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Habitats, birds, renewables and tidal power – energy *versus* species

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Balancing green against green

This article explores the issues that arise when proposals to exploit renewable energy come into conflict with the need to protect areas of ecological importance. The principles of sustainable development are strong on the need to balance social, economic and environmental factors but are difficult to apply when the balancing act has to be between different aspects of environmental protection. Yet this is precisely the issue that confronts society in deciding whether and where to site marine renewables projects.

The previous government stated[1] that marine energy is one of five priority areas for low carbon technologies and there are no indications that the new administration will think differently. The Scottish and Welsh administrations remain enthusiastic.

The development of marine renewable energy has the advantage of siting energy generation away from human settlements but the disadvantage of potential impacts on relatively pristine environments. The main regulatory tools for ensuring environmental safeguards are in place – strategic environmental assessment (SEA), environmental impact assessment (EIA) and appropriate assessment under the Habitats Directive – but how useful can these really be in helping decision-makers decide whether to go forward with a scheme?

The simple question, then, is whether we should allow the deterioration, or even total destruction, of marine habitats in order to realise the potential of marine renewable energy and thereby make real progress in reducing carbon emissions or whether we should continue to protect ecologically important marine sites and look elsewhere to meet our renewables targets. Unlike the question, the solution for the decision-maker is not going to be simple or straightforward. There are a number of underlying factors, social, economic and environmental, that may colour judgments, including:

- the physical geography of the UK which has resulted in it having enormous tidal ranges; if tidal energy projects are going to be a success anywhere, it will be the UK[2]
- the location of the UK in relation to the major ocean currents which means that its seas support a rich and varied patchwork of habitats, a fact that has resulted in the protective designation of large areas[3]
- the present state of development of maritime governance regimes; after years without any coherent legislation, we now have new marine statutes and commitments at the European level and new marine institutional arrangements[4]
- the strict protection measures in the Habitats Directive which have given considerable weight to the importance of safeguarding Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) or providing compensatory measures[5]
- the controversy over nuclear power generation which could supply a considerable proportion of electricity generation without CO_2 emissions[6]
- the change in government and the decision to abolish the Infrastructure Planning Commission (IPC).[7]

1 House of Commons Energy and Climate Change Committee 'Low Carbon Technologies in a Green Economy' Fourth Report Session 2009–10 HC 193-I para 66.

2 It has been estimated that the UK has the largest wave and tidal resources in Europe; see *Postnote* January 2009 No 324, available at http://www.parliament.uk/parliamentary_offices/post/pubs2009.cfm.

3 At the moment, these consist almost entirely of international and European designations, notably Special Areas of Conservation (SACs) under the Habitats Directive and Special Protection Areas (SPAs) under the Birds Directive. A further network of national designations will be created under the Marine and Coastal Access Act 2009 and the Marine (Scotland) Act 2010.

4 The Marine and Coastal Access Act 2009 created the Marine Management Organisation as the main regulatory body for maritime planning issues in English and UK waters and made considerable changes to the governance arrangements in England and Wales. The Marine (Scotland) Act 2010 made similar changes with respect to Scottish waters and comparable changes are expected in Northern Ireland. Meanwhile the Marine Strategy Framework Directive (OJ 2008 L164/19) has been adopted and the Commission has issued a communication on wind energy, 'Offshore Wind Energy: Action Needed to Deliver on the Energy Policy Objectives for 2020 and Beyond' (COM(2008) 768 final).

5 In accordance with art 6 Habitats Directive as implemented by the Conservation of Habitats and Species Regulations 2010 (SI 2010/490) and the Offshore Marine Conservation (Natural Habitats, etc) Regulations 2007 as amended.

6 The Conservative Party is supportive of a new generation of nuclear power stations whereas the Liberal Democrat Party is opposed. The Coalition Agreement ('The Coalition: Our Programme for Government') (http://www.cabinetoffice.gov.uk/media/409088/pfg_coalition.pdf) makes it clear that, while the Liberal Democrats may speak against the nuclear power statement, when it is presented to Parliament they will abstain from any vote. The issue is further complicated by the appointment of Chris Huhne as Secretary of State for Energy and Climate Change as he had the reputation of being one of the most outspoken of the anti-nuclear politicians. Nevertheless, speaking at the Liberal Democrat conference in September 2010, he told delegates that there is an important place for new nuclear stations as long as there is no public subsidy (as reported in *The Daily Telegraph* 21 September 2010).

