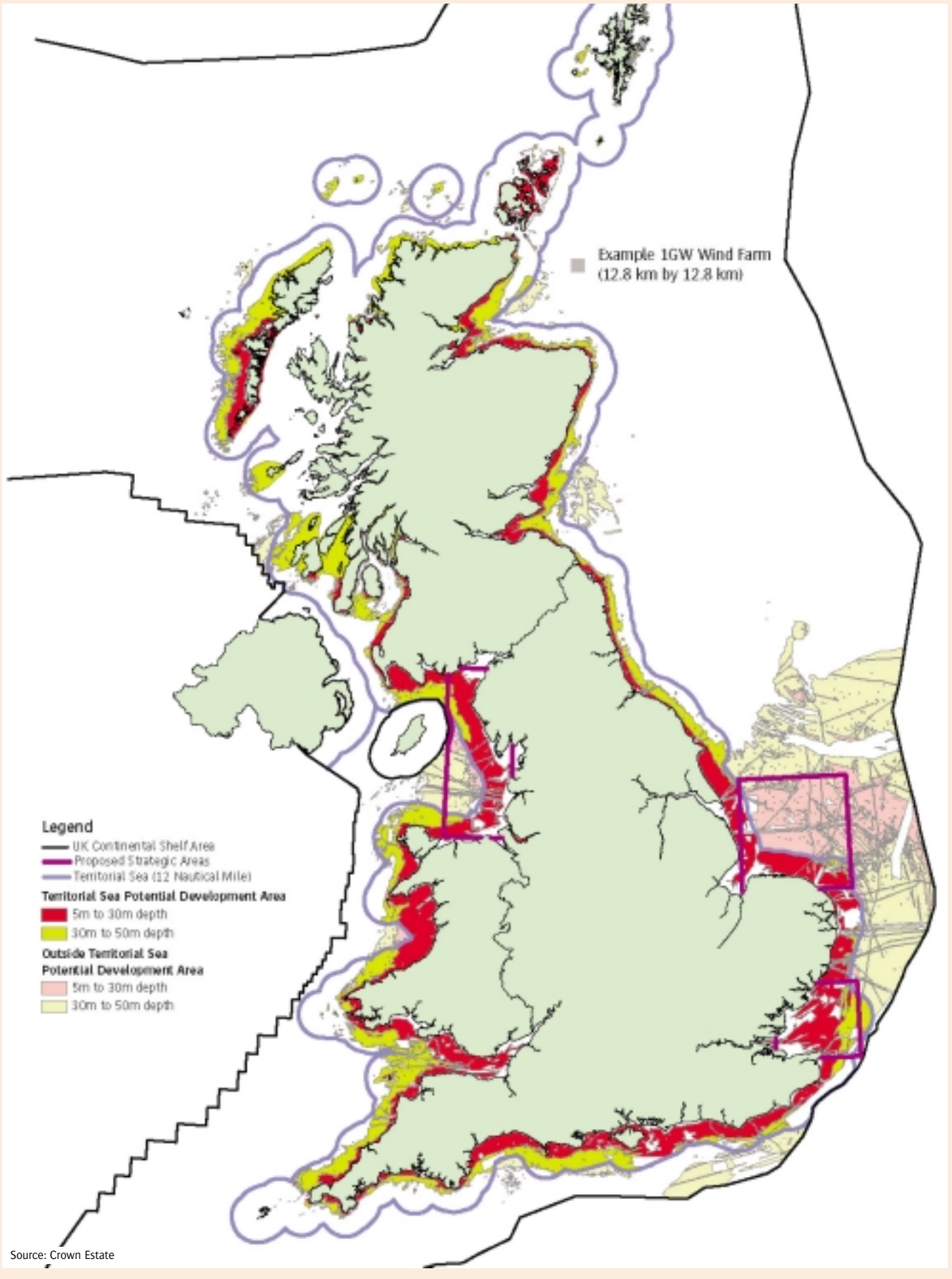
ISSUE 4. *Comments are invited on the proposal to offer leases in fixed, geographically defined regions, following strategic environmental assessment.*

4.3.3 PROPOSAL FOR NEXT ROUND

The strategic regions proposed for the next round are shown in Figure 4.1 with indicative provisional boundaries published here for consultation in Table 4.1. A strategic environmental assessment of these areas, both within and beyond the boundary of territorial waters, has been commenced. An environmental report will be issued for consultation before an announcement on the precise nature of the round is made. The strategic environmental assessment process is described fully in chapter 6, but briefly, it will be used to advise the appropriate pattern and scale of development in the strategic regions.

The strategic regions were selected on the basis of analysis of the Windbase database, and provisional indications of interest from industry (submitted to DTI by BWEA). Windbase demonstrated that there was a close correlation between the location of sites where the industry had expressed an interest in future development, and the regional distribution of potentially suitable sites on the basis of bathymetry etc. It appears that development interest is likely to be clustered in three general regions; the Thames Estuary, the Greater Wash and the North West. In the Thames Estuary and Wash areas there is known to be substantial grid capacity available. The boundaries of these regions are indicative, and not rigidly defined. Therefore, provided that the SEA had adequately considered the area, it would be possible to consider development applications slightly beyond the boundaries set out in this document.

Figure 4.1: Map of proposed strategic resource areas



Source: Crown Estate

Extension of the SEA into further areas will be decided on the basis of the scale and geographic location of interest expressed by developers.

ISSUE 5. *Comments are invited on the proposal to limit development to three strategic areas in the fashion described, and on the proposed boundaries of the strategic areas. (Developers who wish to pursue sites outside the boundaries should inform the DTI in their responses to this consultation).*

4.3.4 THE FREQUENCY OF ROUNDS FOR STRATEGIC AREAS

How often should each area be subject to a round?

The time between rounds should be related to the cycle of offshore development and investment. A period of three years is proposed as an appropriate interval between rounds in strategic areas: this would allow for a cycle of exploration and subsequent development. There could, of course, be rounds covering other areas in the interim, and consideration could be given to the possibility of some intra-round activity in the main strategic sites, but exceptions would be rare. If such rounds are adopted, one option would be to stagger the rounds between strategic areas, so that there is a round every year, rotating around the three strategic areas in a three-yearly cycle. However, so far as next steps are concerned, it is proposed that all three strategic regions should be covered in the next round, subject to the results of the SEA.

ISSUE 6. *Views are invited on the frequency of rounds, and the proposal to invite bids for all the strategic areas in the next round.*

4.4 Financial contributions

4.4.1 INTRODUCTION

As with round one there will be a requirement for developers, under the terms of the lease, to pay a financial consideration for the use of the seabed to the Crown Estate as landowner. This payment will take the form of an annual rent reflecting the value of the site itself. Other costs may also arise from registration of interest or prequalification procedure legal costs, and the provision of guarantees in respect of the eventual decommissioning of the installations. In round one deposit arrangements provided a means of ensuring that developers met the timescale and milestones in the Agreement for Lease.

4.4.2 DECOMMISSIONING OBLIGATIONS

The Crown Estate lease requires developers to submit decommissioning plans and to comply with the decommissioning obligations prior to the expiration or determination of the lease. Decommissioning requirements will however mainly be laid down in development consents given by the regulating Government Departments. In both cases there needs to be financial surety that developers will be able to meet these absolute obligations, possibly at some considerable time in the future.

Under round one leaseholders were required to provide guarantors in the event of failure and for the purposes of decommissioning. The financial or net asset test was based upon estimated decommissioning costs of an individual 30 turbine site with each development having a Guarantor. Given the risks associated with Guarantors and the likelihood that companies will acquire more than one development in future, the net asset test is not a suitable mechanism. For subsequent rounds, in order to remove as much risk as possible, the Crown Estate and Government believe that bonds or substantial financial deposits will be necessary.

ISSUE 7. *Views are welcome on how the financial requirements for decommissioning can best be met in the interests of both the industry and the environment.*

4.4.3 RENT BASIS

The Crown Estate's rent must be the best consideration reasonably obtainable, in accordance with the Crown Estate Act 1961.

In round one 20 developers have entered into agreements including a rent provision based on 2% of gross revenue. As shown in Figure 2.3, this 2% rental is a small fraction of the costs of an offshore project, and has proved not to be a major consideration for the industry.

The Crown Estate has reviewed the evidence available and has concluded that the rent basis for all new leases to be granted until 2010 will continue to be at the rate of 2% of gross revenue, with a full rent review to market level after 20 years (and thereafter at 5 yearly intervals).

This will give certainty to the industry about rent to be charged, but the Crown Estate will continue to monitor and review the effect of the rental payments on this emerging industry. Should economic evidence emerge indicating that the viability of future developments is, against expectation, being impeded by it, the Crown Estate has advised that it will review whether revision of the rent would be justified.

4.4.4 FEES TO RECOVER ADMINISTRATIVE COSTS

It is common practice for applicants for licences and consents to be charged a fee to cover administrative costs. DTI and other authorities will, as a general policy, have a requirement to collect fees to cover administrative costs. Fees will therefore be charged to cover the administrative costs of granting licences and consents for offshore activity. The precise way in which costs are recovered, whether through a single fee or annual payment, is open for consideration.

4.5 Rights and responsibilities

Consideration needs to be given to the granting of exploration rights to investigate a site and subsequently the rights to develop that site. Inevitably, given the uncertainties, developers cannot determine exactly where in an area of investigation they will most want to make their final investment before site investigations are completed. The existing Crown Estate Agreement for Lease provides developers with an exclusive area whilst allowing them some flexibility during the early investigation phase. Within strictly defined spatial and temporal limits, they are able to redraw the area they wish to develop on the basis of their early consultations, investigations and site assessments.

Developers will need to be given assurances on the exclusivity rights and size of area they will be able to investigate and subsequently develop. The scale of development and informed location selection must conform with the guiding principles of the SEA, which will evaluate the environmental effects of the programme, including cumulative impacts, whilst allowing reasonable flexibility as the project investigation proceeds.

The Government accepts that wind farm developers will wish to be granted exclusive development rights in areas where they have financed the initial process of investigation. However, developers might request rights of investigation over a larger area than they plan to develop subsequently, simply to give themselves a wider range of options, thus limiting the area available for future investigation, and perhaps giving false messages about the scale of the proposed development. In round one, individual site development was limited to 10km^2. and a maximum

of 30 turbines (except for the single Northern Ireland site). The site initially allocated under the Agreement for Lease was geared to the size of the developer's proposed development. Clearly, sites in future rounds need to allow for much larger scale development if the offshore area is to make the optimum contribution to renewables targets.

A company committing funds to exploration work takes risks and expects a fair return on this expenditure, but it should not necessarily have an exclusive right to use that resource in perpetuity. Moreover, even if a company that is granted the right to investigate a particular area is considered to have a prior claim to exploit any usable resource, a company that fails to explore an area properly, or to turn good prospects into subsequent development proposals, should lose its rights.

The Agreement for Lease should contain a mechanism under which, if the agreed programme of work is not met, the exclusive area can be reduced to reflect the extent to which the programme has not been achieved, or in the final analysis, the option should be able to be withdrawn.

Once development consents have been granted the Agreement for Lease will allow the development lease to be granted to the developer. Again, there will need to be provisions under which the developer is committed to fulfilling the programme for the project, although this might be in several phases.

