

**Appendix A - Offshore Energy Strategy Strategic Environmental
Assessment – Consultation Feedback (DECC, 2009)**

The Royal Society for the Protection of Birds

1 April 2019

Planning Act 2008 (as amended)

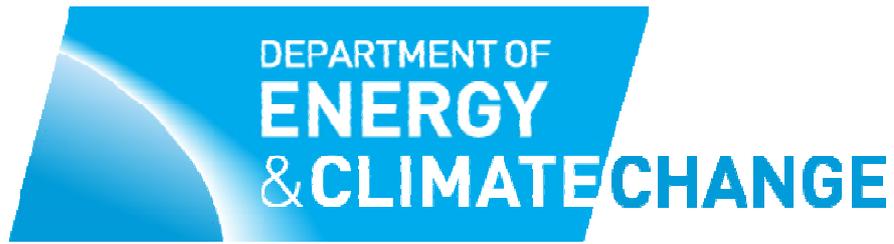
In the matter of:

**Application by Ørsted Hornsea Project Three (UK) Ltd for an Order Granting Development
Consent for the**

Hornsea Project Three Offshore Wind Farm

**Planning Inspectorate Ref: EN010080
Registration Identification Ref: 20010702**





Offshore Energy Strategic Environmental Assessment

Consultation Feedback

JUNE 2009

CONSULTATION FEEDBACK

Responses were received from the following organisations and individuals:

Airtricity
Bournemouth Borough Council
British Wind Energy Authority
Campaign for National Parks
Campaign to Protect Rural England
Centrica
Chamber of Shipping
Countryside Council for Wales
Derek Limbert
DONG Wind (UK) Limited
Dorset County Council
Dutch Fisheries Organisation
Dutch Government
E.ON UK
Eastern Sea Fisheries Joint Committee
Econcern
EDF Energy
EDP Renováveis & Sea Energy Renewables
English Heritage
Environment Agency
Forewind
Forth Ports PLC
Fred Olsen Renewables
Global Marine Systems
Historic Scotland
Inch Cape Offshore Wind Farm Ltd
Joint Nature Conservation Committee
Kate Elridge
Ministry of Environment, Czech Republic
Ministry of Environment, France
National Air Traffic Service En Route Limited
National Federation of Fishermen's Organisations
Natural England
Norfolk County Council
Northern Ireland Environment Agency
Northumberland Sea Fisheries Committee
Ocean Electric Power
Philips Advanced Development Lighting, Netherlands
Renewable Energy Association, Ocean Energy Group
Renewable Energy Systems Offshore

Richard Cowen
Royal Yachting Association
RWE Npower Renewables Limited
Sándor Gera
Save-our-Seas
Scottish Environmental Protection Agency
Scottish Natural Heritage
Scottish Power Renewables
South Downs Joint Committee
South West RDA and Regen SW
Terence O'Rourke
The Crown Estate
The Royal Society for the Protection of Birds
The Wildlife Trusts
Whale and Dolphin Conservation Society
World Wide Fund for Nature UK

Offshore Energy SEA Consultation,
The Department of Energy and Climate Change,
4th Floor Atholl House,
86-88 Guild Street,
Aberdeen,
AB11 6AR

Wednesday 22nd April 2009

Dear Sir / Madam,

COMMERCIAL IN CONFIDENCE: Department of Energy and Climate Change Offshore Energy Strategic Environmental Assessment Consultation
- Airtricity Response

Airtricity is writing in response to the recently published Offshore Energy Strategic Environmental Assessment (SEA) and is pleased to be able to submit its comments on the assessment to the Department of Energy and Climate Change (DECC).

Airtricity welcomes the publication of the DECC Offshore Energy SEA and in particular the confirmation of the likely environmental constraints and data gaps/information requirements for development of offshore wind energy in UK waters. Airtricity recognises that the SEA forms a framework which will support future considerations for offshore projects requiring EIA and the associated licence applications. Therefore it is important that any conclusions are clear and concise, and that the assumptions behind these conclusions are clear. Where the SEA assessment approach differs from an EIA assessment approach, Airtricity believes that this should also be stated transparently in any final document to ensure that the SEA high level approach does not unnecessarily exclude areas where more detailed studies and analysis can show that these are acceptable.