7 The IPC was set up under the Planning Act 2008 to provide a more efficient process for dealing with major planning applications. One of its roles is to license power generation projects generating more than 100 MW and this means that it has a role in the marine renewable governance. However, the new government made clear its intention to abolish the IPC and it was included in the list of abolished quangos published on 14 October 2010 (http://www.cabinetoffice.gov.uk/CAB167-19).

Types of marine renewable energy generators

Offshore wind farms

Wind farming, the main renewable resource on land, is relatively benign to wildlife and the environmental concerns tend to be about impacts on landscape appreciation. Community issues, including concerns over the welfare of people living in the vicinity of the turbines, have been the biggest thorn in the developers' side. Offshore wind farming provided the industry with a way of largely avoiding this issue and offering a neat solution to nimbyism.

It is anticipated that over one-third of the UK electricity needs could be supplied by offshore wind generation. The process for allocating sites is carried out in a series of 'rounds' conducted by the Crown Estate in which developers bid for leases. Existing leases granted under Rounds 1 and 2 are expected to result in 8 GW; 6.4 GW are planned for Scottish territorial waters and Round 3 aims to achieve a further 25 GW.[8] The technological success of offshore wind farms has encouraged interest in other forms of marine renewable energy, this time exploiting wave and tidal energy.

Wave energy

Capturing energy from the waves is not a new idea but it has always been considered to be technologically challenging because the forces involved are so great.[9] The UK has a long but punctuated history of research and development into wave energy. The oil crisis of the 1970s stimulated research into suitable technologies of which the most famous was the Salter Duck. The UK Wave Energy Research Programme was, however, abandoned in 1982, apparently because of concerns over the economic viability of the technology. Subsequent analysis of data shows that the decision was probably made on a miscalculation.[10]

The main environmental issue with wave energy technology is not about the generator causing environmental harm but rather about preventing the environment from causing harm to the generator! Various companies have been working on robust experimental wave energy generators and commercial testing at sea is in its early stages. There are three main types of device that could be used in UK waters. These are anchored buoys, segmented devices, and oscillating water columns. Wave energy has the potential to become a major source of UK energy. Government has estimated that the UK has access to about one-third of the wave power resource in Europe.[11] Test facilities for wave energy devices are being established in Cornwall and the Wave Hub marine energy project was installed on the seabed in September 2010.[12] A test facility for both wave and tidal energy, the European Marine Energy Centre, has been established in Orkney and the latest information indicates that this, too, will have operational wave energy devices under commercial trial later this year.[13]

Tidal energy

Tidal energy can be exploited in two different ways: tidal stream devices and tidal range devices. Tidal stream devices are based on utilising the energy from the flow of water whereas tidal range devices exploit changes in the height of the water caused by the tides. The European Marine Energy Centre provides full scale commercial testing facilities for tidal stream devices and the Crown Estate has launched a leasing competition for demonstration and commercial projects in the Pentland Firth and the waters around the Orkneys. A 1.2 MW tidal stream device called SeaGen has been installed for testing in Strangford Lough, Northern Ireland, and there have been proposals for similar devices at other sites, including the waters off Anglesey in North Wales.[14]

Wave and tidal stream devices are all relatively small projects but could collectively achieve an estimated practical resource level of 50 TWh/year for wave energy in the UK and a potential of 17 TWh/year for the tidal stream power generation.[15] This compares with an estimated 17 TWh/year for a large tidal barrage across the Severn Estuary which amounts to about 5 per cent of the UK's electricity needs.