All of the above refers to the situation in the territorial sea where the existing legal position is clear. The SEA process will however also cover the continental shelf in strategic areas. If the most viable and environmentally acceptable sites are to be chosen, both the territorial sea and Renewable Energy Production Zone (i.e. beyond the boundary of territorial waters) need to be considered in tandem. Although, as section 3.4 explains, legislation will be required to secure a firm basis for development in the Renewable Energy Production Zone, consideration must be given to safeguarding suitable areas and to allow exploration and appraisal of sites to begin without delay.

Under the Continental Shelf Act the UK's international rights to the seabed and subsoil and their natural resources are vested in the Crown Estate. It is intended to pursue means by which exploration licences, perhaps exclusive in nature, can be granted under a similar competition process and at the same time as those for the territorial sea. Such exploration licences might, when the envisaged legislation has been enacted, be exchanged for equivalents to the Agreement for Lease under the new regime.

The Government's proposal, following discussion with the Crown Estate, is that

(a) Under an Agreement for Lease, companies should retain the sole right to develop in an area that they have investigated for a period of three years after the completion of the agreement under which such investigation was carried out, and

(b) The leasing regime should include a mechanism whereby leases are surrendered if companies do not carry out their development plans. This could be done by renewing the lease after a fixed period, conditional on the progress that the company has made. A lease would therefore need to specify a timetable for exploration and for subsequent development, with break points in the absence of action.

ISSUE 8. *Comments are invited on the proposal that companies should retain the sole right to develop in an area which they have investigated for a period of three years after the completion of the lease under which such investigation was carried out.*

ISSUE 9. *Comments are invited on the proposal that the Agreement for Lease should specify a timetable for site investigation and the development lease a timetable for subsequent development, with break points in the absence of sufficient action.*

ISSUE 10. *Views are invited on the rules which would give the right amount of flexibility in the specification of the area for development in relation to the area which has been under investigation.*

4.6 Access to information

There is a public interest in ensuring that the geological, meteorological and environmental information obtained during the period of investigation is properly preserved so that it can, if appropriate, be made available to others at a later date. The Government believes that, given its overall responsibilities for constructing a policy framework for offshore renewables, companies should be required to share their information with it. Companies will be given the assurance that the information will not be made available to third parties during the period in which the company itself has secure rights to development.

The Government's proposal is, therefore, as follows.

- Copies of all survey information obtained as a result of investigations should be lodged with the Crown Estate within one year of their completion, as a condition of the lease. The Crown Estate will make the information available to the DTI.
- Companies should retain the exclusive right to the use of this information for three years after the expiry of the agreement under which the information was obtained.
- After three years, if no development has taken place within the area designated for investigation, the DTI should be able to release these data to other companies.
- In any case, and at any time, companies should be encouraged to make information available to third parties on a commercial basis. Throughout the process, the Crown Estate should encourage companies investigating adjacent areas to co-operate and share survey information.

ISSUE 11. *Comments are invited on the proposals for information sharing and publication.*

4.7 Offshore technologies other than wind

This consultation focuses in particular on offshore wind, but the Government wishes equally to provide an appropriate planning framework for other offshore technologies, and ensure that the development of such a framework is properly integrated into the strategic environmental assessment process.

Longer term, it is possible to envisage separate rounds for other technologies, such as tidal stream and wave power, when they reach the point that they can be deployed on a commercial scale. In the meantime, it is anticipated that developers will come forward with requests for sites for demonstration or other one-off projects. Such requests will need to be considered on their merits. One possible mechanism to aid this process would be for the Crown Estate to carry out a financial pre-qualification of developers to allow developments up to a certain size. Discussions between Crown Estate and developers are continuing on these issues.

ISSUE 12. *Views are invited on whether separate provision will be needed for other offshore technologies, and if so on what timescale.*

POTENTIAL IMPACTS OF OFFSHORE DEVELOPMENT

5

POTENTIAL IMPACTS OF OFFSHORE DEVELOPMENT

5.1 Introduction

The Government's vision for the marine environment which was set out in its strategy earlier this year,[18] is to make the oceans and seas clean, healthy, safe, productive and biologically diverse. This will be achieved by means such as protecting important habitats, including the designation of Special Areas of Conservation and Special Protection Areas beyond the 12-nautical-mile limit, exploring the role of spatial planning in the marine environment, developing ecological quality objectives, examining the case for marine-protected areas on the high seas, and reviewing the arrangements for marine scientific research.

Ministers made a number of commitments in March 2002 at the International Conference on the Protection of the North Sea, which formed the 'Bergen Declaration'[19]. They agreed to encourage authorities to develop guidance on areas suitable for development, and invited OSPAR to develop a comprehensive set of criteria to assist them. They also agreed that there was an opportunity to apply the precautionary principle, to exchange environmental impact and monitoring data, and to strengthen international cooperation in spatial planning.

This section first reviews the types of impacts that may arise from offshore renewables. These will include impacts on the environment, fishing, landscape (visual amenity), navigation, civil aviation and defence and local communities.

Of these impacts, some will generate significant conflicts of interest that will prohibit renewables developments in some areas. These include corridors around shipping lanes, oil and gas pipelines, electricity and telecommunications cables, wrecks, aggregate extraction areas, and oil and gas production sites. Figure 5.1 shows a graphical summary of these absolute constraints to development.

18 DEFRA (2002), 'Safeguarding our seas - A Strategy for the Conservation and Sustainable Development of Our Marine Environment'.

19 The Bergen Declaration was signed by Belgium, Denmark, France, Germany, The Netherlands, Norway, Sweden, Switzerland, the UK and the European Commission.

5.2 Environment

The main effects on the environment will be physical impacts on ecosystems and visual amenity, possible interference with sedimentary processes, and global benefits from displaced greenhouse gas emissions. Whereas the latter are well characterised, many of the former effects are uncertain, especially the impacts on bird populations, of vibration on the navigation of cetaceans, and of electromagnetic fields on fish. Given this level of uncertainty, a coordinated approach to research is appropriate, beginning with an overarching strategy for data collection. Since the collection of monitoring data can be made a condition of development consents, there is an opportunity to ensure that data contribute to an overall scheme designed to explore uncertainties and quantify environmental risks, especially those with major, irreversible, or cumulative, consequences.

For all marine renewables developments, a risk assessment is carried out, incorporated within the Environmental Impact Assessment (EIA). The SEA process currently underway (described in Chapter 6) will identify and assess environmental impacts at a strategic level, such as the predicted cumulative impact of different development scenarios. This process will provide a basis for risk assessment and will inform developers as well as those involved in the decision making process on individual applications. The environmental screening study described below will be used as a component of the SEA.

Figure 5.2 shows designated sites of nature interest adjacent to the coast. There is a programme of work under way to identify similar sites at sea. These sites may exhibit special sensitivity to renewable developments on or near the site.

Figure 5.1: Development constraints arising from conflicts in use of the sea

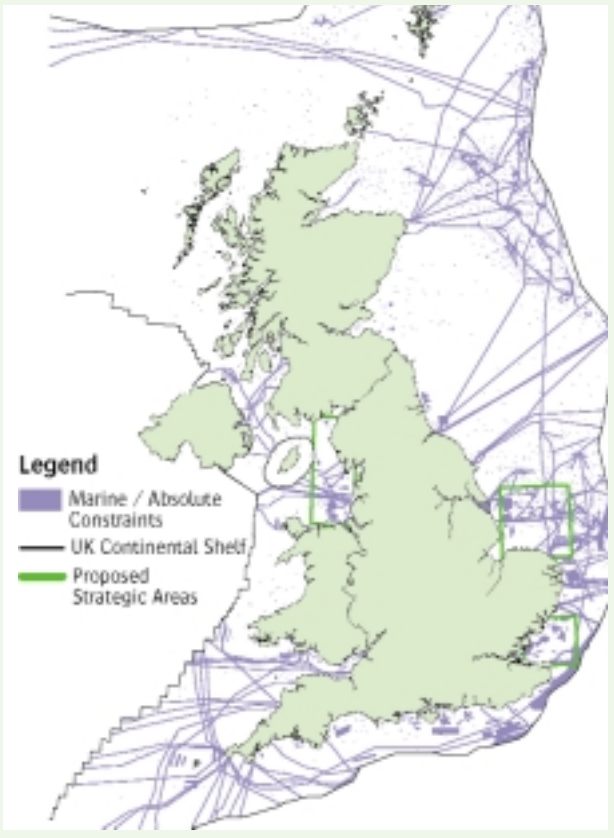
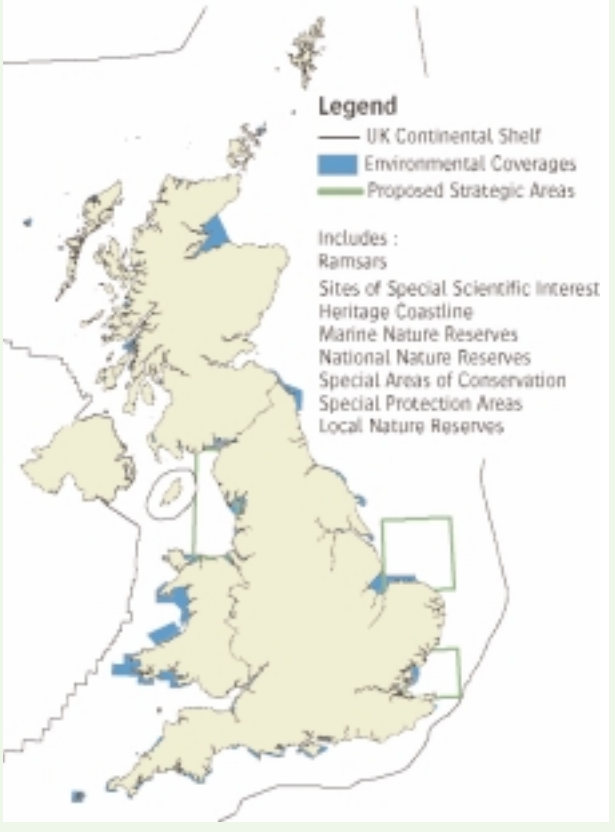


Figure 5.2: Designated sites of nature interest



Decisions on consents are made by Ministers based on assessment of advice from statutory consultees as well as the wider public consultation process. While it is possible to examine each case on its own merits, benchmarks or ceilings of acceptable risk could be useful in the future to screen out certain project that would not be consented because of an unacceptable level of adverse impact. This could be the function of the guidance and criteria mentioned in the Bergen Declaration. Such guidance could be used by developers to inform their site selection, and would provide reassurance that each new site would not set a precedent, but, rather, a view would be taken on which risks were acceptable and which were not. This could help engender confidence in the effectiveness of the environmental consenting process.

ISSUE 13. *Views are invited on the value to developers and other stakeholders of the publication of guidance on acceptable levels of risk from offshore wind farms.*

COWRIE

As part of the pre-qualification procedures for Round One the Crown Estate established a Trust Fund for the purpose of generic environmental studies to assist the early stages of the development of the offshore wind industry. The fund is based upon the interest accruing on the financial deposits made by the developers and therefore is limited in amount as all deposit refunds will be made by the end of January 2005. The fund is administered by a Steering Group known as (COWRIE) Collaborative Offshore Wind Research into the Environment and its role is to identify and commission short to medium-term environmental studies of a generic nature to benefit the UK offshore wind industry as a whole.

Members of COWRIE are drawn from the offshore wind industry and BWEA, DTI, English Nature, Countryside Council for Wales, Centre for Environment Fisheries and Aquaculture Science (CEFAS), the Royal Society for the Protection of Birds and the group is chained by the Crown Estate. COWRIE has conducted a review of studies both in UK and other European countries, notably Denmark, and has identified four priority areas for research:

- potential effects of noise and vibration on marine mammals;
- potential effects of electromagnetic fields on fish;
- bird study methodologies - field testing new remote study techniques (radar and infrared) and baseline methodology for aerial and boat-based surveys;
- displacement of birds from benthic feeding areas.

