

British Wind Energy Association  
Path to Power  
Wave and Tidal Stream Energy around the  
United Kingdom  
Legal and Regulatory Requirements

November 2005

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# Path to Power – Wave and Tidal Stream Energy around the UK – Where, When and How

## Executive Summary

- This report identifies a growth scenario for the emerging UK wave and tidal energy industries up to 2011 and considers issues for consenting and site location
- Different prototype technologies are currently being developed or installed, but leading developers now wish to plan for larger arrays of devices
- A realistic deployment scenario is for up to 9 Prototypes and 6 Small Arrays to be ready to progress by 2008, and for 60 MW of large wave arrays and 45MW of large tidal arrays to be in the water by 2011 if the technology succeeds, continuing financial support is available, and consents are granted
- This programme cannot however be met without greater clarity on
  - Acceptable areas of wave and tidal resource for development (through the SEA process)
  - The requirements for project specific EIA
  - An established procedure for site selection
- Urgent action is needed to:-
  - Set Government policy on the approach to SEA, interaction with EIA, and site allocation
  - Identify a clear programme of generic research on impacts on the environment
  - Identify a single body to coordinate the research and disseminate its results
  - Ensure that existing stakeholder liaison groups for offshore wind embrace wave and tidal energy
  - Identify the objectives scoping and geographical scope of an initial SEA programme
  - Set a standard for environmental monitoring for individual devices
  - Produce guidelines for EIA of Large Arrays

## 1 The Study

1.1 This report has been prepared for the British Wind Energy Association to identify a growth scenario for the emerging UK wave and tidal energy industries and consider issues for consenting and offshore site allocation. We have completed over 30 interviews during the past two months with Government, wave and tidal device developers, project developers, and environmental stakeholders.

1.2 An Advisory Panel was formed to review and critique the work of the study. This group comprised:-

Alan Moore	-	BWEA Marine Steering Group Chairman
Michael Hay	-	BWEA Marine Renewables Development Manager
Graham Sinden	-	Environmental Change Institute, University of Oxford

Nick Mabey	-	Number 10 Strategy Unit, Senior Advisor
John Callaghan	-	Marine Energy Challenge Programme Manager, Carbon Trust
Sue Reid	-	Senior Consultant, Entec
Carolyn Heeps	-	Head of Research and Environment, The Crown Estate
Jon Boston	-	Marine Renewables Development Manager, npower renewables

## **2 The UK Wave and Tidal Resource**

- 2.1 An increase in the level of renewable energy is an important element in Government's policies for combating climate change. Wind, wave and tidal energy resources in the UK have the potential to contribute significantly to UK electricity demand, as well as reducing reliance on foreign imports and increasing the diversity of energy mix at a time when the UK will become increasingly dependent on imported energy.
- 2.2 Research for the DTI has produced the UK Marine Renewable Energy Atlas, mapping the wave, tidal stream and offshore wind resource potential within the limits of the UK Continental Shelf. It is planned to use this to assist decisions on future rounds of licensing for large scale deployment of marine renewable technologies. The work is being undertaken as part of the DTI led Strategic Environmental Assessment (SEA) combined programme covering oil and gas and offshore wind.

## **3 Wave and Tidal Stream Devices**

- 3.1 Most marine renewable technologies are not cost competitive with conventional fossil fuel generation, and will require investment and support. But current development activities will result in cost reductions over the long term, and many renewable technologies are expected to become cost competitive with fossil fuels over the next 10 to 20 years. This will arise through cost reductions for renewables, particularly with the recent significant rise in fossil fuel prices, and policies such as the Climate Change Levy and EU Emissions Trading Scheme.
- 3.2 Marine renewable energy is an emerging market. A range of different prototype technologies is currently being developed or installed. Some have progressed as far as full scale deployment and testing, and several UK based companies are presently actively involved in constructing devices, supported by various financial means, including Government and private investors. Examples of renewable energy devices can be seen on <http://www.bwea.com/marine/devices.html>.
- 3.3 Marine renewable energy devices will generally be tested in the sea as a prototype single device, covering survivability, reliability and performance, and, if possible, certification and environmental information. Once proven in the sea, the next stage is likely to be a small array of devices during which the technical and commercial viability can be demonstrated and interaction between devices assessed. Once viability is proven and interaction between devices understood, deployment of larger arrays becomes a possibility before significant projects are developed.
- 3.4 Test facilities are installed at the European Marine Energy Centre (EMEC) off the Orkney Islands (a test bed for developers of full scale marine energy technologies), and at NaREC in Northumberland (a centre for testing smaller scale prototype devices). EMEC is developing a tidal site to accommodate at least three prospective tidal device developers. A "Wave Hub" is also planned off the south west coast of England for testing up to four different wave devices in arrays to complement a national programme of industrial development and assist the learning process for developers.

3.5 To tackle the key development issues, reduce uncertainty and verify the concepts, leading developers now wish to progress to larger arrays of devices, prior to deployment on a large scale.