Severn Tidal Power Feasibility Study

In 2007 the Sustainable Development Commission (SDC) published a report[16] advising government that 'there is a strong case to be made for a sustainable Severn barrage'. It acknowledged that such a barrage could lead to a loss of biodiversity and require a 'compensatory habitats package' to maintain the Natura 2000 network but saw this as an integral part of any barrage proposal that might even provide an 'environmental opportunity' for linking the compensatory habitats package to climate change adaptation.

The UK Government and the Welsh Assembly Government (WAG) responded to the report by launching the Severn Tidal Power Feasibility Study in January 2008.[17]

8 For further information see The Crown Estate 'Marine Offshore Wind Energy' at http://www.thecrownestate.co.uk/offshore_wind_energy.

9 For an informative overview of the physics behind wave energy together with a brief summary of the types of technology developed and the history of the research see Wikipedia on *Wave Power*, available at http://en.wikipedia.org/wiki/Wave_power#cite_note-48.

10 See evidence from Professor Salter to the House of Commons Select Committee on Science and Technology, 'Wave and Tidal Energy' Seventh Report Session 2000–01 HC 291.

11 See *Atlas of UK Marine Renewable Energy Resources*, available at http://www.renewables-atlas.info/.

12 For details of the background to this project, see http://www.wavehub.co.uk.

13 http://www.emec.org.uk/orkney.asp.

14 Anglesey is seeking to maximise its natural advantages of location and renewable resources to establish the Anglesey Energy Island concept with a view to encouraging investments in research, design and technology using the island as a base. For further information see http://www.anglesey.gov.uk/.

15 According to the Executive Summary of the UK Government's 'Marine Energy Action Plan 2010 Executive Summary and Recommendations' available at http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/explained/wave_tidal/funding/marine_action_/marine_action.aspx.

16 SDC 'Turning the Tide: Tidal Power in the UK' (October 2007) p 13.

17 Full details of the study, including the technologies under consideration, are available at http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/severn_tidal_power/severn_tidal_power.aspx and http://cymru.gov.uk/topics/environmentcountryside/energy/renewable/severntidal/?lang=en&ts=1.

This study was completed in 2010. Its purpose was to determine if a Severn tidal power scheme could be supported and, if so, on what terms. The SDC restricted its consideration to a tidal barrage but the Feasibility Study went wider and considered other established and embryonic technologies. Phase 1 of the study identified a long list of 10 potential schemes including barrages, lagoons, a tidal reef and a tidal fence and set the scope for an SEA. The scoping report looked at a wide range of environmental and social factors. In summary, it concluded that all the schemes offered considerable potential for long term energy generation but it also identified a number of key issues, notably a reduction in intertidal habitats which would probably lead to displacement of birds and could have implications for coastal flooding; restriction on the passage of migratory fish that could have serious implications for their survival; and the effects on the overall morphology of the estuary. The Severn Estuary is an SPA and a Ramsar site.[18] The Severn Estuary, Usk and Wye are all SACs. The preliminary screening report for the Habitats Regulations Assessment carried out as part of the scoping report considered 34 separate designations. Given the scale of the schemes, the authors could not reach a conclusion as to whether it would be possible to compensate for the habitat loss.

In January 2009 the government announced[19] that it would proceed to consultation on the short listing of five schemes – the Cardiff to Weston Barrage (otherwise known as the Severn Barrage), two smaller barrages (Shoots and Beachley) and two lagoons (Bridgwater Bay and Welsh Ground) – and the scope of the SEA. A second consultation was to follow before a decision is made later in 2010.

The initial environmental response to the announcement of the Feasibility Study was mixed. It followed not that long after a previous costly exploration into the possibilities of a Severn Barrage which had concluded against such a development[20] and there were concerns that more money would be wasted going over the same grounds only to reach the same conclusions. Of the five shortlisted sites, the cheapest comes out at an estimated £2.3 bn with an output of 626 MW and the most expensive, £20.96 bn with an output of 8.64 GW.

