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JOINT NATURE CONSERVATION COMMITTEE

MARINE RENEWABLE ENERGY SOURCES

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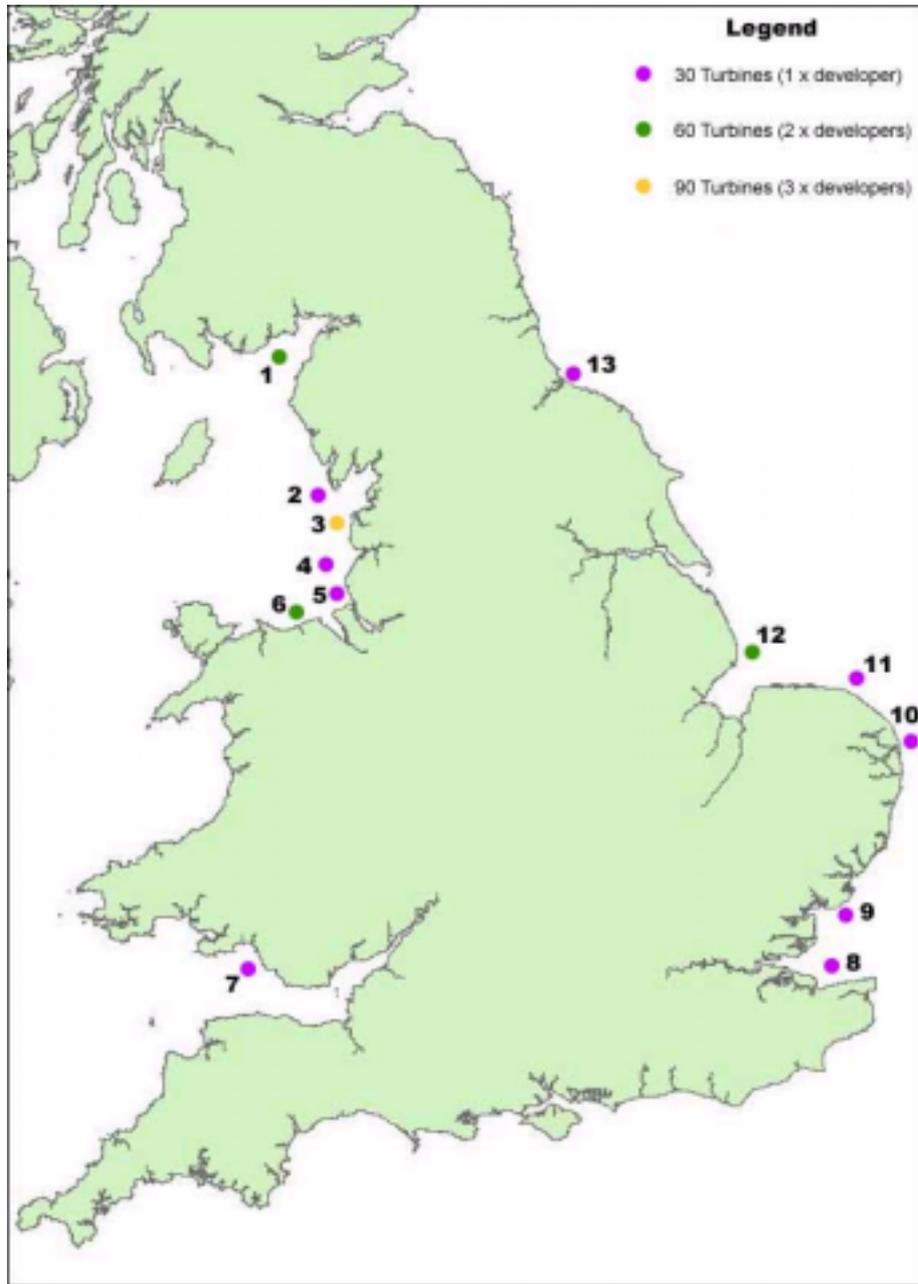
1. Introduction