Airtricity has divided its response under the following headings:

- Environmental Information and Data Gaps;
- SEA Screening Criteria used for Spatial Mapping;
 - i. Constraints which are inconsistently reported in the SEA and/or which are considered to be too constrained/should be revisited in terms of existing practical examples.
 - ii. Criteria where an alternative approach to determining hard constraints is recommended.
- Conclusions/Recommendations.

These sections outline and examine the points which raise concern for Airtricity and their likely impacts on future offshore renewable energy developments. Airtricity raises questions regarding outcomes of the SEA and encourages DECC to take into consideration the concerns put forward within this response.

Airtricity would like to thank the Department of Energy and Climate Change for the opportunity to contribute to the SEA and looks forward to receiving the details of the final plan this summer.

Yours sincerely,

Peter Raftery

COMMERCIAL IN CONFIDENCE: Department of Energy and Climate Change Offshore Energy Strategic Environmental Assessment Consultation.

- Airtricity Response

Airtricity has conducted an extensive and detailed screening exercise for the Round 3 bid process, based on the zones offered for bidding by The Crown Estate. Given the Zone-specific nature of this work, it has been conducted at a significantly more detailed level than the SEA analysis. Airtricity has uncovered some differences between the recommendations of the SEA and the results obtained from its screening of the Zones. These discrepancies are included in the comments below.

Airtricity believes that the SEA would benefit from a clear statement advising on the scope of the assessment and that as a fundamental principle, all detailed assessments for the development of offshore energy installations will need to be undertaken at a site specific level.

Environmental Information and Data Gaps

The SEA report identifies a number of subject areas where baseline information is limited. Clearly these will need to be enhanced to support future marine spatial planning and project-specific consenting. These include:

- Seabed topography and texture. For some areas there is excellent data, for example from multibeam mapping undertaken by the MCA, BGS and the SEA programme, but the UK lacks a coordinated programme to marshal such data, to identify priority gaps and to find ways to fill them.
- Recent information on the distribution of fish eggs and larvae, and variability in space and time.
- Details of bird migration patterns, and variability in space and time including flight heights in different weather conditions.
- An understanding of the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs.
- Ecology of most marine mammal species and in particular important areas for breeding, foraging and resting.
- Finer scale distribution of fishing effort, gears and catches for smaller vessels (<15m).
- Precision on the offshore distribution of shipping (AIS data coverage typically only extends 80km from shore).
- Effects on fishing activity in and immediately adjacent to constructed wind farms.

It would considerably enhance the value of the SEA if the final plan expanded on how these data gaps may be filled, and who would take a lead role in funding and managing data gathering exercises.

SEA Screening Criteria used for Spatial Mapping

- i. Constraints which are inconsistently reported in the SEA and/or which are considered to be too constrained/should be revisited in terms of existing practical examples**

Navigation

1nm buffer around primary shipping routes as identified by the SEA using 2007 AIS data

Within the SEA, analysis of Automatic Identification Systems (AIS) data identifies primary navigational routes for shipping based on data taken in 2007. A 1nm buffer is then suggested to be applied to the

routes based on the 'high' to 'medium' risk threshold, as defined in the shipping route template in Annex 3, Template for assessing distances between wind farm boundaries and shipping routes of Marine Guidance Note 371. The SEA suggests that a larger buffer may be required where *'additional factors such as traffic density and tidal set increase local risk'*.

Airtricity are concerned that the data set analysed for the SEA consists only of 4, one week periods – this is too short a sample period to fully characterise an area and make informed judgements. Airtricity considers that it is necessary to collect a longer duration data set (for example one year of full data) – at the moment there is a risk that the short period of data collected may not be giving a true picture of the long-term shipping activity.

Airtricity would also like to see a clear justification of the method of analysing the AIS data. It appears from a comparison with our work that the SEA has applied a lower threshold of density during their analysis than is standard within the offshore wind industry for EIA navigation risk assessment. Airtricity would normally consider over 4 vessels a day to be significant. The lower threshold utilised in the SEA work results in much wider shipping lanes.

Airtricity would like to draw attention to page xvi of the non-technical summary, which states that "windfarm siting should be outside areas important for navigation (these are mapped in the Environmental Report)". This could be interpreted as defining exclusion zones within the SEA. This would not be appropriate given the limitations in the navigation assessment conducted (as detailed above). It is requested that this paragraph to be rephrased.

Airtricity would also promote the periodical review and refinement of shipping lanes to ensure an accurate view of the actual shipping activity is always maintained.

Coastal Buffer

Presumption that the bulk of windfarms should be sited outwith 12nm of the UK coast.