On 18 October 2010, the government announced that it does not see a strategic case for bringing forward a tidal energy scheme in the Severn Estuary at this time, although the option to revisit schemes in the future has been left open in recognition of the enormous energy potential for the site.[21]

Marine renewable policy

The Labour administration advocated and supported the development of marine renewables over many years and most recently published its Marine Energy Action Plan 2010.[22] There is every indication that the commitment to marine renewables will be maintained by the new government. The plan sets out a vision for the marine energy sector through to 2030 and is predicated on the need to drive forward emerging technologies thereby capitalising on the UK's world-leading position in wave and tidal stream technology and the high level of suitable resource. Five high level themes are identified:

- the need to prove the technology
- provision of appropriate regulatory frameworks
- ensuring appropriate funding
- co-operation and engagement across the sector
- the importance of interdependency of all these themes.

It is noteworthy that environmental considerations are not explicitly identified in this list, although presumably they are intended to be included in the reference to regulatory frameworks. The 'key recommendation' in this context is as follows: 'the UK Government [should] set up and participate in a representative strategic coordination group of statutory agencies and other relevant stakeholders to produce a planning consenting roadmap that explores the key issues surrounding the deployment of devices'.

Turning to the details, the plan recommends that the Department for Energy and Climate Change (DECC) 'ensures that the work undertaken in the [Government's] SEA [of UK Offshore Energy] relating to environmental monitoring and effects is fed in to the Action Plan workstream on developing a pragmatic and proportionate approach to the environmental monitoring of marine energy deployment'. Whether or not this will ensure appropriate environmental protection is unclear! The Executive Summary of the report was prepared by DECC, which may account for the slant, but a wide range of key organisations is identified, including the statutory nature conservation agencies.

In Wales, WAG launched its Marine Renewable Energy Strategic Framework in 2007[23] with the aim of understanding the potential for exploitation in the context of sustainable development. In her statement launching WAG's strategic approach to energy,[24] the Environment Minister, Jane Davidson, announced that work on the Framework study would continue in order to collate all the relevant environmental data for the seas of Wales. In her Ministerial Policy Statement on Marine Energy in Wales[25]

18 Designated under the Convention on Wetlands of International Importance 1971 (Ramsar Convention) 11 ILM (1972) 963.

19 In a Ministerial Statement, Ed Miliband, Secretary of State for Energy and Climate Change at the time, announced a public consultation on the conclusions of the first phase of the study and identified the shortlisted projects: HC Written Answers 26 January 2009, available at http://www.parliament.the-stationery-office.co.uk/pa/cm200809/cmhansrd/cm090126/wmstext/90126m0001.htm.

20 In its 2003 Energy White Paper 'Our Energy Future – Creating a Low Carbon Economy' (February 2003 Cm 5761) the government concluded that 'it is clear that plans for a Severn Barrage would raise strong environmental concerns and we doubt if it would be fruitful to pursue it at this stage'.

21 Further information is available at http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/severn_tidal_power/severn_tidal_power.aspx.

22 Note 15.

23 Available at http://cymru.gov.uk/topics/environmentcountryside/energy/renewable/marine/framework/;jsessionid=F69XL21JTjIf3NqTw77kfJ2W517ZPpZTyHX1yrt2Wxm9kz3C7Jw2!-1663152170?lang=en&ts=1.

24 'A Low Carbon Revolution' available for download at http://wales.gov.uk/about/cabinet/.

25 Available at http://cymru.gov.uk/topics/environmentcountryside/energy/renewable/marine/marineenergy/?lang=en&ts=1.

made in July 2009, the Minister announced proposals for '[maximising] the very significant marine energy resource from around our coasts as soon as possible with the minimum of local environmental impact'. These proposals included working to bring the Severn Tidal Power Feasibility Study to a conclusion in 2010 and utilising the outputs of the study to explore the potential for tidal range projects elsewhere in Wales and completing an initial wave and tidal stream SEA for energetic waters by 2011/12. While there is no commitment here to the construction of a tidal barrage, the implications are that the Severn Estuary is expected to be utilisable in some way for energy generation. The only specific reference to environmental issues comes in the intention to liaise with all parties to ensure that potential environmental impacts are fully considered as individual projects are developed.