Project specifications for these studies have been drawn up and several have been put out to tender. Work has already commenced on the electromagnetic field project and it is anticipated that work will commence on the bird rellatted studies during the winter of 2002, subject to contracts being awarded. The COWRIE research studies are quite separate from any requirements on developers to undertake site investigations to inform the Environmental Impact Assessment (EIA) or undertake monitoring pursuant to licence conditions. As the purpose of the research programme is to inform future offshore wind development, the outcomes of the research will provide practical guidance and best practice to developers. As studies are undertaken, they will be reported on the BWEA/ Crown Estate web site at www.offshorewindfarms.co.uk.

ENVIRONMENTAL SCREENING STUDY

The DTI recently commissioned the Marine Biological Association (MBA) to undertake an environmental screening study of the strategic areas identified as the focus of the next rounds. The full report will shortly be available on the DTI website, but in the meanwhile, please e-mail Mike Brook at Mike.Brook@dti.gsi.gov.uk for a copy of the report.

The report provides an awareness of the environmental issues related to marine habitats and species for developers and regulators of offshore wind farms. The marine habitats and species considered are those associated with the seabed, seabirds and sea mammals The report provides a detailed assessment of the likely sensitivity of seabed species and habitats in the proposed development areas. It suggests that although sensitive to some of the factors created by wind farm developments they mainly have a high recovery potential.

The report indicates criteria that have been developed to assess the likely marine natural heritage importance of a location or of the habitats and species that occur there, and that can be applied to survey information to assess whether or not there is anything of particular marine natural heritage importance in a development area. A decision tree is included that can be used to apply duty of care principles to any proposed development.

The report also explores potential gains for the local environment. It suggests that wind farms will enhance the biodiversity of areas, they could act as refugia for fish, and could be developed in a way that encourages enhancement of fish stocks including shellfish.

5.3 Fishing

The fishing industry gives employment to 14,600 fishermen on a regular or part-time basis. In 2001, 738,000 tonnes of sea fish were landed by the fleet (in the UK and abroad) with a total value of £574m.

The view of the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), a principal source of advice to Government on marine environmental issues, is that wind farming will not adversely affect fish stocks as a whole. However, individual developments may have an impact on fish and shellfish at particular locations and the scale of impact would have to be assessed as part of the Environmental Impact Assessment.

Marine renewables may have an impact on fishing activity even if they do not directly affect fish stocks. Firstly, excluding fishing activities from generation areas might either reduce the catch for the fishing fleet operating there, or make it harder for them to achieve the same catch.[20] The fishing fleets' profitability may be reduced as a result. Secondly, the presence of structures may constitute a navigation obstacle, and may reduce the safety of navigation in the vicinity. Although measures may be required to reduce the risk, such as marking with lights and buoys, fishing craft may prefer to avoid navigation within such a zone. Again, this may increase the costs, or reduce the revenues, of the fishing industry. Different types of fishing activity are likely to be affected to different extents.

The DTI has established a liaison group to encourage open dialogue between the fishing industry and the wind energy sector, and to foster closer relations between them. The inaugural meeting was held in July 2002. The group will, as its first project to produce best-practice guidelines on consultation between developers and fishing interests during the various stages of the development of projects, including during the initial scoping phase.

Support vessel at Horns Rev wind farm, Denmark

The consenting process is the basis for determining whether offshore generation should be permitted to disrupt fishing in an area and whether measures should be taken to mitigate it. As the process stands at present, fishing objections may be raised against a marine generation proposal, and, unless an Order is issued under the Transport and Works Act 1992, potentially rights of navigation may persist alongside rights to construct and operate power generating stations.

Where there is a sustained objection by fishermen to a particular wind-farm development, the Government will consider in the balance of the wind energy interests, on the one hand, and the fishing industry's interests, on the other, in deciding whether to grant consent to the project.

20 The creation of excluded areas might increase the catch.

5.4 Visual impact

The visual impact of offshore wind turbines will depend on their distance offshore, the weather conditions as and the height above sea level of the viewpoint. The Guide to Best Practice in Seascape Assessment[21] provides a methodology for assessing impact, and suggests that a distance of 15km may be the maximum limit of visual significance along the coast. Below are shown a series of computer-generated montages of how a wind farm would appear to a person standing on a beach, from distances of around 5km and 10km.

Assessment of the visual impact of development scenarios will form part of the SEA process. In addition, the visual impact of individual development proposals is assessed through the consenting process and opinions on visual acceptability are specifically sought.

5.5 Navigation

Depending on their location, large wind farms in the sea could conflict with rights of navigation enjoyed by marine users. Early wind farms are likely to be located in shallow waters and are therefore unlikely to have an impact on large commercial vessels, although smaller vessels including fishing boats and recreational craft may be affected. Later wind farms and other renewables may have an impact on a full range of vessels as the technological expertise of the industry develops making construction in deeper water possible.

Rights of navigation derive from both national and international law. There is a common law right of navigation over all navigable tidal waters. In public international law, foreign ships have the right of innocent passage through the UK's territorial waters.

North Hoyle Offshore Wind Farm, Point of Ayr. View towards the north west, distance to nearest turbine - 9.5km (photomontage)

Scroby Sands Offshore Wind Farm, South Beach, Great Yarmouth. View towards the east, distance to nearest turbine - 5.1km (photomontage)

21 Guide to Best Practice in Seascape Assessment, The Marine Institute, 2001

Beyond the 12-nautical-mile limit of UK territorial seas, shipping enjoys freedom of navigation. At the same time, under international law the UK is able to construct wind farms and other installations or structures to produce energy from tidal and wave power in a 200-mile Renewable Energy Production Zone, although as explained in Section 3.4.2 this right has not yet been claimed. It is also possible to establish safety zones, up to a distance of 500 metres, around such installations or structures to protect them and passing shipping from collision and damage. The installation of structures, and the safety zones around them, would not be permissible where they would interfere with the use of recognised sea lanes.

The potential impact of proposals for wind farms and other renewable energy structures on navigation is assessed on a case-by-case basis by the Department for Transport or DTI as appropriate as part of the formal process of obtaining consent for the development. These Departments consult those likely to be affected by the development before deciding whether to grant consent. If consent is given, the relevant Department will stipulate how the installation should be lit and marked.

Economic losses resulting from the diversion of navigation may arise when alternative navigational routes are unavailable, or costs are incurred due to diversion. Those adversely affected would be the owners or operators of ships and ports, their associated service businesses, and navigation agencies. The consenting process will need to assess the effects on these parties.

5.6 Civil aviation and defence

Wind turbines could have an impact on civil and military air operations and defence interests more generally, and wind farms must be located so that these interests are not jeopardised. Wind farms located offshore are unlikely to interfere with military low-flying training, which is an important factor when deciding where to site developments on land. However, the effect of wind farms on other aspects of civil and military operations will need to be considered. These include the impact of rotating turbine blades on civil and military radar, the need to avoid flight paths near airports where aircraft and helicopters are flying at low altitudes, and avoidance of military bombing ranges.

As part of a strategic assessment of the three areas proposed for the next round (as described in section 4.3), a high-level screening exercise is being carried out to identify particular zone conflicts with civil and military uses. Advice will then be prepared for developers before bids are invited. This high level screening will not obviate the need for developers to ensure that the MoD has no objection to the siting of a wind farm in a particular location within the strategic area, so developers should inform MoD Defence Estates[21] of their plans at an early stage.

The DTI is tackling some of the generic issues surrounding the impact of wind energy on civil and military aviation. It chairs the Wind Energy, Defence and Civil Aviation Interests Working Group-a forum for a number of stakeholders with an interest in the interaction between wind energy and civil and military aviation. The Working Group has produced guidance for developers,[22] which explains the impacts

21 Defence Estates can be contacted at Blakemore Drive, Sutton Coldfield, B75 7RL. Telephone 0121 311 3847

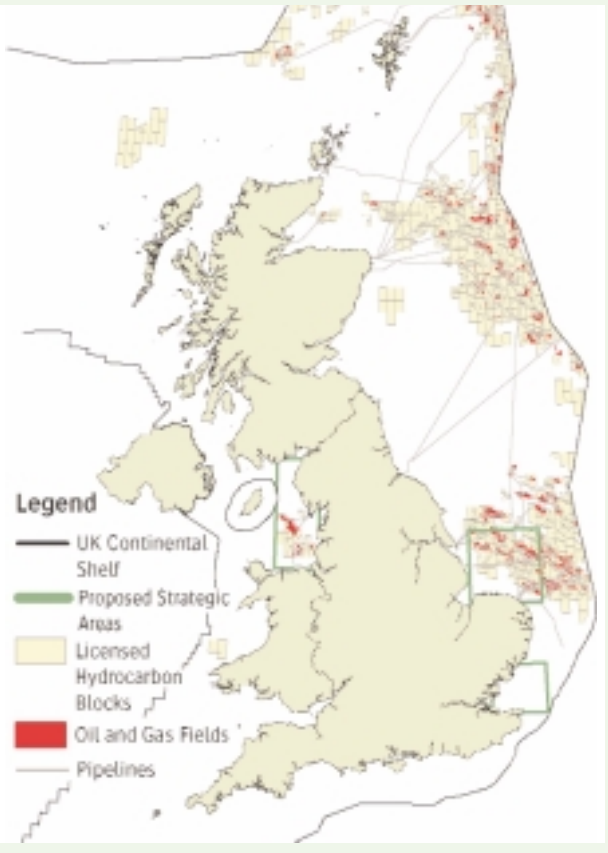
22 'Wind Energy and Aviation Interests-Interim Guidance'. Electronic copies are available from the DTI's Renewable Energy Programme website at www.dti.gov.uk/renewable/pdf.html#wind. Hard copies are available from the Renewable Energy Helpline, telephone 01235 432450 or by e-mail to NRE-enquiry@aet.co.uk.

on civil and military aviation and, where possible, outlines how these effects might be mitigated.

The Working Group has also commissioned research on the effects of wind turbines on radar. Rotating turbine blades might affect both military and civil radars in ways that could seriously compromise their operation. A computer model is being developed which will be able to predict the impact of wind farms on specific radar installations. A second study is investigating the feasibility of measures to mitigate the effect of wind turbines on radar. This may permit wind farms to be located in areas which would currently raise an objection from the MoD.

5.7 Oil and gas industry

Figure 5.5: Oil and gas licenced areas



The UK Government owns the petroleum resources of Great Britain and the territorial sea and has the right to grant licences to companies to explore for and exploit these resources as well as those on the UK Continental Shelf.

There are a number of potential areas for impacts between oil and gas and offshore renewables. However, given the fact that the UK's oil and gas industry is largely based in relatively deep water in the North Sea, it is unlikely that any significant impacts will arise in the foreseeable future, although careful planning will be needed where pipelines cross territorial waters to landfall at one of the major gas terminals on the east coast of England or in the eastern Irish Sea.