3.6 For the purposes of this report the following terms are used: -

Prototypes	-	Single devices up to c.1 MW
Small Arrays	-	A small array of devices up to c.5 MW
Large Arrays	-	Larger arrays of devices up to c.30 MW
Significant Projects	-	Wave or Tidal farms in excess of 30 MW

#### **4 Consent Requirements**

4.1 Certain key consents, similar to those for offshore wind, will be required for wave and tidal projects, although these will vary as between England and Wales, Scotland and Northern Ireland. The overall position can be summarised as follows: -

<b>Electricity Act 1989 Section 36</b>	For offshore generating stations over 1MW capacity within territorial waters adjacent to England Wales and Scotland and in the Renewable Energy Zone now designated outside territorial waters under the Energy Act 2004. There are equivalent provisions for Northern Ireland.
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<b>Food and Environment Protection Act 1985 (FEPA) Section 5</b>	For depositing articles or materials in the sea/tidal waters below mean high water springs around England and Wales Scotland and Northern Ireland
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<b>Coast Protection Act 1949 (CPA) Section 34</b>	Construction of works under or over the seashore lying below the level of MHWS around England and Wales and Scotland but not Northern Ireland
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<b>Town and Country Planning Act 1990 (TCPA) Section 90</b>	Planning consent for certain onshore elements of an offshore project in England and Wales with equivalent provisions in Scotland and Northern Ireland
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<b>Transport and Works Act 1992 (TWA)</b>	An alternative route (with FEPA 1985) to obtain certain statutory rights necessary for development of offshore projects in England and Wales, displacing the need for EA 1989 and CPA 1949 consents. TWA 1992 does not extend to Scotland or Northern Ireland.
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4.2 As with offshore wind, two EC Directives will also play a key role in the grant of consents for wave and tidal projects.

4.3 The EIA Directive (85/337/EEC as amended) requires that an environmental impact assessment (EIA) is carried out in support of an application for development consent for certain types of major projects listed in Annex 1 and for other projects listed in Annex 2 where they are likely to give rise to significant effects.

4.4 The EIA Directive has been transposed into UK law for electricity works by the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2000 and the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000. There is no equivalent provision in Northern Ireland requiring EIA for generating stations which require a Section 36 consent

- 4.5 The Directive has not yet been directly applied in the UK for FEPA 1985 (although Regulations are in preparation), but Section 8(5) provides for the Licensing Authority to require the applicant to supply sufficient supporting information to enable the licensing authority to determine the application
- 4.6 The practical effect of EIA is that any application for a wave or tidal energy project is likely to be accompanied by an Environmental Statement which identifies the likely significant effects of the array or farm on the environment, and proposes suitable mitigation measures.
- 4.7 The SEA Directive (2001/42/EC) came into force on 21 July 2001 and was implemented in UK law by the Environmental Assessment of Plans and Programmes Regulations 2004. Its purpose is to ensure that the likely significant environmental effects of certain plans and programmes are identified and taken into account during their preparation and prior to adoption. It extends EIA principles to strategic level decision making.
- 4.8 Where 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 Member States). The environment authority must then be given an "early and effective opportunity" to comment on the draft plan or programme and accompanying report.
- 4.9 Any plan or programme for wider scale deployment of tidal or wave projects will require SEA before it can be adopted. It is far from clear what constitutes a plan or programme for the purposes of the SEA Regulations or what level of detail is required to enable strategic environmental effects to be assessed. This issue is particularly important in the case of wave or tidal where there has so far been limited monitoring of the environmental effects of Prototypes in the water
- 4.10 Significant environmental effects resulting from the implementation of plans and programmes must be monitored to identify any unforeseen adverse effects and to enable appropriate remedial action to be taken. Monitoring allows the actual effects of the plan to be tested against those predicted in the SEA and helps to ensure that problems which arise during implementation, whether or not they were foreseen, can be identified and future predictions made more accurately. It can also be used to provide baseline information for future plans or programmes.

An outline sequence for obtaining consent for a Large Array, where preceded by a single Prototype and/or Small Array would therefore be:-

- Scoping of EIA for Prototype/Small Array
- EIA for Prototype/Small Array (EIA to be proportionate to the scale of project)
- Grant of Section 36 consent/FEPA licence for Prototype/Small Array
- Continue dialogue with key stakeholders
- Monitor environmental impacts (generic and device specific)
- Contribute to research work on generic impacts
- SEA of selected areas of Large Arrays/Significant Projects
- Select location for Large Array (informed by SEA and stakeholder dialogue)
- Scoping of EIA for Large Array (informed by EIA Guidance)

- EIA for Large Array (informed by generic research and device specific monitoring)
- Grant of Section 36 consent/FEPA licence for Large Array

4.11 The DTI consultation document "Future Offshore" (2002) outlined a strategic approach to site leasing for commercial scale offshore renewables development, proposing that future rounds for offshore wind be limited to defined areas of sea, and that these should only be offered after SEA. It was anticipated that in future there might be separate rounds for other marine renewables technologies such as tidal stream and wave power when they reached the point of commercial scale deployment. Requests for demonstrator sites would be considered on their merits. DTI have very recently produced Guidance on Consenting Arrangements in England and Wales for a Pre-Commercial Demonstration Phase for wave and Tidal Stream Energy Devices (Marine Renewables).