Meanwhile, the Scottish Government has launched its SEA and Draft Development Plan for Offshore Wind Development in Scottish Territorial Waters[26] setting out proposals for projects up to 2020 and beyond. These include progressing 10 sites identified by the Crown Estate for potential offshore wind energy development based on the conclusion that there are no significant environmental effects which cannot be avoided or reduced. First Minister, Alex Salmond, has recently announced plans for the creation of three regional offshore energy manufacturing sites to be built around key port locations.[27]

The regulatory framework

Development consents

The piecemeal approach to regulating offshore industries was one of the motivations for the passing of the Marine and Coastal Access Act 2009. This Act established the Marine Management Organisation (MMO) which has responsibility for licensing offshore energy generating installations of between 1–100 MW. At the present time, licences and consents are required under the Food and Environment Protection Act 1985 (FEPA), the Coast Protection Act 1949 (CPA) and the Electricity Act 1989 s 36. Because of devolution, however, the regulatory regime has not become as streamlined as some might have envisaged. The MMO issues licences and consents in respect of English waters; in the devolved administrations responsibility rests with the national governments. However, s 36 Electricity Act 1989 consents in Welsh waters are issued by the MMO which also issues CPA consents for developments in Scottish waters beyond 12 nm.

FEPA licences are required for the deposit of any material in the sea for, inter alia, the purposes of construction. CPA consents are required where there is a potential navigational hazard. Section 34 of the Act provides that, where obstruction or danger to navigation is caused or is likely to result, the prior written consent of the authorising body is required for the construction, alteration or improvement of any works, the deposit of any object or materials or the removal of any object or materials below the level of Mean High Water Springs. Section 36 Electricity Act is the legislative provision for consenting for power generation plants and normally applies for the construction, extension and operation of facilities generating over 50 MW of electricity. In accordance with the Energy Act 2004, s 36 consent requirements are expressly required for generating stations in territorial waters and within the wider Renewable Energy Zone.[28] The Act also amends s 36 to empower the Secretary of State to extinguish public rights of navigation in the vicinity of offshore power plants situated within territorial waters. Smaller schemes, above 1 MW capacity, have been brought within the consent procedure[29] and are, therefore, subject to the usual EIA procedures for offshore stations.[30]

To add a further complication, the consents under the Electricity Act and CPA are not necessary if the developer chooses to apply for an Order under the Transport and Works Act 1992 but this route is only available for projects within territorial waters. Orders are made by the Secretary of State or WAG depending on locality.

In addition, an applicant will have to obtain a lease or other form of licence from the Crown Estate which owns most of the seabed out to 12 nm. The Energy Act 2004 vested rights to the Crown Estate to grant leases for the generation of renewable energy on the continental shelf within the Renewable Energy Zone out to 200 nm.

Defra issued a consultation paper[31] on the implementation of the streamlining provisions of the Marine and Coastal Access Act in July 2010 with the intention of moving to the new regime by spring 2011. This consultation closed in October 2010.

Environmental assessment

Offshore renewable energy projects are covered by the Environmental Impact Assessment Directive which is implemented in the UK under a number of different regulations relating to the nature of the development in question and the geographical location. Because offshore energy productions are subject to a number of different

26 Available at http://www.scotland.gov.uk/Publications/2010/05/14155137/0.

27 'New Jobs Potential in Renewables' (News Release 27 July 2010), available at http://www.scotland.gov.uk/News/Releases/2010/07/27150157.

28 The Renewable Energy Zone was declared by Order in Council under s 84 of the Energy Act 2004 (Renewable Energy Zone (Designation) Order 2004 SI 2004/2668) to extend to a maximum of 200 nautical miles from the baseline and is the same area for which the UK has claimed rights under the UN Law of the Sea Convention in relation to a similar area (the UK pollution zone) in relation to the protection and preservation of the marine environment, under the Merchant Shipping (Prevention of Pollution) (Limits) Regulations 1996 and 1997. The Marine and Coastal Access Act 2009 amended the legislation so that these zones are designated by reference to the exclusive economic zone as declared under the Marine and Coastal Access Act 2009 s 41.

29 The Electricity Act 1989 (Requirement of Consent for Offshore Wind and Water Driven Generating Stations) (England & Wales) Order 2001 SI 2001/3642.