The SEA identifies an area, extending to 12nm from the coast, where development of offshore wind farms of over 100MW in size are typically prohibited for a variety of reasons including impacts on landscape and seascape, coastal fishing, tourism and recreation and coastal ecology. Although Airtricity is aware that development within this 'coastal buffer' area is not excluded *per se*, Airtricity has concerns about the potential disadvantageous effect it could have on development around the coast (i.e. in fostering a 'presumption against development' without proper assessment).

Airtricity wishes to indicate its considerable concerns over the arbitrary 100MW windfarm figure. Within the SEA non-technical summary, page xiv, it notes that for reasons of landscape/seascape, windfarms larger than 100MW in size should be sited outwith 12nm from the coast. Airtricity would like to see within the SEA a reasoned justification attached to this 100MW figure as it believes that a threshold of numbers of turbines (rather than MW) would be more appropriate for landscape/seascape issues.

Airtricity is also concerned with the basic concept of a 12 nautical mile limit "buffer zone" as it may have the potential to be used with detrimental effect for developers. Airtricity believes this initiative should be reviewed and amended, to prevent it becoming a barrier to development of offshore wind farms within the UK, together with a clear statement that this does not apply to development in Scotland.

Also pertinent to this debate are the existing approved offshore wind farms within 12 nm in England and Wales. Does the SEA consider there to be a cumulative issue within 12 nm that should be considered in relation to further development? It is currently silent on this issue, but it will be important for ongoing developments.

Airtricity would like to see further evidence based justification as to why the buffer has been set to 12nm. The SEA clearly states that development both within and outwith the 12nm limit would be subject to further, site specific detailed information gathering, which would need to be assessed. It is unclear why a 12nm buffer is therefore required. Airtricity would like to see a clear statement in the SEA that the coastal buffer has to be dealt with on a case-by-case basis.

Airtricity would suggest that a more satisfactory solution would be for the SEA to provide more objective justification for this buffer and also denote that development outside this area was less contentious, and therefore be likely to require a lower level of assessment. Airtricity would suggest that this be developed further within National Policy Statements.

The use of a 12nm coastal buffer has the potential to render visual impact assessment both more onerous and more subjective for those sites closer than 12nm. This reinforces the need for the 'buffer' area to be better specified and in such a way that it is appropriate and not unnecessarily restrictive.

Although the SEA report states that in an 'international' context, Belgium and the Netherlands have adopted wind farm zones beyond 12nm from the coast; there appears to be limited and insufficient justification for application of a similar figure around the UK coastline. Human activities and features of conservation interest within the UK are generally concentrated along the coastline, significantly inshore of the proposed buffer zone, rather than out to 12nm.

Oil and Gas Platforms

Presumption that windfarms should be sited no closer than 6nm to oil and gas infrastructure.

Airtricity considers the SEA approach to oil and gas infrastructure buffer zones is overly cautious and does not reflect existing and accepted practice. Airtricity requests that this 'hard' constraint be reviewed and re-assessed.

Airtricity understands that there is a fundamental safety need, as indicated by the CAA, to maintain a 'buffer' area around oil and gas infrastructure - currently, the default 'buffer' zone is set to 6nm. Within section 5.7.2 of the SEA, the 6nm is assumed, and has been applied, as a hard constraint, regardless of any precedence which has been set during previous offshore windfarm development. For example, Airtricity's consented site West Rijn, offshore of the Netherlands, is located within 0.3nm of the unmanned P15-F platform, within 3.6nm of the unmanned P15-G platform and within 4.4nm of the manned P15-C central production platform. This has resulted in an additional 45km² (or approximately 225MW) being made available to the Development Areas than that which would have been achievable using the SEA mapping constraints.

The net result of this 'hard' constraint would also reduce the possibility for co-existence between the offshore windfarm industry and oil and gas facilities. If this is to be the case, it will put enormous significance on the wind farm overlap guidelines currently being drawn up by BERR/DECC/BWEA. Round 3 developers will not be able to accept a risk that future oil and gas licensing rounds could impose licences contiguous with planned or consented offshore wind projects.

Airtricity, whilst fully endorsing the importance of maintaining safe access (principally relating to helicopter movements) feels it would be appropriate to adopt a less conservative approach to oil and gas infrastructure within the SEA, acknowledging that development closer to oil and gas infrastructure can be (and has been) achieved through successful consultation between developers and platform owners.

ii. Criteria where an alternative approach to determining hard constraints is recommended

Bathymetry: Airtricity considers 50 to 60m depth a soft constraint based on assumptions that there is likely to be an engineering solution to the challenges of developing in these deeper waters.