## 5 The Marine Renewables Deployment Fund

5.1 On 2 August 2004 Government announced a £50 million Marine Renewables Deployment Fund, primarily focussed on supporting developers through the early stages of the "funding gap" between early R&D of Prototypes and Small Arrays and revenue generating Significant Projects. Key features of the scheme are:

- Total amount allocated: £42 million
- Capital Grant available for technology projects: 25% (limited to £5 million)
- Revenue Support Payment: £100/MWh, ROCs, electricity for 7 years from commissioning
- Maximum funding for any one technology/project: £9 million
- Scheme to be open for 3 years
- Project support: 2 years for commissioning and 7 years for operation

5.2 The £9 million limit on funding for any one technology/project is likely to restrict the size of projects supported by the Fund. For larger projects, long term market based mechanisms will be required.

## 6 Deployment Scenarios – Prototypes and Small Arrays

6.1 From discussion with project and device developers on their plans for getting Prototypes and Small Arrays in the water over the next three years, current indications are that there are four possible methods of deployment

- (i) Deep and shallow water wave Prototypes and deep water and shallow water tidal Prototypes will be deployed at EMEC
- (ii) Deep water wave Prototypes and Small Arrays will be deployed at Wave Hub, if that project is approved.
- (iii) Single wave and tidal Prototypes will be deployed elsewhere (such as Pembrokeshire or Northern Ireland)
- (iv) Wave and tidal Small Arrays will be deployed elsewhere, if approved, following Prototype testing.

6.2 A scenario up to 2008 for developing Prototypes and having Small Arrays ready to be deployed, is:-

Prototypes

	2005	2006	2007	2008
Tidal stream	1	2	1	
Wave	1	3	1	

Small Arrays

	2005	2006	2007	2008
Tidal stream			1	1
Wave		1	2	1

6.3 We have also discussed with project developers their plans for deployment of Large Arrays of up to 30 MW, if the technologies prove successful. Methods of deployment will be

- (i) Increase of Small Arrays to Large Arrays on or around the same site
- (ii) Move from a hub facility (such as EMEC or Wave Hub) to a new site to install a Large Array

6.4 Critical to developers' plans will be a clear route map on consenting for those sites which are practicable, taking account of such factors as grid connection, accessibility and other constraints. Project developers wish to plan ahead now, and believe that without a clear path forward beyond the initial demonstration phase, there is a real risk of the technology base moving outside the UK.

6.5 Assuming the technology succeeds and there is necessary financial support and grant of consents, a cumulative development scenario for Prototypes, Small Arrays and Large Arrays up to 2011 is set out below.

<b>Date</b>	<b>Wave</b>	<b>Tidal</b>
2005	1 MW Single Prototypes	1 MW Single Prototypes
2006	7 MW Single Prototypes Small Array	2 MW Single Prototypes
2007	12 MW Single Prototypes Small Arrays	7 MW Single Prototypes Small Arrays
2008	15 MW Small Arrays	10 MW Small Arrays
2009	20 MW Small Arrays	15 MW Small Arrays

2010	40 MW Small Arrays Large Array	30 MW Small Arrays Large Array
2011	60 MW Large Arrays	45 MW Large Arrays
2012	120 MW + Large Arrays Significant Project	100 MW + Large Arrays Significant Project

6.6 For this projected scale of development to succeed, greater clarity will be needed in a number of areas: -

- By 2007, generic research sufficient to inform the SEA process will need to be complete
- By 2008 those developers planning Small Arrays which will expand on site to Larger Arrays (i.e. Small Arrays not at hubs) will need to know, through the SEA process, what initial areas of wave or tidal resource to consider
- By 2008 those developers planning Large Arrays will need to know what requirements they have to meet for project specific EIA
- By 2009 an established procedure for site selection will need to be in place

*"The picture on permitting is confused. The Scottish Executive are pressing ahead on SEA. DTI have no such timetable. DEFRA are pushing Marine Spatial Planning. There doesn't seem to be a coherent strategy. We need a clear transparent timetable for what happens after demonstration stage. Technology developers are working at a faster pace and won't hang around". - Technology Developer*

*"We need a route map to get to 25 MW farms. It doesn't exist at present so we're looking at the Scottish Executive proposals instead." – Project Developer*

## 7 Location

7.1 For deep water wave, key areas of interest from industry are those of high wave power (> 30kw/m) off Orkney, Shetland, the western seaboard of Scotland, South Wales (Pembrokeshire) and the north coast of Devon/Cornwall (see Map 1). The majority of devices are likely to require at least 50m water depth. Early projects will be nearshore; certainly within 12 nautical miles and probably within 6. Potential areas of interest for shallow water wave energy (25-40 m water depth) are shown on Map 2.