30 Under the Electricity Works (EIA) (England and Wales) Regulations 2000 SI 2000/1927 as amended by the Electricity Works (EIA) (England and Wales) (Amendment) Regulations 2007 SI 2007/1977.

31 'Second Consultation on Secondary Legislation under the Marine and Coastal Access Act: Part 4 Marine Licensing' available at http://www.defra.gov.uk/corporate/consult/marine-licensing-system/index-htm. Similar consultations were held in the devolved administrations.

licensing provisions they are also covered by a number of different EIA regimes although, in practice, there is only need for one Environmental Statement (ES) to be produced. The main regulations are the Marine Works (Environmental Impact Assessment) Regulations 2007.[32]

The SEA Directive requires environmental impact assessments to be carried out in relation to plans as well as projects. There have been several SEAs into offshore energy generation of which the latest to report is the SEA of the Draft Plan for Offshore Wind Energy in Scottish Territorial Waters. This concluded that there are no significant environmental impacts which cannot be avoided or reduced through appropriate project planning and development in the leasing round. The SEA defines a 'significant' effect as one 'that may occur that the regulatory authorities need to be aware of and consider in any proposals for development'. Although the Scottish legislation is slightly wider than its equivalent in England, the process is broadly similar to that which was applied for the SEA of the three strategic areas identified by the Department of Trade and Industry (DTI) for Round 2 wind farm developments[33] and the subsequent SEA for UK offshore energy.[34]

Habitats Directive assessments

Under the Habitats Directive any plan or project not directly related to the conservation of an SAC but likely to have a significant effect thereon, either individually or in combination with other plans or projects, must be subject to an appropriate assessment of its implications for the site's conservation. Approval for the plan or project must not generally be given unless it is ascertained that it will not adversely affect the integrity of the site. The Directive applies to the marine territory of Member States. It follows that, if a renewable project is proposed for siting in a designated site (which could be either an SAC or an SPA designated under the Birds Directive) or if it is likely to impact upon the site, there must be an appropriate assessment of its effects if these are considered significant.

Unfortunately for potential developers (and for DECC), sites suitable for offshore renewables often coincide with sites with international designation for nature conservation. In the case of tidal energy schemes this should come as no surprise because it is the tidal conditions that dictate both the ecology and the energy potential. Offshore wind farms need to be sited where there is suitable substrate at a reasonable depth within sufficient proximity to the coast. Submerged sandbanks are often considered suitable but these are one of the categories of habitat listed for protection in Annex I of the Directive.

Are renewables and conservation compatible?

There is no necessary conflict between renewable energy and nature conservation. The Renewable Energy Deployment and Environmental Issues Project Board, which includes the government departments and the statutory nature conservation agencies, has issued a statement[35] proffering strong support for a large increase in renewable energy and recognising that in some cases there may be adverse local environmental impacts which should be addressed through the planning and assessment process. At the same time, they note that projects generally, especially large projects, have to be carefully sited.

The procedures for siting offshore wind farms seem to have worked well so far and the recent Scottish SEA suggests that there is potential to expand the number of sites. Wave energy devices are relatively small and are unlikely to result in significant damage to habitats but there may be implications for marine animals affected by the noise. There have been concerns over the placement of tidal stream devices, however, mainly because tidal streams are rare habitats supporting unique flora and fauna. The SeaGen device in Strangford Lough is a case in point. The siting of SeaGen was controversial because Strangford Lough is highly protected. It is the only Marine Nature Reserve (MNR) in Northern Ireland (and one of just three designated under the now defunct MNR legislation[36]) and is an SAC. Critics found it difficult to accept that the government was prepared to take a risk with this site and would have preferred approval to be refused on the basis of precaution. One of their main concerns was that the physical presence of the device would form an obstruction for animals moving into and out of the lough and would result in injury to seals. Not all conservationists shared their concerns, however. Some were persuaded that it was worth giving the device a try. They did not think it would result in significant damage and were convinced that there were sufficient safeguards in place to ensure its removal if it was shown to be harmful. Others remained worried.