- 1.1 Renewable energy is an essential element of the Government's Climate Change Programme. The Government has set a target for the UK that 10% of its energy production should come from renewable sources by 2010, rising from the current 3%. In Scotland, the target for energy production from renewable sources set by the Scottish Executive is 18% by 2010. Renewable energy sources include wind, wave, tidal, hydro-electric, energy from waste, landfill gas, energy crops, agricultural and forestry residues, fuel cells, solar heating and photovoltaics. Of these, wind, wave and tidal power production will affect the marine environment. The Government's proposals should create a market for renewables worth £1 billion in 2010.
- 1.2 JNCC Support Unit and country agency staff have been advising on oil and gas production and other marine industry activities for many years. The usual split of such advice is that the country agencies deal with issues within the 12NM territorial water limit, while JNCC covers issues further offshore. All staff work together through the Marine Industries Working Group to ensure coherence of advice.
- 1.3 This paper summarises the development of marine renewable energy production to date and outlines nature conservation issues and approaches.

2. Wind energy

- 2.1 Marine wind farms, furthest advanced in terms of technology and feasibility, already exist in Denmark and elsewhere. Such farms are not much more than a positioning in the sea of technology developed for land-based farms. The advantage of marine over land, in renewable energy terms, that a marine location provides is a more stable wind supply and, therefore, an ability to install larger turbines.
- 2.2 The Crown Estate owns and licenses the majority of the UK seabed inside territorial limits, whilst the DTI has regulatory functions further offshore. The first wind turbines installed in the marine environment in the UK are off Blyth, Northumberland, where two turbines are a marine extension of a landward series.

2.3 The Crown Estate announced a round of licensing for wind energy sites in territorial waters in 2000, and under this first round licensed 16 developments at 13 sites in late 2001 (see map). The round limited the area of seabed licensed to 10 km², a maximum of 30 turbines and a minimum installed capacity of 20MW. One site has also been licensed off Northern Ireland. Two windfarm projects, one in Wales and one in England have been consented and capital grants received from the DTI.



Sites

- | | | |
|----------------------|------------------|-----------------------------|
| 1. Solway Firth | 2. Barrow | 3. Shell Flat |
| 4. Southport | 5. Burbo | 6. North Hoyle & Ryll Flats |
| 7. Scarweather Sands | 8. Kentish Flats | 9. Gunfleet Sands |
| 10. Scroby Sands | 11. Cromer | 12. Lynn & Inner Dowsing |
| 13. Teesside | | |

- 2.4 The Crown Estate will grant a lease only when the developer has obtained all the necessary statutory consents from the responsible Government Departments. An Offshore Renewable Consents Unit (ORCU) has been established by DTI to act as a one-stop shop for applications in order to make the process of gaining consents more streamlined. ORCU will be publishing a guidance note on the process for developers. The Transport and Works Act also applies where projects interfere with rights of navigation in the internal waters and up to the limits of territorial waters of England and Wales. In Scotland and Northern Ireland projects are likely to be subject to Private Bill procedures.
- 2.5 The first round sites were chosen by potential developers based on a range of relevant factors including water depth, wind resource and grid connection. Areas of high nature conservation value (based mostly on statutory designation) were avoided as well as areas of seabed where existing seabed activities and uses are potentially incompatible with offshore windfarm development. At the present stage of technological development water depth, grid connection and cable length are the major economic and technical considerations. Consequently all the proposed windfarm sites are in water depths of less than 20m, and no greater than 12 km offshore. With technological development, these factors are expected to be less limiting in future.
- 2.6 At present, the Electricity Act 1989 (Requirement of consent for offshore wind and water driven generating stations) (England and Wales) Order 2001 legislates for Environmental Impact Assessments (EIAs) for all projects producing over 1 MW of electricity. This act does not apply in Scotland/Northern Ireland. To date developers have conducted a range of environmental investigations and monitoring studies. A variety of contractors have carried out these studies, not necessarily using the best or most consistent techniques.
- 2.7 The country agencies have also initiated studies. For example, the Countryside Council for Wales (CCW) has commissioned a study of the distribution of common scoter around Wales and in Liverpool Bay. A study has also been undertaken on behalf of CCW on 'Development of a methodology for the assessment of cumulative effects of marine activities using Liverpool Bay as a case study'. The Crown Estate and relevant developers are contributing financially to these studies.
- 2.8 Further environmental studies are being undertaken using funds from a trust fund established by the Crown Estate. Studies are selected and managed by a steering group drawn from the offshore wind industry and conservation bodies, including JNCC, CCW and English Nature. Studies selected so far include the effects of electromagnetic fields around cables, the potential effects on seaduck feeding areas and standard methods for future seabird studies.
- 2.9 The country agencies and the Support Unit have both supplied data and