7.2 For deep water tidal, (more than 30 m water depth) key areas of interest are as indicated on the DTI Marine Atlas, particularly Pentland Firth and Orkney, Kintyre and Islay, St Georges Channel, Anglesey, Pembrokeshire and Bristol Channel, the English Channel south of Hampshire/Dorset, and the Channel Islands. Early projects will be within 9 nautical miles of shore and probably within 3. Areas of interest for deep and shallow water tidal stream are shown on Maps 3 and 4 respectively. Within those areas, further study will be required to find suitable locations which allow construction/installation and suitable swell conditions, water depths, seabed conditions and tidal flows.

7.3 Many tidal project developers may wish to expand on the site of Prototypes and Small Arrays for the simple reason that the costs of consenting and study of the area will already have been incurred and it will not be economically feasible to relocate to a new site. This will have impacts on both the consenting process and on site licensing.

- 7.4 As Prototypes are developed, developers need in turn to plan Small Arrays and Large Arrays which can then proceed should the technology prove successful. In their view this cannot be done without very clear direction from the SEA process as to which areas will generally be acceptable and which will not. The SEA process on selected zones should therefore begin early, informed as necessary by monitoring data from prototype testing but, if necessary, allowing for further monitoring of Small Arrays to take place in open sea conditions. If the start of the SEA process is delayed, they take the view that the path to Large Arrays and Significant Projects in the UK could be slowed or halted altogether.

*"We want to be planning larger sites now in parallel with small scale testing. But we can't even start to do so until SEA is complete." - Technology Developer*

*"There will not be large numbers of projects coming forward, so pre-consenting of areas for development is not an option. Developers must be able to come forward with proposals within the overall SEA framework." – Device Developer*

## **8 SEA**

- 8.1 The key questions to be addressed for the SEA process are:-

8.1.1 Which areas it should cover as an initial phase, bearing in mind the state of technology development which could operate in those areas and the practicality of access and grid connection

8.1.2 What level of knowledge about specific devices is required before the SEA process can begin, and how much detail is required in the assessment

- 8.2 ODPM Guidance on SEA makes clear how much detail is required in the SEA process.

*"An SEA need not be done in any more detail, or using any more resources than is useful for its purpose. The Directive requires consideration of the significant environmental effects of the plan or programme and of reasonable alternatives that take into account the objectives and the geographical scope of the plan or programme ...*

*Article B of the Directive lists factors to be considered in deciding what information to include in the Environmental Report.*

- *Information that may reasonably be required taking into account current knowledge and methods of assessment*
- *The contents and level of detail of the plan or programme*
- *The objectives and geographical scope of the plan or programme*
- *The stage reached in the decision making process; and*
- *The extent to which it would be more appropriate to assess certain matters elsewhere in the decision making process.*

*It is not usually appropriate in SEA, and is often impracticable to predict the effects of an individual project level proposal in the degree of detail that would normally be required for an EIA of a project. If however a plan or programme proposes a specific development or type of land use for a particular area or location, the Environmental Report should include information which can reasonably be provided on the likely significant effects of that proposal and alternatives to it. Where proposals need to be assessed more than once e.g. at different stages of a plan or programme, information from earlier assessments can be used subject to any updating or extra detail which may be necessary. This can help to avoid unnecessary duplication of assessment."*

- 8.3 On this basis the Scottish Executive has already decided to commission consultants to assess the potential impacts of a range of technologies which generate renewable

energy from waves and tides, focussing on the west coast of Scotland, Orkney and Shetland and the Pentland Firth. The study will include all relevant marine coastal and land based environmental issues, ranging from marine ecology to fisheries, archaeology and the coastal landscape.

- 8.4 The nature of the plan or programme to be assessed is likely to be described in terms of the Scottish Executive's Renewable Energy Policy, in particular the contribution over the coming years of electricity output from wave and tidal technologies. The Executive wishes to ensure that by 2010, 18% of electricity generated in Scotland should come from renewable sources rising to 40% by 2020. In terms of wave and tidal energy in particular, the Forum for Renewable Energy Development in Scotland (FREDS) has concluded that by 2020 1,300 megawatts of marine energy capacity could be installed in Scottish waters and that 10% of Scotland's electricity production could come from these sources.

*"SEA can be carried out now with 90% accuracy. We know where it needs to be done and not to start now is simply absurd. Scottish Executive clearly think so." - Technology Developer*

*"The sooner the modelling and generic studies for SEA can be done the better – even without projects in the water." - Project Developer*

- 8.5 The DTI's Guidance Note takes a different approach

"The undertaking of an SEA is already a requirement for all offshore commercial projects e.g. offshore windfarms. But at this stage, sufficient knowledge of marine renewable needs to be acquired in order to design a suitable SEA and there have been insufficient projects to date to provide the data required to test different scenarios under an SEA. Therefore an SEA would be unlikely to provide much helpful information as it will be very difficult to predict impacts of marine renewable technologies prior to their deployment for demonstration. Completion of any SEA will be a pre-condition to the start of any commercial phase and will be subject to full public consultation"

- 8.6 However once Government receives a strong message from industry that the pace of study and the SEA process need to be expedited to keep abreast of developments within the industry, it is likely to be open to further discussion. In our view, developments within the industry are such that expedition is now required. An early start can be made on a robust SEA of selected areas, informed as necessary by generic research. Monitoring will allow the effects of the plan to be tested against those predicted in the SEA.