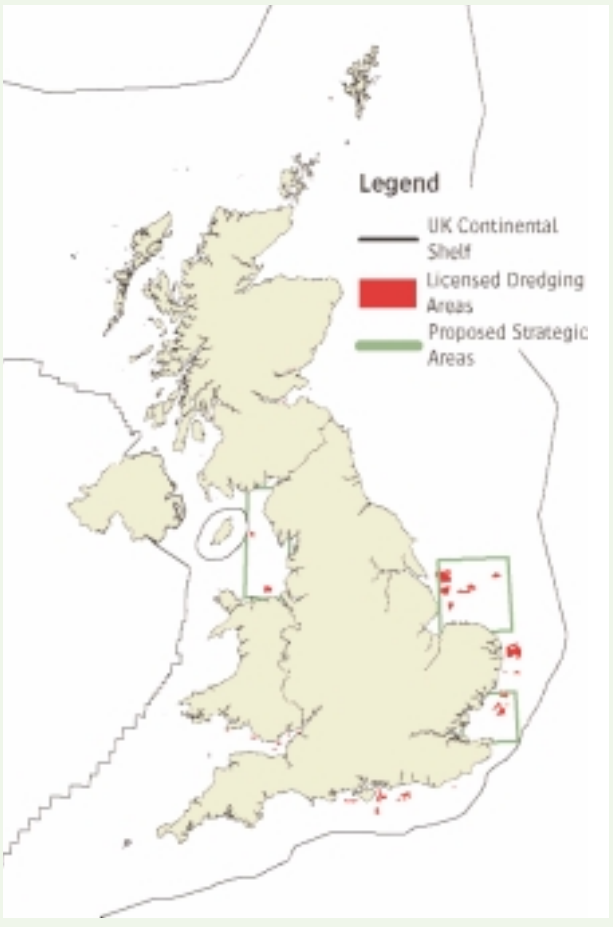
The potential for conflict is perhaps greatest in the strategic area around the Wash where there is already an extensive gas industry, and petroleum licences may be awarded (or already be in existence) in areas which are targeted by wind farm developers. There could be potential minor interactions between seismic operations and wind turbine installation where piling could affect seismic acquisition, although a time share arrangement would help to overcome this impact. However, by and large, there is no reason why the two industries should not be able to work within reasonable proximity to each other. There are already proposals to generate electricity offshore from a combination of gas and wind power and these types of project may become more prevalent as the costs of siting wind farms further offshore fall. In addition, it may be possible to share facilities in certain instances or co-locate infrastructure which will minimise impact.

There will be a need to ensure that Government establishes a co-ordinated approach to consents and approvals in these cases. In order to ensure that the opportunities for both industries are maximised, rather than one having an adverse effect on the other, there should be a close link between the processes for wind farm site leasing and the allocation of rights to explore for and exploit petroleum.

5.8 Marine aggregates

Companies tender for exclusive rights to prospect for sand and gravel resources. Almost all marine aggregates extraction takes place under licences over areas of seabed owned by the Crown Estate. Dredging licences cover approximately 1,400km2 of seabed, of which about 12% is dredged each year. There are around 70 licences in existence at present.

Figure 5.6: Marine dredging areas



Government input to the process is through the Office of the Deputy Prime Minister which is developing new statutory procedures for granting the necessary permissions. Separate permissions are granted by the Welsh Assembly Governmment and the Scottish Executive and the Department of the Environment for Northern Ireland for activities in Welsh, Scottish and Northern Irish waters. The Crown Estate will only issue a licence for extraction if a favourable Government view has been given. The licences are typically valid for 15 years.[24]

Key areas around the coast for the dredging of aggregates are the east coast of England, the South coast and the Bristol Channel and, to a lesser extent, the North West of England. The marine aggregates industry employs around 2,500 people in total both onshore and offshore.

As with the oil and gas industry, there is potential for some degree of overlap when the offshore wind industry and the dredging industry operate in close proximity to one another. However, the impact of any overlap can be minimised by the permitting authorities having due regard to the requirements of each sector: the DTI is one of the two "consultation bodies" under the procedure fo determining marine minerals dredging applications and is, therefore, consulted on alll applications at an early stage.

5.9 Marine archaeology

The construction of offshore wind farms could have an impact on sites of marine archaeological interest, including ship wrecks and human artefacts. In addition, the installation of the cabling necessary to carry electricity from the wind farm to land could disturb some sites. Therefore, it is important that developers take account of such interests at an early stage in the planning for a wind farm by consulting English Heritage for sites in English waters, or CADW (Welsh Historic Monuments) for sites in Welsh waters, or Scotish National Heritage for sites in Scottish waters.

24 More deatail on the current procedures can be found in "Marine Guidance Note 1. guidance on the extraction by dredging of sand, gravel and other minerals from the English seabed" which was produced by ODPM in July 2001.

5.10 Recreation

The inshore marine area is used by many thousands of people who participate in a wide variety of recreational activities in or on the sea - diving, yachting, watersports (for example, water skiing, paragliding etc.) and sea angling, the latter carried out onshore or from small boats.

Wind farms may impact on these activities may arise either during construction or once operational. For example, diving in the vicinity of the wind farm site during the construction when piling is taking place would probably not be feasible because of the potential danger. In many cases, local consultations will be necessary to gauge the level of recreational use of an area that might be subject to a wind farm proposal.

5.11 Local Communities

Offshore wind farms can potentially have a wide range of impacts on communities who live on land adjacent to the turbines. There may be beneficial effects on the local economy during both the construction and operational phases. Local communities may possibly experience some disruption during the construction of the wind farm and any related installations onshore. Tourism patterns might also change. Depending on the topography of the land and the distance of the wind farm from the shore the turbines may be visible to onshore communities - see 5.4 above.

As a matter of best practice it is expected that developers will engage in a dialogue with communities local to their planned wind farm at the earliest opportunity in order to discuss these kind of issues. Developers are required to take account of the effects of their project on the local environment in the environmental assessment which accompanies any application for development approval.

The formal planning process provides an opportunity for local communities to make known their views on particular projects. The DTI consults local planning authorities when considering whether to give consent to the project. Developers have to give notice of their planned project in the local press, which gives an opportunity to groups of local people or individuals to give their views to the Department direct.

STRATEGIC ENVIRONMENTAL ASSESSMENT

6

STRATEGIC ENVIRONMENTAL ASSESSMENT

6.1 What is a strategic environmental assessment?

Strategic environmental assessment (SEA) is not defined in law, but one frequently quoted definition is:

'the formal, systematic and comprehensive process of evaluating the effects of a proposed policy, plan or programme or its alternatives, including the written report on the findings of that evaluation, and using the findings in publicly accountable decision making'.

SEA extends the aims and principles of environmental impact assessment (EIA), which is carried out at the level of the individual project, to decision-making at 'strategic' levels, where alternative approaches and their implications for the environment can more easily and appropriately be considered.

For sectoral development strategies such as that for offshore wind farms, SEA can make valuable contributions to:

- identification of environmentally preferred option(s);
- early identification of areas with presumptions for/against development;
- production of development guidelines for project design, siting construction and operational management practices in relation to a preferred option and/or specific areas, thus assisting the development process for both industry and government;
- providing information which can be used in subsequent project-level EIAs, which are also helped by the earlier identification of environmentally preferred options;
- assessment of cumulative impacts of possible individual projects or actions;
- identification of any significant individual or cumulative impacts which may affect other countries ('trans-boundary' impacts).

There is no single process for conducting SEA, but there is broad agreement as to the overall approach and the methodological principles to be used. SEA can also be integrated into a wider assessment framework which identifies the social and economic effects of proposals and how such proposals relate to the principles of the Government's Sustainable Development Strategy.

6.2 The SEA Directive

European Directive 2001/42/EC 'on the assessment of the effects of certain plans and programmes on the environment', known as the 'strategic environmental assessment' or SEA Directive (although it does not use that term), must be transposed into UK law by July 2004. It is expected to apply to the plans for offshore renewables development presented in this consultation paper.

Where an SEA is required under the Directive, the authority responsible for the plan or programme will need to follow a specified procedure during its preparation. An environmental report must be prepared which examines the likely significant effects of the proposed plan or programme, including reasonable alternatives, as well as other information listed in an Annex to the Directive. In deciding on the content and level of detail of an SEA report, the authority will need to consult environmental authorities (to be defined by the Member States). The environmental authority and the wider public must then be given an 'early and effective opportunity' to comment on the draft plan or programme and accompanying report.

The following information must then be made available to the public:

- the adopted plan or programme;
- a summary of how environmental considerations have been integrated into the plan or programme and how the SEA report and consultations have been taken into account;

- the reasons for choosing the plan or programme adopted, over of the other reasonable alternatives dealt with; and
- arrangements for monitoring environmental impacts.

The requirements of an environmental assessment under the SEA Directive are summarised in Box 6.1.

Although the Directive is not yet in force, carrying out a formal SEA will provide helpful support to the development and refinement of plans for expansion of the offshore wind farm industry. The government has therefore decided to act within the spirit of the Directive, and has commissioned the first phase of SEA work, focussing on the three strategic regions. The SEA report will be used to inform plans leading up to the announcement of the next round of offshore windfarm site leasing.

6.3 Experience in the oil and gas sector

There is relevant experience to be gained from the application of SEA to the UK Oil and Gas sector, where the DTI has embarked upon a comprehensive process of SEA for the UK Continental Shelf. In 1999/2000 the DTI conducted the first SEA, for an area to the north-west of Shetland. The DTI has since commissioned a series of SEAs, with the ultimate objective of assessing the remaining unlicenced areas of the UKCS. The DTI's SEA programme for the oil and gas sector is presented and explained on the web site www.habitats-directive.org

The estimated length of time to complete the SEA process for all the areas is five years, and as areas are completed, those parts determined suitable by the SEA process can be released for licensing to developers. The SEA work within the first two areas is already complete and Petroleum Production licences have been issued.

However, there are some fundamental differences to be appreciated when comparing the application of SEA to the oil and gas sector. The oil and gas sector is a mature industry in contrast to the offshore wind industry which has different impacts and issues, many of which are relatively unknown and cannot currently be predicted with any certainty as there is no monitoring information available.

Although the two sectors will have a different approach to SEA, the oil and gas SEA work does provide the offshore wind energy sector with a number of potential opportunities and cost and time savings. In particular considerable data and information collection has been undertaken for the various oil and gas SEA areas and, where appropriate, these data will be used to support offshore wind SEA work.

6.4 The application of SEA to marine renewables

6.4.1 PROPOSED APPROACH

Given the constraints of conducting an SEA process for a new industry where potential impacts are unknown or uncertain, the best approach is a phased programme of work, focussing initially on the strategic regions proposed for the next round. The first phase will also identify baseline data, and applying various development scenarios, will predict impacts where it is possible to do so. This phase of work will also identify where gaps exist in baseline data and impact uncertainties, and where possible, either fill the gaps or establish the programme of work required through monitoring, further data collection or generic impact studies. When available, this information will be used to refine the SEA.

Box 6.1: Elements of an Environmental Assessment under the SEA Directive

Preparation of an environmental report in which the likely significant effects on the environment of implementing the plan, and reasonable alternatives taking into account the objectives and geographical scope of the plan, are identified, described and evaluated (Arts. 2(c) and 5).

The information to be given is (Annex 1):

- an outline of the contents, main objectives of the plan, and relationship with other relevant plans and programmes;
- the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan;
- the environmental characteristics of areas likely to be significantly affected;
- any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;
- the environmental protection objectives, established at international, Community or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation;
- the likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors (these effects should include secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative impacts);
- the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan;
- an outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;
- a description of the measures envisaged concerning monitoring;
- a non-technical summary of the information provided under the above headings.