information for the first round of EIAs.

- 2.10 The first EIAs have been submitted and are being assessed by the country agencies. Objections have been raised on proposed windfarms in both Scotland and Wales.
- 2.11 JNCC Support Unit staff have been working with colleagues in Europe on common issues, particularly in relation to effects on birds.
- 2.12 English Nature has produced in draft a paper entitled 'English Nature and Renewable Energy'. This covers both terrestrial and marine renewables. CCW has produced a wind turbine policy covering both terrestrial and marine windfarms. This was first produced in 1992 and was updated in 1999. CCW also has two checklists; a checklist for wind turbine development proposals and a checklist for planning controls and conditions on wind turbines. Although these are for terrestrial sites, CCW has been providing developers with similar checklists for marine windfarms. CCW has also produced 'A guide to best practice on seascape assessment'. Scottish Natural Heritage (SNH) have recently commissioned a report entitled 'Identification of possible marine renewable energy development projects and a review of possible natural heritage impacts in the areas concerned'.
- 2.13 The first round of licensing was largely based on the wishes of individual developers. Such a process could not take a strategic view of the UK's waters – DTI and Crown Estate have consequently agreed to follow the example of their colleagues dealing with oil and gas and will be undertaking Strategic Environmental Assessment (SEA) ahead of each round of future licensing. JNCC represents the conservation agencies on the SEA steering group, drawing on several years of experience with oil and gas SEA.

3. **Other marine renewable energy sources**

- 3.1 Wave energy devices are still in the experimental and demonstration phase in the UK. A coastal device, the Limpet, is being used on Islay and several other offshore devices are also being developed and tested. Offshore wave devices exploit the more powerful wave regimes available in deep water. The best areas would therefore be off western Scotland. However distribution cabling is liable to be prohibitively expensive for an individual developer in this area. Government has consequently looked at the feasibility of installing a collector cable running for much of the length of the UK west coast.
- 3.2 Tidal energy can be tapped by using a hydroplane tidal stream generator, tidal impoundments, large barrages and underwater turbines. A prototype hydroplane, Stingray, was installed in Shetland during 2002. Proposals have been put forward in the past for large barrages but such schemes would plainly have serious environmental consequences. This is one of the main reasons for projects such as the Severn Estuary barrage project not proceeding. Two locations are being investigated in Wales as possible sites for tidal impoundments and there is an experimental suba turbine installed in Milford Haven with another proposed off North Devon.

4. **The future**

- 4.1 We expect a series of future licensing rounds, with associated environmental impact processes. Windfarms will move into deeper water, and may start exploiting oil industry infrastructure, especially as it is decommissioned as hydrocarbons become exhausted. There is already a preliminary proposal to use existing oil and gas infrastructure in the Moray Firth to install an industrial size windfarm (120 turbines). Other technologies may move into a more commercial phase.

- 4.2 At first, a relatively local approach was taken to marine renewable energy development however there is now a developing strategic framework in place. Country agency and Support Unit staff will work together through the marine industries working group to establish standards and ensure full consideration is given to environmental perspectives. We will also need to co-ordinate with the implementation of the Natura Directives in the marine environment.