*"If we're left with a time lag on SEA to 2007/8 we risk losing the projects elsewhere. We have orders already for Portugal" – Technology Developer*

## **9 Grid Connections**

- 9.1 Critical to the choice of wave and tidal stream locations for SEA will be the availability of grid connections. The size of project (installed capacity) which it is possible to install is strongly linked to grid capacity. Assuming first Prototypes are rated 250 KW to 1MW, first Small Arrays may have installed capacities between 2 MW and 5 MW. For offshore renewables projects of both Small Array and Large Array scale, major grid upgrades are too expensive to be economically viable, and existing capacity will be called upon.

- 9.2 Proving grounds such as Wave Hub and Large Arrays could have total installed capacities of 20 MW – 20 MW. The number of sites with existing capacity (i.e. needing no major upgrades) sufficient to connect 5 – 30 MW, and which have appropriate physical and access conditions, is limited. In Scotland the grid links to the north and west coast are currently limited or non-existent. If larger commercial projects are to become feasible, (either individually or in groups) significant grid upgrades or new connections will be required.

## **10 EIA**

- 10.1 There is also concern within the industry that the process of project EIA will be slowed, and the cost increased, if certain generic impacts from wave energy and tidal stream on the environment and on users of the sea have not been studied and remain unclear.
- 10.2 Most wave energy devices will either be semi or fully submerged, meaning that moving parts, structures and mooring devices will all be in contact with the water column. Energy will be removed directly from the water body near the device, with impacts on surrounding habitats and species, and changes in hydrography. Impacts from the physical presence of device arrays will be similar to offshore wind, including effects on recreational users of the sea, the fishing industry, seascape and navigation, and they may have an impact on the use of the sea by some birds and other marine life. Individual technologies will have impacts which are specific to their mode of operation, such as noise emissions.
- 10.3 Tidal stream locations are by definition high energy, and may be environmentally sensitive, possibly including areas protected under European Law. As with offshore wave, tidal stream devices have the potential to extract significant amounts of energy which could affect sedimentation patterns and ecosystems throughout the length of the tidal stream. There is the potential risk of underwater collision with mammals and diving birds, and noise emissions could affect fish and mammals.

*“EMEC is crucial for collecting and pooling data and providing this to environmental stakeholders – NGO’s support this approach” – Technology Developer*

- 10.4 Key environmental stakeholders take the view that, while they support the offshore marine renewables industry in principle, the choice of site will be fundamental, and collaborative work is needed now on Prototypes and Small Arrays to assemble environmental impact monitoring data and gain a further understanding of certain key interactions with the environment. These interactions include:
- 10.4.1 Removal of energy from the marine environment and its biological implications (some initial work is planned by CCW and Crown Estate to be undertaken 2005/6)
- 10.4.2 Underwater noise from installation of generation units and on marine mammals and fish during operation (COWRIE Subacoustic Project relates only to wind)
- 10.4.3 Potential collisions between marine species (diving birds, marine mammals, basking shark) and wave and tidal generation devices.
- 10.5 Clearly developers will need to carry out site or device specific work for the purpose of project EIA. However they do not wish to be exposed to the costs and delays inherent in carrying out work of a generic nature which is common to all wave or tidal devices

## **11 Consents Process**

- 11.1 At present there is uncertainty in the industry on how the consenting process will operate, particularly beyond deployment of Small Arrays. Much greater certainty is thought to be essential to build confidence in the sector from investors. In particular the level of detail required for EIA, resolution of unknown issues arising from new technology, and the link with the SEA process, are seen as critical to mapping out a way forward for the industry.
- 11.2 A number of issues on environmental impact have already been studied as part of the offshore wind consenting process, including navigational risk assessment, commercial fisheries, coastal processes and noise impacts. However other issues are thought to require further study by virtue of the nature of the technology, as outlined above. A clear standard is needed for environmental monitoring of Prototypes and Small Arrays together with an agreed approach to assembling the results of further

research, publicity for research results, and what is needed to inform the EIA process.

- 11.3 Industry also takes the view that, in order to limit the cost of EIA work, draft guidelines should be produced (as with offshore wind) to ensure a common approach to EIA of larger scale projects, and on such matters as the need to scale up environmental impact observations from Prototypes and Small Arrays in the assessment of Large Arrays.
- 11.4 A number of marine renewables and stakeholder liaison groups already exist (on fishing, navigation and offshore environmental issues). These could be used to address generic wave and tidal stream, as well as wind, issues, on such matters as lighting deflectors and safety zones, shipping lanes and access to ports and displacement of fishing grounds.

## **12 Site Leasing**

- 12.1 For demonstration projects the Crown Estate has made it clear that when considering leasing applications it will adopt the following criteria: -

- 12.1.1 A detailed programme of work
- 12.1.2 Funding arrangements
- 12.1.3 A business plan, and
- 12.1.4 Assurance of removal and clean up.