The report shall include the information that may reasonably be required taking into account current knowledge and methods of assessment, the contents and level of detail in the plan, its stage in the decision-making process and the extent to which certain matters are more appropriately assessed at different levels in that process in order to avoid duplication of the assessment (Art. 5.2)

Consultation:

- of environmental authorities when deciding on the scope and level of detail of the information which must be included in the environmental report (Art. 5.4)
- of environmental authorities and the public, which shall be given an early and effective opportunity within appropriate time frames to express their opinion on the draft plan and the accompanying environmental report before the adoption of the plan (Art. 6.1, 6.2)
- of other EU Member States where the implementation of the plan is considered likely to have significant effects on the environment of those States (Art. 7)

The environmental report and consultations must be taken into account in decision-making (Art. 8)

Provision of information on the decision (Art. 9):

When the plan is adopted, the public and any EU Member State consulted under Art.7 shall be informed and the following items made available to those so informed:

- the plan as adopted
- a statement summarising how environmental considerations have been integrated into the plan and how the environmental report of Article 5, the opinions expressed pursuant to Article 6 and the results of consultations entered into pursuant to Art. 7 have been taken into account in accordance with Art. 8, and the reasons for choosing the plan as adopted, in the light of the other reasonable alternatives dealt with
- the measures decided concerning monitoring (Art. 9)

Monitoring of the significant environmental effects of the plan's implementation (Art. 10)

Quality assurance: environmental reports should be of a sufficient standard to meet the requirements of the SEA Directive (Art. 12.2)

By this approach, the SEA takes an experimental dimension with an integral learning process. The outcome will be an SEA Report to inform decisions on the strategic direction to be followed and to provide information useful to both the regulatory authorities and developers. This is a proactive and flexible approach that acknowledges there may be risks, but manages them down to acceptable levels.

The Government proposes to follow this approach for marine renewable SEAs. It is likely that the scope will include:

- areas beyond the 12-nautical-mile limit to ensure all impacts are examined;
- a time horizon covering at least the Government's commitments regarding renewable energy targets and the lifetime of the developments; and
- inked landfall development, but not other onshore facilities linked to offshore energy generation.

It is envisaged that the SEA will be incorporated into a wider assessment which should identify significant social and economic impacts, including possible impacts on other users of the sea. Impacts of all alternatives and for different phases in the wind-farm life cycle will be assessed. The focus will be on opportunities and benefits as well as risks and adverse impacts. Further, the SEA will consider the likely impacts of environmental change (unrelated to wind generation) on wind farms.

The examination of likely cumulative impacts will be a central focus. The cumulative impact analysis will cover:

- the combined impact of a number of marine renewable generation installations; and
- the combined impact of marine renewable installations with any other relavant activities.

The scoping consultation exercise will identify a range of impact issues which will need to be assessed in the SEA. Additionally, in carrying out an SEA further impacts may be identified.

6.4.2 IMPACT MITIGATION AND MONITORING

The SEA will assist identification of a preferred strategy or 'way forward'. It may recommend mitigating measures that must be integrated into the siting and design of individual wind farms. This should be a major factor in avoiding environmental damage.

It is envisaged that the SEA will identify explicitly the decision-making risks arising from lack of data or uncertainty, and make clear recommendations for studies to provide the requisite data and to establish institutional and funding mechanisms in order to ensure feedback to the SEA process and input to other databases.

The SEA report will comply with the requirements of the Directive. A draft will be prepared for stakeholder consultation. The SEA report will provide clear guidance to:

- assist developers to prepare cost-effective EIAs for individual wind farms; and
- establish criteria to assist the competent authorities and other agencies make decisions regarding applications for consents.

A statement will be issued disclosing the way in which environmental considerations were integrated into decision-making on the framework for developing and refining plans for expansion of the offshore wind farm industry.

6.5 Outcomes of SEA

Specific outcomes will be determined once detailed Terms of Reference for the SEA are agreed. However, possible outcomes that will inform strategic-level decisions include:

- identification of areas where there would be a presumption in favour of development, those where there would be a presumption against development, areas where special conditions may be applied and possibly areas that could not be developed because of their sensitivities;
- recommendations as to characteristics of licensing rounds or changes to other consenting frameworks;
- recommendations or criteria regarding optimal development of areas where there would be a presumption in favour of development (eg maximum size and number of wind-farm sites);
- criteria for guiding siting, construction and operational decisions by operators;
- data to be used by all those responsible for EIAs for offshore developments, and guidance on precautionary practices; and
- an input towards an integrated and coherent approach to wider issues of sea-use planning.

The Government has commenced an SEA process, the first phase of which is due to be completed in January/ February 2003. Within the first two or three months the major risks and uncertainties should be identified, and work identified to provide data in order to reduce them. This approach should:

- highlight where data and information are lacking;
- identify programmes of survey and research to collect and collate such data;
- help establish the need for a coordinating mechanism and decision support group, such as an advisory group(s) and a central GIS facility to manage the data (perhaps an extension of Windbase);
- enable better informed decisions to be made on the initiation of new consent rounds (or an alternative procedure) on the basis of an increase in 'controlled uncertainty';
- assist the regulators and the operators make more environmentally aware decisions in a transparent manner.

The main steps in the workplan for the SEA are as follows:

1. Establish SEA Steering Group

2. Scoping

3. Establish and maintain SEA website

4. Environmental baseline description

5. Develop the scenarios

6. Impact prediction and evaluation

7. Formulate guidance for future development of the strategic focus areas

8. Preparation of SEA report

9. Public consultation

10. Prepare summary of consultation responses

ISSUE 14. *Comments are invited on the Government's proposal with regard to the SEA.*

THE CONSENTS PROCESS

7

7.1 Introduction

The consents process enables Ministers (or in certain cases Departmental officials) to come to a decision on whether a particular offshore wind farm or other marine renewable energy generation project should be allowed to proceed. In reaching a decision the potential benefits of the project in contributing to Government policy objectives are assessed against any likely adverse impacts. The kind of possible impacts were outlined in Chapter 5. Procedures for consulting those with an interest in a development or those likely to be affected by it are built into the process.

The consents process examines the impact of the specific project for which development consent is being sought. Its focus is therefore narrower than the strategic environmental assessment outlined in Chapter 6 which informs the broader policy and strategic framework.

The characteristics of an ideal consents process are that it should be efficient in producing a decision as quickly as possible without compromising the thoroughness with which all the issues arising from a particular application need to be considered. The process should also be clear and straightforward so that the administrative and cost burden on the applicant is minimised. Applicants should be able to understand easily how the process works and what is required of them. A related point is that the process needs to be readily accessible to others with an interest in a development so that they are able to make their views known. Decisions taken on applications must be consistent with each other and transparent so that it is clear why a particular decision has been taken.

7.2 The legislative basis for the consents process for renewable energy generation projects in territorial waters

There are two main legislative routes for the Government to grant consent to offshore wind farms in territorial waters, and it is up to developers to choose which is the most appropriate for their particular scheme. The developer can seek consent under:

- Section 36 of the Electricity Act 1989 and section 34 of the Coast Protection Act (CPA) 1949; or
- an order under the Transport and Works Act (TWA)1992.

In both cases, a licence under Section 5 of the Food and Environment Protection Act (FEPA) 1985 is needed.

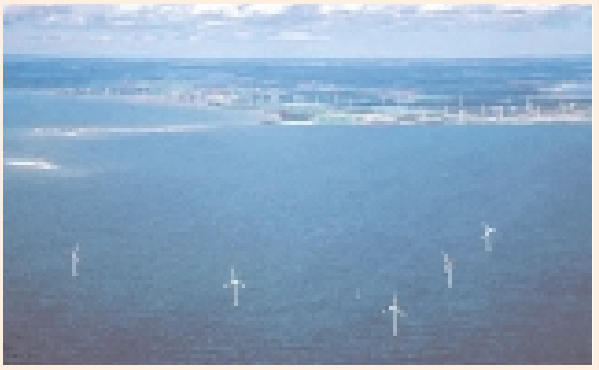
THE ELECTRICITY ACT/CPA/FEPA ROUTE

Section 36 of the Electricity Act 1989 requires developers to obtain a consent from the Secretary of State (for Trade and Industry) for the construction, extension or operation of a generating station of a capacity above the permitted capacity, which for offshore wind and water driven generating stations in the territorial waters surrounding England and Wales is 1MW. Section 36 consents for generating stations located in Scotland rest with Scottish Ministers. At present in Scotland only generating stations with a capacity above 50 MW require Section 36 consent, although the Scottish Executive plans to align its legislation for offshore generating stations with that of England and Wales.

The Environmental Impact Assessment Directive requires an environmental assessment to be made of the effects of certain public and private projects, including energy projects. This directive is given effect for electricity generation projects in England and Wales by means of the Electricity Works (Environmental Impact Assessment) Regulations 2000. It is DTI policy to require EIAs for all offshore wind farms. Under the Conservation (Natural Habitats, &c.) Regulations 1994 which implement the Habitats Directive in territorial waters, the Secretary of State has to consider the effect of the development on European sites in Great Britain in considering whether to grant a Section 36 consent.

Under Section 34 of the Coast Protection Act 1949, consent from the Minister for Transport is required to construct, alter or improve any works below the level of mean high water springs, or to deposit or remove any object or materials from this area. The purpose of the consent requirement is to ensure that marine works will not be detrimental to navigation. The consent process for England and Wales is managed by the Department for Transport. The Scottish Executive determines applications relating to developments in territorial waters adjacent to Scotland.

Under part II of the Food and Environment Protection Act 1985, a licence is required for the placement of materials or structures in the sea, and for the depos it of dredged materials. The purpose of the legislation is to protect the marine ecosystem and human health, and to minimise nuisance and interference to other legitimate uses of the sea. Defra is responsible for FEPA applications within English waters and administers the process within Welsh waters on behalf of the Welsh Assembly Government. The Scottish Executive is responsible for licensing developments in territorial waters adjacent to Scotland.



Bockstigen wind farm, Sweden

TWA/FEPA ROUTE

An alternative route to approval is for the developer to apply to the Secretary of State (for Trade and Industry) for an Order to be made under Section 3 of the Transport and Works Act 1992. The Act enables the Secretary of State to make an Order relating to the carrying out of certain works which interfere with rights of navigation in waters within or adjacent to England and Wales, up to the seaward limits of the territorial sea. The Order can include a provision which specifically extinguishes public rights of navigation over water and can therefore provide a statutory defence against a claim of public nuisance for interfering with navigation rights. It is unclear whether the Electricity Act/CPA route achieves a similar effect.

By virtue of section 16 of the Act the Secretary of State may issue a planning direction under Section 90 (2A) of the Town and Country Planning Act 1990 deeming planning permission to be granted for the works authorised by a TWA Order. As with section 36 of the Electricity Act, therefore, a developer can request deemed planning permission for ancillary on-shore works when applying for a TWA Order for off-shore works. The Welsh Assembly Government deals with Orders for projects in territorial waters adjacent to Wales. The Act does not extend to Scotland where developers would need a private bill under sections 28 and 29 of the Scotland Act 1998.

7.3 The consents process and other legislation beyond territorial waters

Chapter 3 outlined the need for legislation to establish a Renewable Energy Production Zone beyond territorial waters and to vest the ensuing development rights with a competent authority. Legislation will also be needed to create a comprehensive consents framework for projects beyond territorial waters. Some elements of this consents process are already in place. The licensing requirement in FEPA outlined above and Section 34 of the CPA already apply beyond territorial waters. However, it is highly unlikely that Section 36 of the Electricity Act extends beyond territorial waters. The regime established in the Electricity Act for the licensing (and exemption) of generators will also need to be extended so that there are common rules in territorial waters and beyond. The scope of Section 3 of the Transport and Works Act 1992 does not extend outside the limits of the territorial sea.