32 SI 2007/1518. These regulations apply in relation to the follow types of regulated activities in the marine area: activities which are regulated under FEPA; works regulated under s 34 of CPA and harbour works which require approval or consent pursuant to a local Act or an order made under ss 14 or 16 of the Harbours Act 1964. The Transport and Works (Applications and Objections Procedures) (England & Wales) Rules 2000 SI 2000/2190 apply where the TWA route is chosen. Applications for consents under the Electricity Act s 36 must be accompanied by an ES prepared under the Electricity Works (EIA) (England and Wales) Regulations 2000 SI 2000/1927 as amended by the Electricity Works (EIA) (England and Wales) (Amendments) Regulations 2007 SI 2007/1977.

33 DTI Consultation Paper November 2002 'Future Offshore: A Strategic Framework for the Offshore Wind Industry'. http://webarchive.nationalarchives.gov.uk/tna/+/http://www.dti.gov.uk/energy/leg_and_reg/consents/future_offshore/FutureOffshore.pdf/

34 In 2007 the Department for Business, Enterprise & Regulatory Reform launched an SEA of UK waters to determine the location of sites most and least suitable for offshore wind farm development. DECC, which now has responsibility for this policy area, conducted an SEA of a draft plan/programme to enable further rounds of offshore wind leasing and offshore oil and gas licensing in UK waters, including the underground storage of combustible gas in partially depleted oil/gas reservoirs. Following acceptance of the SEA after public consultation, the plan was adopted in June 2009.

35 Available at http://www.decc.gov.uk/en/content/cms/what_we_do/uk_supply/energy_mix/renewable/res/res.aspx.

36 The Wildlife and Countryside Act 1981 ss 36–37 provided for the established of marine nature reserves in Great Britain; similar measures were included in the Nature Conservation and Amenity Land (Northern Ireland) Order 1985 and these were used to establish Strangford Lough as an MNR.

Nevertheless, consent was given for the device to remain in place for five years. It started generating energy in 2008 and successfully recorded 1000 hours of operation in March 2010.

Tidal stream devices, by their very nature, individually can never be major contributors to the UK's renewable energy target. Larger schemes, in the form of some sort of tidal barrier, could be significant contributors but, equally, could have significant environmental implications. The proposal to harness the tidal power of the Severn Estuary provides a timely example of the issues involved. The scale of the proposals, especially the Severn Barrage itself, is enormous in terms of energy production, cost, social impact and, of course, environmental impact.

(Is there) A way forward?

As noted above, the SDC concluded that there is strong case for a sustainable Severn barrage, although they made it clear that 'proponents ... must be prepared to fully comply with ... EU Directives, including the requirement for a fully compensatory habitats package to be in place before a barrage is built'.[37] They do not favour a relaxation of the Habitats Directive but instead believe that the 'UK's legal obligation to protect habitats and species that contribute to the overall viability of the Natura 2000 network should be vigorously upheld'.[38] With respect to the SDC this sounds a bit like 'having your cake and eating it' to me. Given the scale of the changes that would result from a Severn barrage it seems improbable to me that the loss could be compensated, especially given the preliminary findings of the Feasibility Study that there was considerable scientific uncertainty over what the impacts would be. To go further and state that compensation should be effected before commencement of construction does not seem practicable.

The European Court's interpretation of the Habitats Directive has turned it into an extremely powerful conservation mechanism. Without it there would be no marine protected areas of any importance in the UK. The requirement for Appropriate Assessments has ensured that assessments for new developments do take proper account of ecological consequences and the Habitats Regulation Assessment (HRA) has become a powerful partner to, and component of, strategic environmental assessments. I question, however, whether this has necessarily resulted in improved conservation. Determining site impacts at the level of a strategic assessment can be largely meaningless, especially when it comes to determining possible compensation requirements, but the completion of a satisfactory HRA is regarded as a positive step on the way towards gaining approval to proceed. To my mind, this can be dangerous because it can give the impression that the conservation issues can be resolved. And this is the real problem with the Directive. Apart from the protection offered by the mere labelling of a designation, it is difficult to show that the process provides any real benefit. The success of the Natura 2000 network created under the Habitats Directive is measured by compliance with 'favourable conservation status'. The conservation status of a natural habitat is taken to be favourable when:

- its natural range and areas it covers within that range are stable or increasing
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future
- the conservation status of its typical species is favourable.[39]

Given the difficulties of carrying out marine environmental research and our paucity of knowledge over the extent and movement of marine species, I think we kid ourselves when we assess the conservation status. Nevertheless, I agree that it would not take a great stretch of imagination to conclude that a Severn barrage would have an adverse impact on the conservation status of affected habitats and species. It would be impossible to recreate the conditions in the Severn Estuary anywhere else so compensation would have to entail the creation of something deemed to be of equivalent conservation value. Even if this could be done, the decision on what the measure of equivalence is would have to be a matter of judgment and policy and would not be a purely scientific one. I would argue, therefore, that strict adherence with the spirit and objectives of the Directive could not be achieved even if new habitats were to be created.

The next question is whether the Directive remains fit for a changing world, faced with climate change. The determination of favourable conservation status refers to, but does not define, the foreseeable future. Article 6 requires Member States to establish the necessary conservation measures, such as management plans, pertinent to the ecological requirements of the site and to take appropriate steps to avoid habitat deterioration. This has been interpreted as a mechanism for creating a rather static Natura 2000 network in which designated sites have to be maintained for the purposes for which they were created in perpetuity. The impacts of climate change are likely to lead to 'natural' changes to ecosystems and habitats, notably as a consequence of sea level rise, and the question arises as to when it would be acceptable to abandon the original purpose, if ever. It would be a bizarre outcome of the original legislation if the Habitats Directive created a network that had to be fixed in time. If, as seems likely, there will be a way in which change can be accommodated through flexible application of the Directive, it would surely be sensible to start this process now. The question should not be whether it will be possible to compensate for the loss of the Severn Estuary SACs and SPA. Instead, the decision on whether to construct a barrage should consider a wider number of related questions including:

37 Note 16 p 12.
38 ibid.
39 Habitats Directive art 1(e).

- how long would it be possible to safeguard the designated features in the face of climate change?
- if the barrage is not created, will it be possible to find alternative means of renewable energy generation and, if not, how many other sites will be affected by climate change as a consequence of this failure?

Further light into these questions may be forthcoming from the more detailed assessments made by the Severn Tidal Power Feasibility Study.[40] In particular, we would need to have a better idea of what the estuary would look like post-construction and a more reliable indication of how long the proposed technologies might be expected to deliver energy.

In the event, the decision not to proceed with the project because of the economic recession means that the issue does not need to be considered further at the present time. But the debate is not completely closed. The Secretary of State for Energy and Climate Change has stated[41] that government does not intend to review the decision until after 2015, leaving open the possibility that it will then be reconsidered. In the short term, the decision not to proceed may come as a relief to those concerned with protecting biodiversity in the Severn Estuary, but the relief may only be temporary and there is the additional problem now of how to address the needs for more renewable energy if the Severn Estuary is not going to contribute.

Conclusions

Rigid application of the legal obligations surrounding protected area designations has arguably been the main tool for the statutory conservation bodies to ensure that environmental interests are properly accounted for in sustainable development. The recent adoption of an ecosystem approach to environmental management has broadened the understanding of conservation, and biodiversity is now often confused with ecosystem services. While I am firmly of the view that conservation of biodiversity, especially of scientifically interesting features (as originally envisaged by proponents of the UK's earliest protected area designations, the nature reserve and the site of special scientific interest) is a worthy cause in its own right, I am encouraged by the change in general perception of conservation as being on the other side of the scales to development. This approach was based on taking conservation as just one more sectoral interest which had to fight for its existence against all the others. The new approach does at least see conservation of ecosystem services as fundamental to all these sectors and not something that should be held in the balance.

40 For details of the study see n 21.

41 Statement on Energy Policy by Chris Huhne (Written Ministerial Statement), available at http://www.decc.gov.uk/en/content/cms/news/en_statement/en_statement.aspx.