It is thought that the DTI process for grant assessment can probably be adapted for assessment of lease applications, whether or not grant is involved.

- 12.2 A straight exclusivity arrangement will be offered by the Crown Estate, with EA preparation permitted through temporary consents, and entry to site when finances are secured. A lease will be offered, excluded from the Landlord and Tenant Act, and requiring: -

- 12.2.1 No adjacent development to be permitted (dependent on site size)
- 12.2.2 An attached Business Development Plan, including satisfactory financial provision
- 12.2.3 Data provision requirements

- 12.3 Length of lease is currently proposed at 7 years, with no extension (need to rebid) to take account of the nature of the R&D phase and the need to put limits on it to measure success. Areas to be offered still need consideration, and the scale of development and risk assessment remain to be confirmed.

- 12.4 Device Developers and Project Developers have repeatedly made the point that from their perspective and from that of their funders, a seven year lease for even a Small Array with no clear statement of the basis on which it will be renewed (e.g. technology performance, environmental impact and efficiency) will be inadequate to provide site security and funding for projects which will wish to expand on site should the technology allow it.

*“We can’t make projects economic over less than 15 years and would therefore need a 20 year lease. Flexible boundaries are needed to be able to continue on site if things are going right” – Project Developer*

*“For bankable leasing terms security of tenure is essential. The lease must be at least seven years to tie in with the grant period and extendable subject to good behaviour for the project to be economic, and keep running to feed into other projects” – Project Developer*

- 12.5 However until a clear approach on the way forward emerges from Government the Crown Estate are unable to develop a policy which goes beyond the pragmatic case by case approach adopted at present.

### **13 Funding**

- 13.1 While it is clear that the Marine Deployment Fund is seen as a useful pump primer to early demonstrators and small arrays there is still seen to be a gulf between first arrays and commercially viable projects which will continue to require financial support and incentives until costs come down. Without that support on offer, project developers are likely to follow the market elsewhere in the world where best financial returns can be achieved.

*“We are looking at 50-100 MW projects. Anything less will not absorb the consenting and cable installation costs.” – Project Developer*

*“We need drive and leadership to make the programme work. £50 million is a drop in the bucket compared to nuclear decommissioning costs. Vision is what’s missing. Without it we’ll bemoan our failures in a few years time.” – Technology Developer*

### **14 Recommendations**

- 14.1 A number of recommendations arise from this study

### **15 Overall Policy**

- 15.1 Clear direction is needed from Government on the way forward beyond the demonstration phase of development, including the approach to SEA, the interaction between the SEA and EIA process and the process of making available sites for Significant Projects

#### **Liaison Groups**

- 15.2 The work of stakeholder liaison groups for the offshore wind industry should be adapted to embrace wave and tidal energy to ensure that key issues of concern to stakeholders can be identified and addressed at the earliest possible opportunity

#### **Research**

- 15.3 In order to inform the SEA process, a clear programme of generic research should be drawn up and agreed. It is not thought that this need be dependent on the results of device monitoring in the water, and, as indicated in the ODPM Guidance on SEA, it will not be practicable to predict the effects of individual project level proposals. For projects of 5 MW or more a fund similar to COWRIE for offshore wind could be established
- 15.4 The generic research programme should be coordinated, together with the dissemination of its results, by a single appointed body along similar lines to COWRIE for offshore wind. Although wind developers pay for COWRIE, significant costs should not be imposed on wave and tidal developers at early stages of development