Legislation will be needed to regulate such matters as the lighting of the installation to ensure that it is not a hazard to aircraft. The Government would also want to extend the Health and Safety at Work Act 1974 to marine generation in the Renewable Energy Production Zone, although this could be achieved using secondary legislation. A major gap in the legal regime beyond territorial waters is the lack of either criminal or civil jurisdiction. This means, for example, that a person could damage a wind farm and no action could be taken in either criminal or civil law. The Petroleum Act 1998 contains order-making powers to enable the criminal and civil law to extend to oil and gas installations, and a similar model could be used to protect marine renewable energy assets.

7.4 Improving the consents process

7.4.1 INTRODUCTION

Experience of consenting wind farms in the first round of development has shown that the current consents process can be made to work adequately, but it has experienced teething problems some of which may be persistent. None of the legislation outlined in section 7.2 was framed specifically with offshore wind farms in mind and the various statutory consents regimes do not fit together into a seamless and coherent whole. For example, there is some duplication between the consents, compounded by uncertainties about the timescales for processing applications, as well as different arrangements for the charging of fees and for public consultation. A specific issue of concern is the lack of clarity about the extinguishment of navigation except by means of a TWA Order. When judged against the criteria of an ideal consents process outlined in section 7.1 above a number of shortcomings in the existing procedures are apparent and we believe there is room for improvement.

Some of the shortcomings such as administrative complexity are generic to many other marine consents. The Government is currently undertaking a regulatory review of development in coastal and marine waters, details of which are given in section 7.4.2 below. DTI is working closely with the review team and is providing an input into how the current consents process for wind farms could be improved as a contribution to the wider study.

Other possible reforms which are related to the specific consents process for offshore wind farms and which it may not be possible to address within the general review, are outlined in section 7.4.3 below.

7.4.2 REGULATORY REVIEW OF DEVELOPMENT IN COASTAL AND MARINE WATERS

The objective of this wide-ranging review is to reduce the complexity of the regime governing development in coastal and marine waters in England and Wales by:

- identifying essential principles to underpin the development regime and assessing how far these are currently met;
- making proposals for simplifying and reducing the cost and burden of existing consent processes in the short term;
- making recommendations for longer term reforms with the objective of delivering sustainable development through a modern, transparent, efficient and effective coastal and marine development system.

This should make it easier for business to conduct operations in the sea by reducing the complexity of the regime governing development while ensuring that the Government's objectives for the protection of the marine environment can be met and by preventing unnecessary interference with other legitimate users of the sea. It can be seen therefore that the review shares the same objectives as this consultation paper. The review team will report its preliminary findings to Ministers towards the end of 2002 and will publicly consult on recommendations in spring 2003.

7.4.3 REFORM OF CONSENTS FOR WIND FARMS

We believe that there are two main areas where specific improvements could be made to the consents process for wind farms. The first relates to the extinguishment of public rights to navigation in the territorial sea. The second is concerned with the role of the local planning authority in the Section 36 process.

EXTINGUISHMENT OF RIGHTS TO NAVIGATION IN TERRITORIAL WATERS

By virtue of section 3(1)(b) of the Transport and Works Act an Order can specifically authorise works which interfere with rights of navigation within the territorial sea. Provided a developer is not negligent in exercising the statutory power to interfere with rights of navigation conferred by a TWA Order, a claim for nuisance or damage arising from those works cannot be made against the developer. It is not certain whether the Electricity Act and the CPA extinguish public rights to navigation so developers, for whom the clear extinguishment of rights is important to their project, may be deterred from using this consenting route. There is no explicit reference in either Act which would be a statutory defence to a claim of public nuisance, and it is open to doubt whether there is an implied statutory defence. The matter has not been tested in the courts. The issue could be clarified by introducing text into either statute to put the matter beyond any doubt.

Introducing a power to extinguish rights to navigation into the CPA would have certain implications. The consenting process under the CPA is different from both the Electricity Act and FEPA, in that it is less formal and structured. The removal of public rights of navigation should not be undertaken lightly and full public consultation with interested parties would be necessary before a decision was made on an application. At present, there is no statutory requirement in the CPA for consultation, except for

those elements of the project which are subject to an environmental impact assessment. However, the Department for Transport consults on an informal basis. It would be necessary to put the whole consenting process on a more formal footing to ensure that the case for granting the extinguishing of the public right to navigation in respect of a particular wind farm was considered thoroughly.

These same considerations do not apply in the case of the consent under Section 36 of the Electricity Act 1989, which already has a formalised structure. It would be possible to extinguish rights to fishing as well as navigation by this route. Amendment to the Electricity Act rather than the CPA may therefore be the better option.

Another way of approaching the issue would be to create exclusion zones around wind farms, possibly within which rights to navigation and fishing were extinguished. Such exclusion zones of 500 metres have already been used to good effect to protect oil and gas installations. They would protect both wind farms and shipping from damage to each other. However, it might be necessary, to provide for certain exceptions to cope with emergency situations and, for example, to allow maintenance work. The Government recognises that exclusion zones in fishing grounds might be unattractive to the fishing industry.

Primary legislation would be needed both to extinguish public rights to navigation and fishing, and to create exclusion zones around wind farms. The ideas outlined above could only therefore be implemented in the long term.

ISSUE 15. *Views would be welcome on the legislative changes suggested to extinguish public rights to navigation and possibly also fishing, and to create exclusion zones around wind farms.*

THE ROLE OF THE LOCAL PLANNING AUTHORITY IN THE SECTION 36 CONSENTS PROCESS

(i) The onshore elements of offshore wind farms

The powers of local planning authorities set out in the Town and Country Planning Act 1990 extend to the mean low watermark (although there are certain local Acts which extend the seaward boundaries of some local planning authorities, for example in the Humber, the Solent and the Bristol Channel). Developers can choose between two approaches in seeking planning consent for the onshore elements of an offshore installation, such as cabling and the construction of an electrical substation. The developer can seek planning permission for these onshore elements from the local planning authority. Alternatively, Section 90 of the Town and Country Planning Act enables the developer to seek deemed planning permission for them as part of the application for consent under Section 36 of the Electricity Act for the offshore generator. In such cases the Secretary of State for Trade and Industry will consider whether to grant consent for both the onshore and offshore elements of the project.

(ii) Offshore wind farms

There is an anomaly in the Section 36 power for consenting offshore generation in regard to the role of the local planning authority. Schedule 8 of the 1989 Act requires notice of a Section 36 application to be served on 'the relevant planning authority', which is defined in relation to England and Wales with reference to the Town and Country Planning Act 1990. The power of the local authority is substantial; it can object to a proposal and force a public inquiry to be held. However, as pointed out above, the powers of local authorities do not extend below the mean low watermark. It could be argued therefore that there is no 'relevant planning authority' for offshore renewables.

The Government would like to clarify the role of the local planning authority in respect of offshore renewables, although primary legislation would be needed to change the current procedure established in the 1989 Act. There is no doubt that offshore renewables generally are likely to have some impact on the land, for example they may be visible from the shore; tourists may visit the wind farm; and there may be increased activity from local ports. It will therefore be important for the Department to consult local planning authorities in regard to individual applications for Section 36 consent.

The degree to which individual installations will have an impact on the land will depend on various factors, most notably how far the installation is located from the shore and its type. However, it would be excessively complex to try to make a system of consultation dependent on such impacts, which will vary from case to case. A simpler approach would be to give local authorities the status of statutory consultees who must be consulted in respect of every offshore renewables installation, but make it clear that they could not force a public inquiry. Such a procedure would enable the voice of the local planning authority to be heard, but would allow the Secretary of State to weigh up all the objections on their merits before deciding whether a public inquiry should be held.

Construction of turbines for Horns Rev wind farm, Denmark

The issue of which local planning authority should be consulted also needs to be addressed. The approach taken in the Electricity Works (Environmental Impact Assessment) Regulations 2000 (whereby the local planning authority has to be consulted about whether a development is an EIA development) is to leave it to the Secretary of State to decide which local planning authorities or other authorities are the most appropriate consultees for a proposed development 'in, on, over or under the sea'. As well as providing consistency between these Regulations and the Section 36 consent (which are interlinked in any case), this formulation would give the Secretary of State the flexibility needed to decide what is best in individual cases. In most cases it would be the local authority adjacent to the development. However, there could be a range of circumstances where this might not be an appropriate outcome-for example, where a wind farm is located in an estuary between two land masses.

ISSUE 16. *Comments would be welcome on the proposed clarification of the role of local planning authorities.*

7.4.4 TAKING FORWARD REFORM TO THE CONSENTS PROCESS

The Government is committed to exploring any avenue which offers an opportunity to improve the consents process for wind farms. The Government's wider review of marine consents is an excellent opportunity to tackle some of the problems which are common to development consents for marine projects. The Government will be consulting on proposals during 2003 although this exercise will not affect the outcome of the present consultation in relation to the issues identified earlier in this chapter which are specific to the consents process for offshore wnd farms. The latter will be pursued, if necessary, through earlier legislation.

Additionally DTI will work with colleagues in other Government Departments who are responsible for individual consents for wind farms to streamline further the administration of the current wind farm consents process, in line with the objectives of the general review of marine consents. This work will explore the feasibility of having one main point of contact for applicants and consultees and for managing progress on behalf of other Departments.

ISSUE 17. *Views would be welcome on the proposal to further streamline the administration of the consents process by establishing one main point of contact for managing progress.*

THE PROVISION AND REGULATION OF OFFSHORE INFRASTRUCTURE

8

THE PROVISION AND REGULATION OF OFFSHORE INFRASTRUCTURE

Offshore cables form an important part of the costs of marine generation. There may also be significant onshore reinforcement costs when such sites are connected to the electricity networks. Therefore, ensuring that infrastructure is provided and priced efficiently is important for the success of the offshore wind strategy. Onshore reinforcements are dealt with at the end of this section.

8.1 Who should provide the cables?

In principle, the licences of the transmission system operators (TSOs) and distribution network operators (DNOs) could be amended so that they were obliged to finance the construction of offshore infrastructure as part of their regulated businesses, and to offer capacity on the basis of a uniform tariff for new connections. This arrangement would put offshore developments on a par with onshore development in respect of the right to connections.

Alternatively, the responsibility for providing offshore cables could be left to non-regulated businesses: the offshore generation industry and/or third party providers. It is worth noting that the transmission and distribution companies may well wish to enter a competitive market for establishing new cable links as part of their non-regulated businesses.

The Government's conclusion is that, although extending the licences of the TSOs and DNOs offshore might be a workable solution, there are no compelling reasons for adopting this approach, rather than leaving the responsibility for providing infrastructure with offshore generators and third party providers. In particular, it is not clear that the regulated businesses of the transmission and distribution companies would have better incentives to invest efficiently in new cables than non-regulated businesses.

ISSUE 18. *Comments are invited on the conclusion that there should be no extension to the licences of the transmission and distribution companies.*

8.2 Regulating offshore infrastructure

In many cases, the industry itself can be expected to provide offshore cables efficiently. For example, where there is a dedicated cable linking a single wind farm to the shore, the cost of the cable can be treated in the same way as any other cost component of the wind farm. Equally, in regions with several adjacent wind farms, developers have an incentive to co-operate in building the required infrastructure in order to exploit economies of scale in the laying of sub-marine cables. This is one of the main benefits of confining development to defined rounds in strategic areas.