Dredging Areas: Airtricity applies *active* and *licensed* dredging areas as a ‘hard’ constraint. However it considers that dredging *application* and *option* areas should be viewed as an ‘other’ constraint because although these are precursors to fully licensed dredge areas, the proposed area extents are subject to change and cannot be considered absolute and final. Airtricity recognises the standing of existing licensed dredging operations. However, both dredging application and options areas represent a potential user conflict which could be resolved through consultation and consolidation by The Crown Estate, who is responsible for leasing the sea bed for both industries. It is understood that that there may be a preference for not extending the license of existing areas where environmental damage may have occurred, and that there could be a preference for relocating these areas further from the coast line. Preferred areas for dredging are informed by a Marine Aggregate Regional Environmental Assessment (MAREA), and Airtricity believes that dredging areas should not be considered as a ‘hard’ constraint but that the in-combination effects of these two industries should be considered during the respective zonal appraisals and subject to consultation.

MoD PEXA Areas: In its screening of spatial constraints, the SEA Environmental Report considers MoD Practice and Exercise Areas classified as ‘Danger’ areas as a ‘hard’ constraint, which would exclude offshore wind farm development. Table 5.17 (p.151 of the Environmental Report) implies that all PEXA referenced with the ‘D’ prefix have been treated as a hard constraint in the SEA.

However Appendix 3h of the SEA Environmental Report (in particular Table A3h.5, p.446), indicates that application of this constraint is not consistent, with some Danger areas treated as a hard constraint, and others not. The Appendix text explains this application of the constraint, stating that only Danger areas where live firing occurs are treated as a hard constraint. However it would appear that this is not the case with, for example, PEXA used for live firing in the Moray Firth, which is not considered a hard constraint. Given the extent to which PEXA overlap with a number of Round 3 zones, it would be beneficial if the SEA Environmental Report more clearly explained and justified the application of PEXA as a development constraint.

Airtricity believes that in the interests of consistency and avoidance of future conflict, that these constraints should also be noted within the SEA, as well as government’s position as to their relevance to offshore wind developments. This is because the SEA is intended to influence the Round 3 zone boundaries, and is a material consideration in the assessment of the EIA’s for each project.

Conclusions/Recommendations

The SEA addresses several issues which potentially could be viewed as hard constraints, e.g. distances from coastline, oil and gas platforms, navigation routes etc. There are circumstances where it is possible to construct wind farms within these constraints without severe negative consequences for other stakeholders. Consequently the SEA should be clearer that a site-by-site discussion between

developers and affected stakeholders must take place to identify and assess the impacts from the actual windfarm development plan.

The 12nm coastal buffer needs to be developed from a comprehensive evidence base to ensure that it is applied for the correct reasons and is not unnecessarily restrictive to future offshore wind energy development and hinders the achievement of 2020 aspirations.

The navigation and shipping guidance should be supported by further data to ensure that the large generalisations made are supported by detailed data, or revised as appropriate.

The 6nm buffer zone surrounding oil and gas infrastructure should be assessed on a site by site basis and this should be outlined within the SEA.

Several further potential constraints (MoD PEXA areas, dredging application and option areas) should be taken into account in the SEA to provide a more robust assessment of the area for offshore wind energy installation.

Airtricity would like to thank DECC for providing the opportunity to contribute to the development of the Offshore Energy Strategic Environmental Assessment and looks forward to these issues being addressed in the final document later in the spring/summer.

Your ref:
Our ref:

This matter is being dealt with by: Geoff Turnbull
e-mail: geoff.turnbull@bournemouth.gov.uk

Direct line: 01202 451382

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

20 April 2009

Dear Sir,

UK Offshore Energy SEA Consultation

I note that public consultation on the UK Offshore Energy SEA Environmental Report is now in progress and will close on 22 April 2009.

At a meeting of the Council's Overview Board on 8 April 2009, Members discussed the implications on the environment and tourism for Bournemouth of the Zone 7: West Isle of Wight Wind Farm proposals, contained in the Crown Estate's UK Offshore Round 3 Wind Energy Programme.