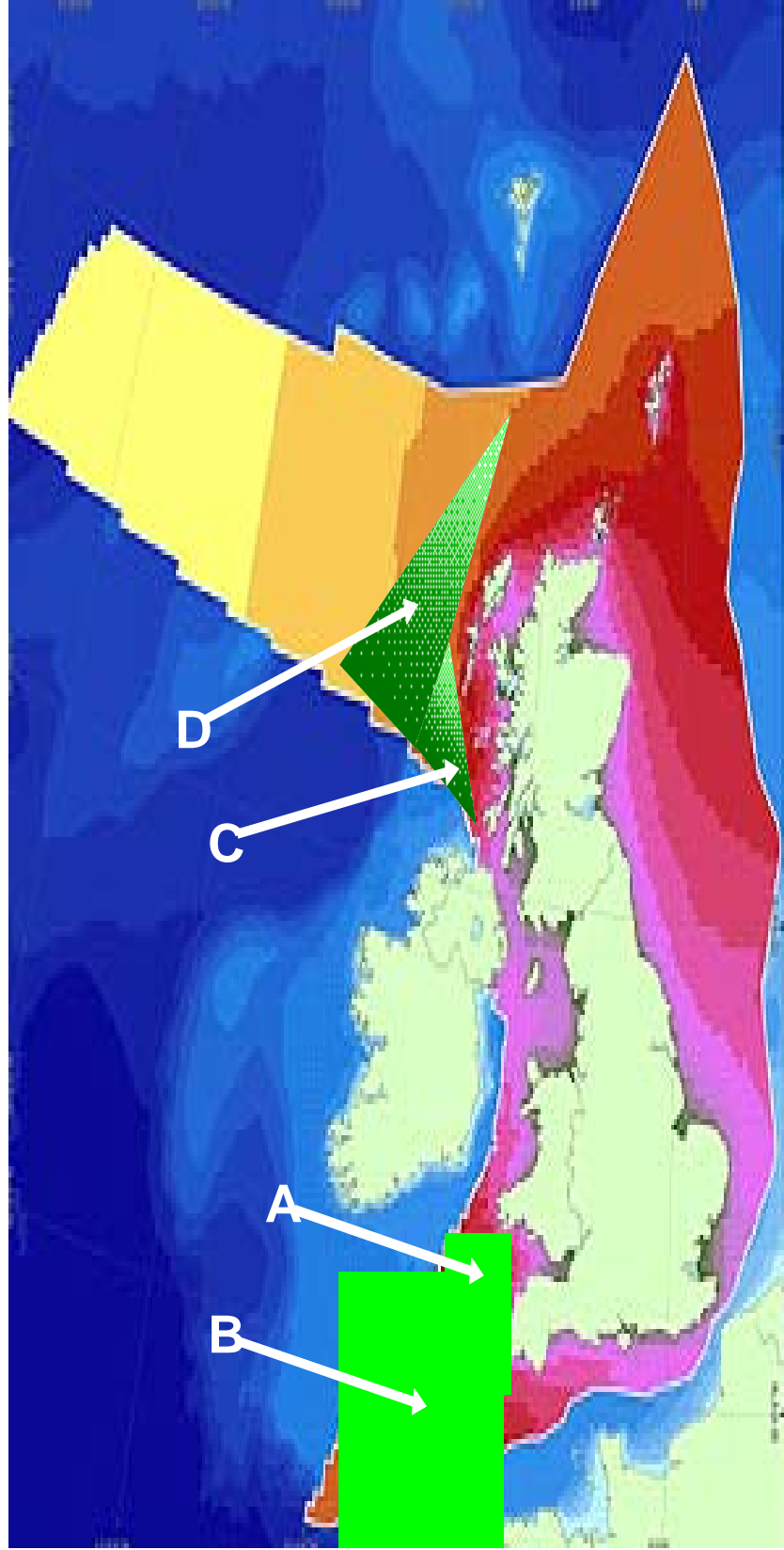
#### **SEA**

- 15.5 As soon as a full scale Prototype exists for a technology type (deep/shallow water wave/tidal), the objectives, scoping and geographical scope of the plan or programme for initial SEA should be identified together with those matters which it would be more appropriate to assess elsewhere in the decision making process (either SEA review or EIA)