The issues are more complex when wind farms are built sequentially, and a newcomer requests access to existing cable infrastructure. In these circumstances a cable owner might try to act as a monopolist by charging a price in excess of the unit cost of its cable capacity. The effect could be to deter some of the more marginal wind-farm developments. There could also be adverse effects arising from the vertical links between the ownership of offshore generation and infrastructure assets. A marine generation developer might have an incentive to restrict rival developers' access to its cable, in order to limit new entry into the renewable energy market and secure development opportunities for itself.

This suggests that there is the need for some regulatory safeguards to ensure fair competition in the provision of offshore cable services There are two options: to rely on competition law; or to design a separate offshore regime.

8.3 Reliance on competition law

General competition legislation will apply to offshore infrastructure. European competition legislation (which applies to activities which may have an effect on inter-state trade) prohibits anti-competitive

agreements, decisions and concerted practices under Article 81 of the Treaty establishing the European Community, and abuse of a dominant position under Article 82. The Competition Act 1998 has now introduced similar prohibitions into UK law, subject to certain transitional arrangements. The UK competition authorities, including Ofgem, will as far as possible follow European jurisprudence in applying the 1998 Act.

Recent competition cases have demonstrated that refusal of access to certain facilities can constitute an abuse, as can excessive pricing. A marine developer that believed a cable owner was unreasonably refusing access or demanding an excessively high charge could therefore complain to Ofgem. However, the Competition Act and EC competition law do not include specific provisions regarding access to offshore electricity cables and will not necessarily apply to every cable owner, depending on the latter's market position. Therefore there may be some uncertainties about how reliance on competition law alone would work in practice.

8.4 A new regulatory regime

An alternative would be to set up a new regulatory regime tailored to the needs of marine generation. Such a regime would complement (not replace) competition law but could add specific rules and dispute resolution procedures and ensure that all cable operators were caught. It might have the following objectives:

- to facilitate coordination in order to exploit economies of scale in laying cables;
- to ensure that the access arrangements to cable infrastructure promote effective competition and facilitate efficient entry into the offshore wind generation market;
- to facilitate efficient new investment in offshore cables.

As discussed, the promotion of coordination might largely be achieved through the design of the licensing process. For example, fixed licence rounds and the dissemination of information about planned developments might help marine generation developers identify where coordination would bring benefits. Other measures might include setting up a voluntary industry forum to promote discussion, and relaxing the confidentiality requirements that prevent TSOs and DNOs from encouraging coordination between different parties requesting a connection.

So far as access arrangements are concerned, the best option would appear to be to establish a regime which

- requires cable owners to make available to the market any spare capacity, unless they can justify why it should not be made available (eg substantiated plans for using the capacity for their own future generation, or good technical reasons); to apply cost-reflective charges; and to provide access on a non-discriminatory basis.
- establishes a process for resolving disputes, administered either by DTI or by Ofgem.

This would leave the market to provide and price infrastructure for most wind-farm developments, but puts in place a safeguard to meet those circumstances where a cable owner demands an unreasonably high charge.

There are a number of precedents to suggest how a regime might be operated:

- The regime for oil and gas pipelines in the North Sea, where third party access to infrastructure is by negotiation. The Petroleum Act 1998 and other legislation provide for appeal to the Secretary of State to settle disputes over third-party access, including setting a tariff. Although formal dispute resolution has never been requested, the DTI has recently clarified how these powers would be

used.[25] The guidance suggests that tariffs for pipelines built to take third-party access would include capital costs, but only incremental costs would be considered for pipelines where the owner had already recovered capital costs.

- The connection charge arrangements for distributed generation. These charges must be cost-reflective, and distributed generators have the right of appeal to Ofgem if they believe that their connection charge is excessive.
- The provisions in the market for entry capacity rights to the GB gas transportation network. Transco is required to employ 'use-it-or-lose-it' provisions to prevent market abuse and in particular, capacity hoarding. Ofgem will also be proposing similar provisions in respect of electricity interconnectors in a forthcoming consultation document and for access rights to the England and Wales electricity transmission network, when these are introduced.

Of course none of these cases is exactly similar to offshore wind generation, and it would be necessary to establish a regime that was appropriate for the specific circumstances of the new industry.

It would also be necessary to decide how such a regime should be set up, implemented, and enforced, and whether the DTI or Ofgem would be better placed to administer the system. The choice is likely to depend partly on which body has the expertise and resources to carry out the function

It should be noted that European legislation is currently being developed which may be relevant to the treatment of offshore cables.[26] It is suggested that it would be preferable to delay finalising the long-term arrangements until the prospective European legislation is clearly defined.

25 DTI, 'Consideration of Applications for Resolution of Disputes over Third Party Access to Infrastructure: Guidance to Parties in Dispute'.

26 Commission proposals to amend Directives 96/92/EC and 98/30/EC concerning common rules for the internal market in electricity and gas.

ISSUE 19. *Comments are invited on:*
(a) the extent to which general competition law can and should be relied on; and
(b) whether a new regime should be established which requires cable owners to make available to the market any spare capacity, and if so, on what principles it should be based.

8.5 Onshore network provision

A factor that may constrain the location of offshore generation is the availability of network connections onshore to export the power to centres of demand. Installations of about 300 MW or greater are quite likely to connect to the high-voltage national grid, rather than to the lower-voltage distribution networks.

National Grid Company plc, which runs the national grid, publishes an assessment of available capacity for each region and updates this regularly in its Seven Year Statement. However, the Seven Year Statement is based on the contracted position of NGC's customers and gives quite general guidance.

A much more detailed analysis has been considered in the DTI co-ordinated workstream, the Transmission Issues Working Group (TIWG). As part of the work completed for TIWG, NGC conducted a study that examined the scenario where 6 GW of new renewable generation connected to the transmission system in England and Wales, 4.9 GW of which was assumed to be offshore wind. In addition, the study assumed 2 GW of new onshore wind generation in Scotland.

The study assessed the extent to which system reinforcements would be required to cope with the additional generation load, and provided cost estimates where reinforcements were identified as necessary. Table 8.1 shows the estimated costs of reinforcement that were driven by the assumed offshore wind developments.

Table 8.1: Transmission network reinforcement costs estimated by NGC

Region	Estimated reinforcement costs (£m)	
	Min	Max
North West	205	525
The Wash	40	50
Thames Estuary	30	40
Total	**275**	**615**

Note: These costs have not been verified by Ofgem. They are indicative and may be sensitive to the assumptions that NGC has made.
Source: Based on NGC presentation to TIWG on 9 July 2002.

Given NGC's shallow connection charging policy, these costs would not form the basis of connection charges, but would rather be additional capital expenditure to be recovered from all users through transmission network use-of-system charges (TNUoS).[27] However, the cost estimates provide some indication of the likely extent of reinforcement that may be required, and as a result the likely investment lead time.

The NGC study indicates that considerable amounts of new capacity could be accommodated in the Greater Wash (3,000 MW) and the Thames Estuary (1,000 MW) with relatively low levels of reinforcement. These costs are associated with substation reconfigurations and reactive compensation. The study, therefore, indicates that, apart from the North West, significant amounts of new connection may be possible without substantial system reinforcement.

27 TNUoS charges are calculated on an investment cost related methodology and therefore vary according to the location of generation and demand. Details of current TNUoS charges can be found in NGC's publication "The Statement of Use of System Charges, April 2002"(available at www.nationalgrid.com/uk/indinfo/index/html)

TIMETABLE

9

9.1 The next round

The detailed terms of the competition for the next round will be announced following consideration of the responses to this consultation and of the consultation on the SEA report as outlined in Chapter 6. It is expected that an announcement on the competition arrangements will be made in April 2003.

Plans for the timetable for the competition are as follows:

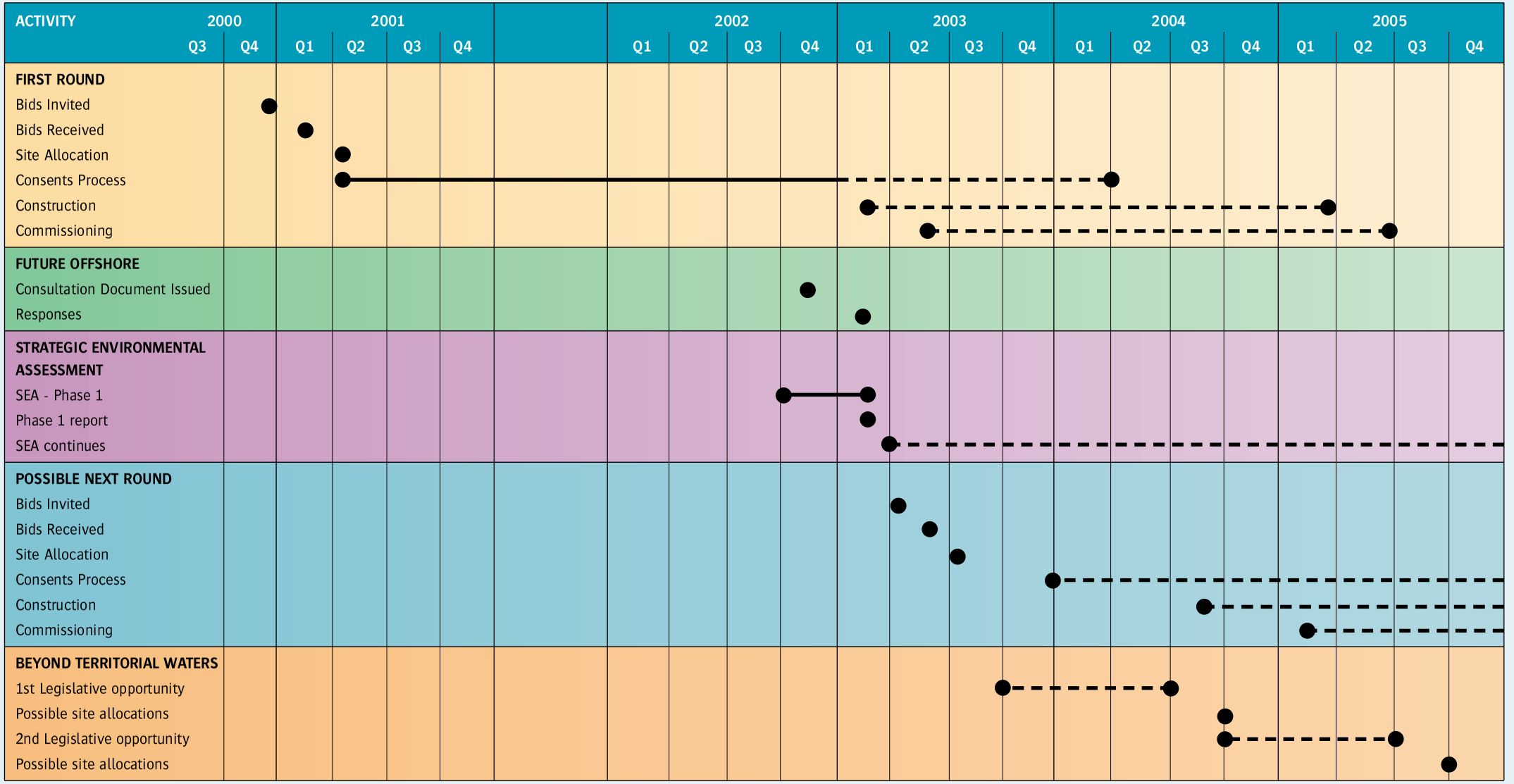
- an invitation to bid into tender rounds will be issued in April 2003. These rounds will focus on the three strategic areas, and will be for development leases within territorial waters and exploration licences beyond the boundary of territorial waters.
- applications for leases and licences will need to be submitted two months after call for tenders, during June 2003.
- decisions would be announced in August 2003. There will be no appeal against the Crown Estate's decisions.