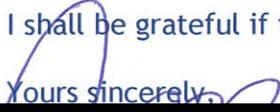
The following issues were raised:

- the lack of engagement with the public and key stakeholders by The Crown Estate,
- the visual impact of the turbines from the beach and the cliffs,
- the impact on safety of small craft,
- the implications on ferry services and shipping routes to Poole Harbour,
- the impact on marine life (in particular from undersea noise),
- the implications of the current economic climate on the timetable for the proposals, and
- the environmental implications of other alternative sources of renewable energy.

The Council agreed that the proposals for the West Isle of Wight wind farm be supported, subject to there being meaningful public consultation and that the implications for shipping routes, small sailing craft safety and marine life be considered.

I shall be grateful if the above issues can be taken into account in your public consultation process.

Yours sincerely,


Major Engineering Developments Manager

cc Hannah Cherry, The Crown Estate, 16 New Burlington Place, London W1S 2HX



Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

BWEA Offshore Energy SEA Consultation Response

The British Wind Energy Association (BWEA) is the leading UK renewable energy trade association. With over 470 corporate members BWEA represents the large majority of the wind, wave and tidal energy companies in the UK.

BWEA is informed by an established and active network of working groups consisting of leading experts in the offshore wind industry. BWEA has received multiple individual contributions on the consultation from member companies and has also carried out an informative, half day, SEA focused workshop attended by key industry players designed to help formulate this consultation response.

BWEA is therefore suitably well placed to comment on the SEA report for offshore energy. General comments are described below and comments on the report's recommendations follow in section 2.

BWEA hope that the our consultation response is useful and constructive in forming the Government's decision statement. BWEA are fully committed to working with the Government to further our mutual ambitions for maximising offshore renewable energy generation and volunteer the use of our network of industry working groups.

Please do not hesitate to contact me should you have any questions.

Yours sincerely

Duncan Ayling
BWEA Head of Offshore Renewables
0207 901 3018
d.ayling@bwea.com

1. General comments

- A. BWEA welcome the SEA report's high level statement that "...*there are no overriding environmental considerations to prevent the achievement of the wind elements of the plan/programme*". However, this statement is qualified with "*albeit with a number of mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea.*" It is therefore in the detail of these mitigation measures that lie the industry's concerns. These are addressed in section 2.
- B. BWEA believe that Government's 2020 renewable energy targets are of such strategic importance to the nation that a *presumption in favour* of renewable energy development should be written into the National Policy Statement for renewable energy.
- C. Marine spatial overlaps with sea users highlight conflicting governmental policies being pursued by different government departments. BWEA believe that a cabinet level sub-committee for renewable energy is needed to coordinate the strategic delivery of the Government's 2020 renewable energy targets.
- D. The SEA report is generally considered to be "unhelpful" to maximising delivery of offshore renewable energy. The report contains a theme of presumption against renewable energy development wherever spatial conflict arises. The offshore wind industry appears to be treated as lower priority than other industries.
- E. It is vital that a holistic approach is adopted whereby the recommendations from the SEA are balanced against economic drivers and the current lack of any offshore transmission network to ensure that delivery of offshore wind is both practical and economically feasible.
- F. It is vital that the government recognises the importance of near shore offshore wind development and the significant benefits for practical, cost efficient construction and operation. There appears to be no clear basis for the recommendation against much development taking place within the 12nm limit. The increased risk to the plan of pushing development long distances from shore has not been taken into account in the SEA report but should be in the subsequent Government thinking.
- G. The environmental benefits of offshore renewable energy development brought through climate change mitigation should receive a much higher prominence.
- H. Uncertainty remains within industry as to the influence of the SEA report; how Government will translate the information into policy; and what influence it may have on the National Policy Statement for renewable energy. BWEA understands the process to be as below but requests that this is confirmed and communicated to industry:
 - o The government decision statement on the SEA is intended to be published in June 2009. The statement will come in the form of a

comprehensive report and it is this decision report which will inform, or be referenced in, the NPS for renewable energy

- I. Industry requests, through BWEA, the opportunity to feedback on the government's decision report prior to publication.
- J. Any delay on the government's decision after consultation will maintain uncertainty and prolong high levels of risk for developers.

2. Comments on the SEA Report Recommendations

1. In areas with high renewable energy generation potential DECC should ensure decisions on renewable energy leasing and licensing for oil & gas (including natural gas storage) are coordinated to minimise potential sterilisation of areas for other industries. This recommendation extends to maintaining options for potential future geological storage of captured carbon dioxide.