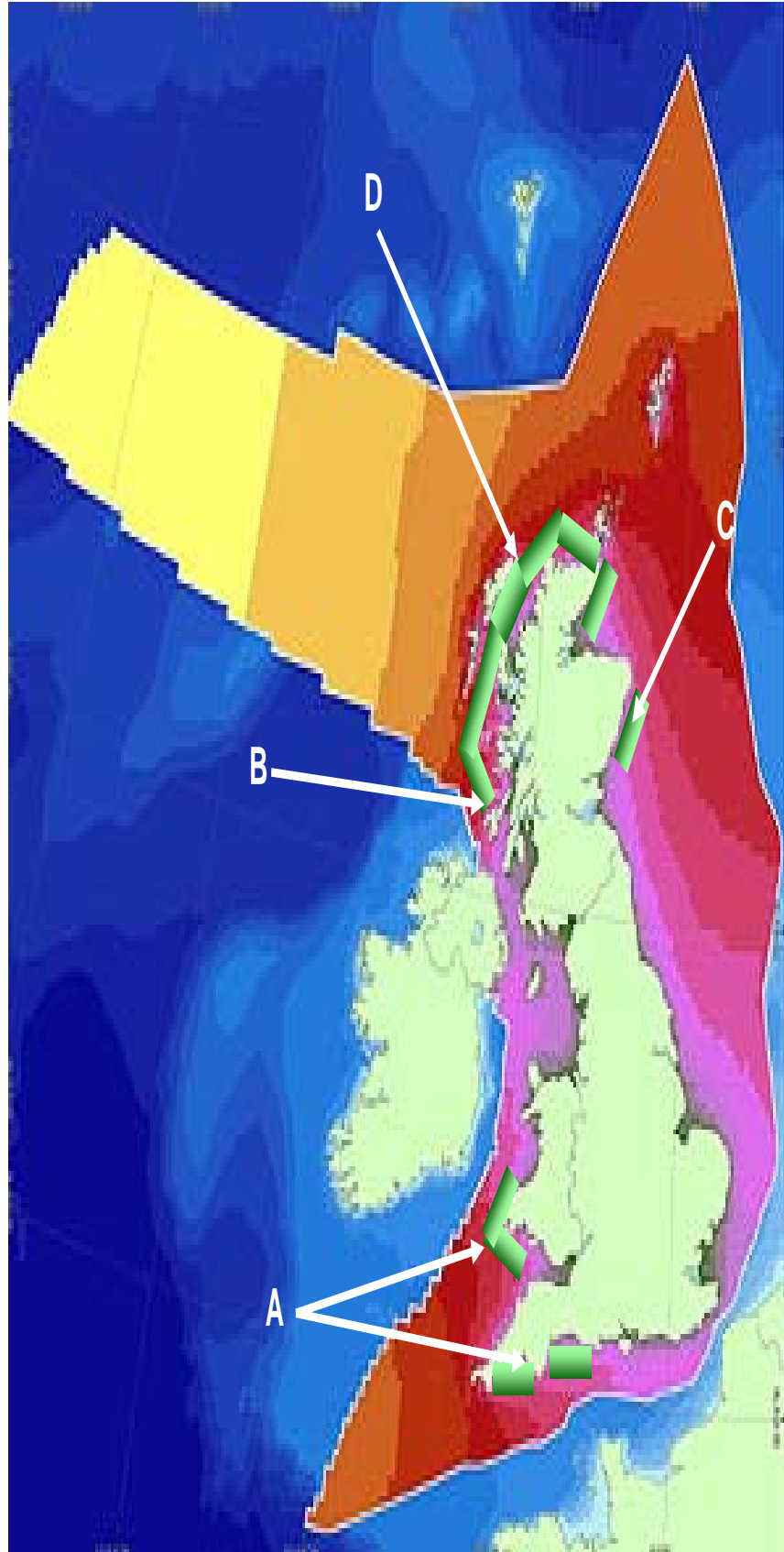
## **EIA**

- 15.6 A standard is needed now for environmental monitoring of individual devices while in the water to enable results to be collated and analysed on a common basis.
- 15.7 Draft Guidelines should be produced for EIA of Large Arrays to ensure a consistent approach and clear indication of what project specific studies will be required.

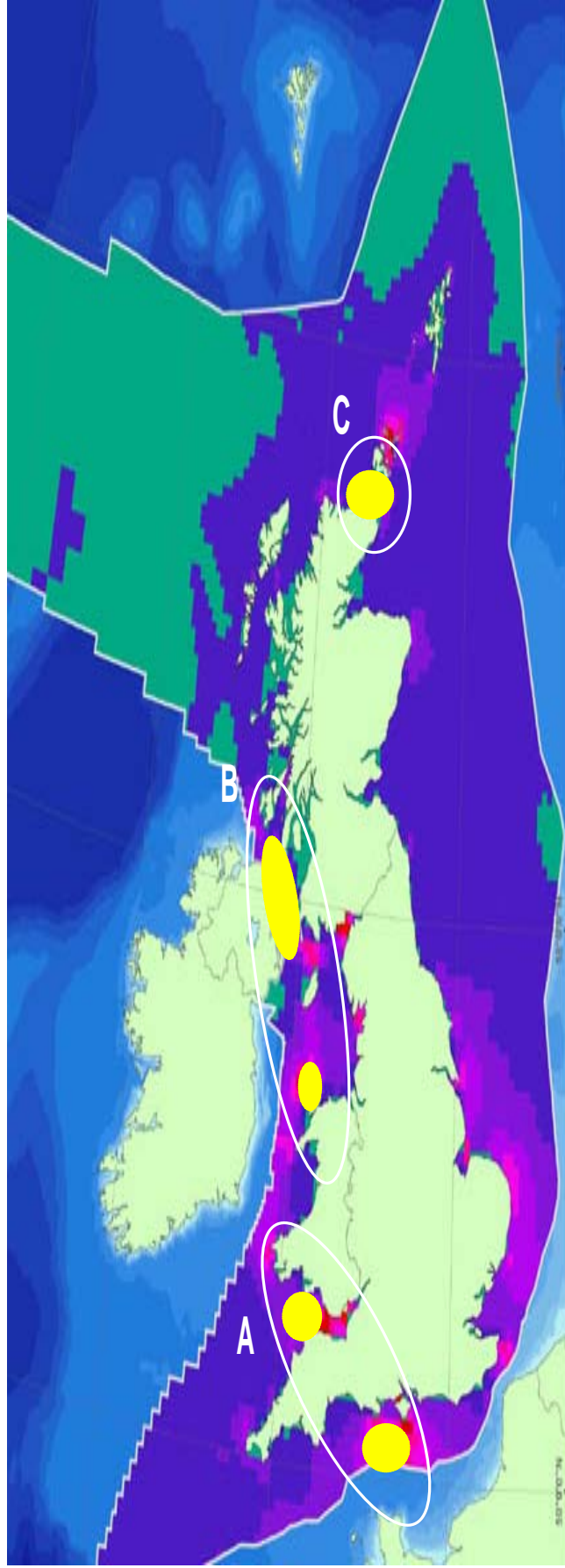
# Potential Deep Water Wave Areas A-D



# Potential Shallow Water Wave Areas A-D



# Potential Deep Water Tidal Areas A-C



# Potential Shallow Water Tidal Areas A-C