ISSUE 20. *Views are invited on the proposed processes and timetables for the next round and the strategic environmental assessment.*

9.2 Future rounds for development licences outside territorial waters

As explained in Chapter 3 it will not be possible to organise a competition for site licences to develop wind farms beyond territorial waters until primary legislation is in place. It is not possible to indicate when a place in the Government's legislative programme will become available. The legislative session usually runs each year from the Autumn until Summer recess the following year. The earliest opportunity to legislate would be in the 2003/04 legislative session, which would enable a competition to be organised in the Summer of 2004. The next opportunity would be the Summer of 2005, if a Bill was introduced during the 2004/05 legislative session.

Table 9 Timetable for consultation, SEA and proposed future rounds



ANNEX A

Summary of issues for consultation

Comments and views are welcome on any aspects of the consultation document and in particular on the specific issues raised in the document.
For ease of reference these are reproduced below.

Chapter 3:
A legal framework for offshore renewables

ISSUE 1. *The urgency with which new legislation is needed to allow developments outside territorial waters.*

Chapter 4:
Allocation of rights - the second and future rounds

ISSUE 2. *How best the allocation process can be tailored to optimise the development potential within the context of strategic environmental assessment.*

ISSUE 3. *Whether developers should have freedom to propose the exact size and shape of block they wanted, subject to criteria applied in the selection process, or whether developers should be invited to bid for one or more blocks. Comments are also invited on the appropriate block size if the latter option is adopted.*

ISSUE 4. *The proposal to offer leases in fixed, geographically defined regions, following strategic environmental assessment.*

ISSUE 5. *The proposal to limit development to three strategic areas in the fashion described, and on the proposed boundaries of the strategic areas. (Developers who wish to pursue sites outside the boundaries should inform the DTI in their responses to this consultation).*

ISSUE 6. *The frequency of rounds, and the proposal to invite bids for all the strategic areas in the next round.*

ISSUE 7. *How the financial requirements for decommissioning can best be met in the interests of both the industry and the environment.*

ISSUE 8. *The proposal that companies should retain the sole right to develop in an area which they have investigated for a period of three years after the completion of the lease under which such investigation was carried out.*

ISSUE 9. *The proposal that the Agreement for Lease should specify a timetable for site investigation and the development lease a timetable for subsequent development, with break points in the absence of sufficient action.*

ISSUE 10. *The rules which would give the right amount of flexibility in the specification of the area for development in relation to the area which has been under investigation.*

ISSUE 11. *The proposals for information sharing and publication.*

ISSUE 12. *Whether separate provision will be needed for other offshore technologies, and if so on what timescale.*

Chapter 5: Potential impact of offshore development

ISSUE 13. *The value to developers and other stakeholders of the publication of guidance on acceptable levels of risk from offshore wind farms.*

Chapter 6: Strategic Environmental Assessment

ISSUE 14. *The Government's proposal with regard to the SEA.*

Chapter 7: The consents process

ISSUE 15. *The legislative changes suggested to extinguish public rights to navigation and possibly also fishing, and to create exclusion zones around wind farms.*

ISSUE 16. *The proposed clarification of the role of local planning authorities.*

ISSUE 17. *The proposal to further streamline the administration of the consents process by establishing one main point of contact for managing progress.*

Chapter 8: The provision and regulation of offshore infrastructure

ISSUE 18. *The conclusion that there should be no extension to the licences of the transmission and distribution companies.*

ISSUE 19.
(a) The extent to which general competition law can and should be relied on; and
(b) Whether a new regime should be established which requires cable owners to make available to the market any spare capacity, and if so, on what principles it should be based.

Chapter 9: Timetable

ISSUE 20. *The proposed processes and timetables for the next round and the strategic environmental assessment.*

ANNEX B

The Consultation Criteria

The Cabinet Office's Code of Practice on Written Consultation applies to consultation documents issued after 1 January 2000. The criteria are set out below and every effort has been made to ensure that they are followed in this consultation document.

1. Timing of consultation should be built into the planning process for a policy (including legislation) or service from the start, so that it has the best prospect of improving the proposals concerned, and so that sufficient time is left for it at each stage.

2. It should be clear who is being consulted, about what questions, in what timescale and for what purpose.

3. A consultation document should be as simple and concise as possible. It should include a summary, in two pages at most, of the main questions it seeks views on. It should make it as easy as possible for readers to respond, make contact or complain.

4. Documents should be made widely available, with the fullest use of electronic means (though not to the exclusion of others), and effectively drawn to the attention of all interested groups and individuals.

5. Sufficient time should be allowed for considered responses from all groups with an interest. Twelve weeks should be the standard minimum period for a consultation.

6. Responses should be carefully and open-mindedly analysed, and the results made widely available, with an account of the views expressed, and reasons for decisions finally taken.

7. Departments should monitor and evaluate consultations, designating a consultation coordinator who will ensure the lessons are disseminated.

The complete code is available on the Cabinet Office's web site, address http://www.cabinet-office.gov.ukservicefirst/index/consulation.htm

Comments or complaints

If you wish to comment on the conduct of this consultation or make a complaint about the way this consultation has been conducted, please write to:
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or e-mail Philip.Martin@dti.gsi.gov.uk.

Regulatory impact assessment

Introduction

This initial regulatory impact assessment covers the strategic framework outlined in the consultation document. Only some aspects of the framework require primary legislation and further regulatory impact assessments will be prepared on these aspects in due course to accompany the legislative proposals. Comments on this document to inform the full regulatory impact assessment would be welcome.

Objectives

The consultation document proposes a strategic framework for the future development of the offshore wind industry. The framework is intended to support the optimal development of the offshore wind industry consistent with a responsible approach to the marine environment and other marine users. Wind energy is expected to make a significant contribution to meeting the Government's target that 10% of electricity supplies will be generated from renewable sources by 2010. Wind energy generates electricity without emitting environmentally damaging greenhouse gases, thus contributing to meeting Kyoto targets. It also contributes to a diversification of national energy sources, thus helping to ensure that energy supplies are secure.

The framework will apply both in territorial waters, where a legislative and regulatory regime is already in place, and in a 200-mile Renewable Energy Production Zone. Legislation will be necessary to establish in this Zone a legislative and regulatory framework broadly similar to that which already applies in territorial waters.

The framework consists of two main elements both of which to be are informed by a strategic environmental assessment in accordance with European Directive 2001/42/EC (see Chapter 6). First a process is proposed for the allocation of development rights in three strategic areas, based on competitive bidding in a series of rounds. The objective of this process is to ensure that efficient use is made of the available marine resource. The other principal element is a process for consenting individual projects. The objective here is a process which supports a thorough evaluation of the impact of the development in as short a timescale as possible and which delivers consistent and transparent decisions in an efficient manner. The Government is committed to streamlining this regulatory process with the aim of minimising the burden on the developer, consistent with a rigorous evaluation of the project. An environmental impact assessment will be required for all projects.

THE SCALE OF THE ISSUE, WHO IS AFFECTED AND ISSUES OF EQUITY

The strategy will have an impact principally on the offshore wind energy industry. The offshore wind energy market is still in the process of establishing itself. As the investment required to take forward projects is substantial it is likely that large companies would be in the vanguard of development, although small companies may have a role to play as part of consortia. The scale of future development envisaged by the industry is not known precisely at this stage. The first round of development resulted in 20 developers bringing forward plans for wind farms with a total capacity of about 1.4GW of renewable energy. The British Wind Energy Association estimates that a further 3-4GW can realistically be built by 2010.

All the processes introduced as a result of this strategy will be fair and equitable and will be applied in a consistent manner to all wind farm developers. The competition to allocate development rights will be open to all developers and criteria on which the

successful bidders will be chosen will be published. The costs and benefits of developments will be assessed in an objective manner when development consent is sought.

Options

(i) Within a strategic framework

The preferred option is to put in place a framework for the allocation of development rights for wind farms based on competitive bidding in a series of rounds. This will extend to both territorial waters and beyond. Development consent will be required for the projects which emerge from this process. A framework of legislation is already in place to consent projects in territorial waters. The intention is to extend this legislative framework to cover developments beyond territorial waters.

The benefits of this approach are that the development of the wind farm industry takes place in a structured way. It encourages a pattern of development which allows optimal exploitation of the available resource. More particularly this approach enables a full assessment to be made at a strategic level, through a strategic environmental assessment, of the potential impacts of development on particular areas of the sea. This is particularly important as the potential impact of offshore wind development on the environment are not fully understood. A process which manages these risks is therefore important.

(ii) Development without a strategic framework

It would be possible to enable wind farm development to proceed without a strategic framework, so that developers were free to choose the best sites for development throughout coastal waters. This would follow the model of the first round of development. The benefit of this approach would be that developers would not be limited to locating their wind farms within strategic areas. A rolling programme of development would be an option so that developers could bring forward their projects when they were ready, rather than according to a fixed timetable.

The main disadvantage of this approach is that without a framework it would be difficult to assess the impact of wind farm developments on the environment at a strategic level. Whilst the European Directive on Strategic Environmental Assessment does not have to be transposed into national law before 2004 it makes sense to put in place a framework now which meets the requirements of the Directive, particularly as the impact of wind energy on the marine environment is not fully understood. An unstructured approach would also make it difficult to assess whether the available sea bed resource was being used in an optimal way. Furthermore, developers would be likely to find it more difficult to secure development consent for their projects because developments not seen to be taking place within a carefully considered framework which considered the best choices of areas for development and cumulative impacts would be much more likely to attract objections.

It is unlikely that the costs for the wind farm developer of bidding for site development rights within a strategic framework would be significantly different from the costs of preparing a bid within a less structured arrangement. The costs of preparing applications for development consent for individual projects would be the same under both options i) and ii).

(iii) A legislative framework beyond territorial waters

Most of the primary legislation proposed in the consultation document is needed to put in place a legislative framework beyond territorial waters which broadly mirrors the regime which applies in territorial waters. An option would be not to legislate for development beyond territorial waters. This would allow developers to locate their wind farms where they chose without the requirement to bid for the site. It would also enable developments to move forward rapidly without the need for planning consent from Government (except where legislation was already in place). Developers would be freed from the costs of bidding for sites and also from the costs associated with applying for consent from Government for individual projects.

This laissez faire approach has several disadvantages. Developers would not enjoy security over their development sites and the players with the most power could monopolise use of the resource and shut out other developers from entering the market. It would not be possible for Government to assess the full range of the impacts of the development on other marine users, nor to take a strategic approach to protection the environment. The UK would also be in breach of international obligations, including the European Directive on Strategic Environmental Assessment.

Compliance

Compliance will be built into the proposals for legislation.

Competition assessment

It is not anticipated that the proposed strategy will have a detrimental effect on competition. The offshore wind industry does not yet represent a mature market. The proposed framework is not likely to affect market structure nor impede entry into the market. It is expected that the proposals outlined in the strategy will have broadly the same cost impact on firms and new entrants are not likely to face higher costs than current developers. Whilst the market is subject to technological change it is not considered that the strategy will impede such development. The proposal to focus development in strategic regions will restrict the ability of firms to choose the location of their projects to a certain degree, but this applies equally to all participants.

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