- 1.1. It is vitally important that areas with high renewable energy potential are not sterilised unnecessarily. Rigorous, strategic consideration needs to be given to the benefits and costs of limiting use to one interest or activity over another. BWEA support a coordinated approach to minimize sterilisation for other industries however it should be remembered that suitable areas for offshore wind are limited by water depth and seabed conditions so cannot be easily relocated.
- 1.2. Careful consideration should be given to an automatic presumption against development due to spatial conflict. Spatial conflicts should examine mitigation rather than expulsion and/or compensation.
- 1.3. Although developers do not want to negatively affect safety, the oil and gas installation 6nm exclusion zone should not be considered a strict boundary as it can be negotiated on a case by case basis with the relevant installation owners. Examples where this has happened are Beatrice and Ormonde.
- 1.4. A major issue with oil and gas spatial conflict is in the lease condition stating that oil and gas interests take priority and the financial risk that this imposes on offshore renewable projects. However, this is not considered to be an SEA issue.

2. The draft plan/programme for an additional 25GW of offshore wind farm (OWF) generation capacity will require wind farm development on a massive scale. In advance of a formal marine spatial planning system being in place for the UK, the leasing and consenting of OWFs must ensure the minimisation of disruption, economic loss and safety risks to other users of the sea and the UK as a whole. In particular, there should be a presumption against OWF developments which:

- a. impinge on major commercial navigation routes, significantly increase collision risk or cause appreciably longer transit times*
 - b. occupy recognised important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede previous activities)*
 - c. interfere with civilian aviation including radar systems*
 - d. could potentially jeopardise national security for example through interference with radar systems or significant reductions in training areas*
 - e. result in significant detriment to tourism, recreation and quality of life*
- 2.1. Whilst human safety must remain of paramount importance, the scale of the challenge of meeting the UK's renewable energy targets suggests that there will be some disruption of other activities.
 - 2.2. It should be noted that each offshore wind energy project is unique. This is recognised in the existing consenting process with the requirement for Environmental Impact Assessment and stakeholder consultation. With this in mind, recommendation 2 above may be interpreted as simply a general statement against licensing offshore wind farms.

- 2.3. The navigation data used consists of 4 x 1 week of data in 1 year. Whereas at regional and EIA level this is considered adequate for decision making purposes it is not sufficient to draw conclusions on a UK wide SEA scale. Detail at regional or EIA level would show different results. The SEA should therefore not rule out areas that would show up as developable under REA or EIA.
- 2.4. BWEA remained concerned that unpublished data (from the MCA OREI 1 report) was used to mark out shipping density and that the analysis of this data could be interpreted in a different ways.
- 2.5. It appears that large areas have been excluded without explanation. The presumption in favour of shipping in the SEA report contradicts the government's renewable energy plan.
- 2.6. The type of shipping impacted is very important and has not been analysed.
- 2.7. It is not correct to assume that visual impact is negative. Existing near shore offshore wind farms have been well received by coastal communities and statistics have shown an increase in associated tourism.

3. Until there is a firmer base of information available to inform adaptive management, in respect of ecological receptors a precautionary approach to siting is recommended since the offshore wind industry is relatively young, with appreciable technological development expected in for example, turbine size, rotation speed, spacing and potentially rotational axis. This precautionary approach dictates that unless suitable evidence indicates otherwise, avoidance (for the present) of areas known to be of key importance to waterbird and marine mammal populations, including breeding colonies, foraging areas and other areas essential to the survival of populations.

- 3.1. The report quotes the precautionary principle too frequently and liberally. In areas where sufficient data from previous studies exists and the effects are well understood PP should not be quoted.
- 3.2. Consenting authorities should be able to consider results and data collected elsewhere.
- 3.3. BWEA is surprised that in Section 6.2 in the SEA Environment Report, 'Effects Monitoring', there is the conclusion that existing monitoring activity as part of the DECC SEA process is considered to be adequate. BWEA recommend that the programme of monitoring and analysis from Round 2 should be continued by Government to further inform future development.
- 3.4. It should be emphasized that developers are responsible and have invested significant time and money to environmental research to develop with minimal impacts. It is fair to say that offshore developers are driving marine environmental research in the UK.
- 3.5. It should be noted that environmental statutory consultees are keen for win-win situations with dual use and appropriate monitoring. BWEA considered this to be a better solution than exclusion through the over-application of the precautionary principle.

- 3.6. BWEA request that specific guidance is developed from Government to consultees and regulators on a consistent approach to the invocation of the precautionary principle. Developers have experienced a sense of 'moving goalposts' in relation to data required.
- 3.7. In reality, due the changing nature of the marine environment, it will be necessary for developers and regulators to make positive decisions on development in face of some environmental uncertainties if large-scale renewable energy delivery is to be achieved by 2020.
- 3.8. Construction and/or operational restrictions imposed by consent conditions must be mindful of the risk and cost implications for developers.

4. Reflecting the relative sensitivity of multiple receptors in coastal waters, this report recommends that the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km). The proposed coastal buffer zone is not intended as an exclusion zone, since there may be scope for further offshore wind development within this area, but as mitigation for the potential environmental effects of development which may result from this draft plan/programme. The environmental sensitivity of coastal areas is not uniform, and in certain cases new offshore wind farm projects may be acceptable closer to the coast. Conversely, a coastal buffer in excess of 12nm may be justified for some areas/developments. Detailed site-specific information gathering and stakeholder consultation is required before the acceptability of specific major Round 3 or subsequent wind farm projects close to the coast can be assessed. Marine spatial planning proposals are under consideration in Parliament, which would give coastal regulators and communities further opportunities to have a say in the way the marine environment is managed, in addition to the existing routes for consultation as part of the development consent process.

- 4.1. BWEA welcome that there is no exclusion on development near the coast and that development will have to justify plans as usual with Environmental Impact Assessment (EIA). "Detailed site-specific information gathering and stakeholder consultation" is already required and stakeholder consultation requirements are already in place. It is however, unclear if this recommendation adds a new layer of investigations and consultation or if this refers to the existing consenting process.
- 4.2. BWEA acknowledge that the 12nm recommendation is not intended as an exclusion zone but the recommendation that "the bulk of" offshore wind should be outside brings great concern in that the terminology is open to interpretation. Objectors to renewable energy projects will undoubtedly use this 12nm recommendation as a reason to oppose near shore projects. This 12nm recommendation therefore creates increased difficulty for 3 entire Round 3 zones and the closest areas of 2 other zones.
- 4.3. The general 12nm recommendation is arbitrary and will risk the clear economic advantage to near shore construction clearly identified in the Carbon Trust report "Big Challenge, Big Opportunity". Each project should be considered in its own a unique impact and not on general recommendations.
- 4.4. Although the SEA did not cover Scottish Territorial Waters this 12nm recommendation directly contradicts Scotland's plans for offshore wind.
- 4.5. For the reasons above, BWEA recommends that the Government ignores the SEA report's 12nm recommendation. BWEA recommends that Government

does not reference any specific distance in their decision report. EIA is, and will continue to be, sufficient to inform decisions on sensitivity of wind farm proximity to the coast.

5. To minimise habitat change and to ensure areas developed as a result of the current draft plan/programme are left fit for previous or other uses after decommissioning, the volumes of rock used in cable armouring, foundation scour protection and pipeline protection must be minimised and there should be active promotion of alternative protection methods through the consenting process.

- 5.1. Environmental considerations are important in deciding protection methods and materials. However, human safety, security of assets and power generation must not be compromised due to equipment or infrastructure becoming exposed or being made unstable.
- 5.2. BWEA wish to question the significance of this impact on habitat change. When considered in relation to habitats, any residual materials will be minimal and highly localised.
- 5.3. Government, The Crown Estate and industry have worked successfully to develop accepted decommissioning guidelines. Decommissioning plans consistent with international and national obligations must be approved prior to construction.

6. For areas (zones and blocks) which contain good examples of habitats/species on the Habitats Directive Annexes, developers should be made aware that a precautionary approach will be taken and some areas with relevant interests may either not be leased/licensed until adequate information is available, or be subject to strict controls on potential activities in the field. Similarly, developers should note that DECC will continue to conduct Appropriate Assessments/screenings to consider the potential of proposed leasing/licensing and subsequent activities to affect site integrity.

- 6.1. Concerns over the application of the precautionary principle have been previously mentioned in response to recommendation 3.
- 6.2. There remains uncertainty within industry as to how and when Appropriate Assessments (or Appraisals of Sustainability) for Round 3 zones will be undertaken. BWEA request guidance from DECC to give clarity on this issue.

7. The effects of noise on marine mammals particularly from piling and seismic survey remain an issue of debate. A range of mitigation measures are available and their adoption is normally required through consenting. However, there is a need for cross-industry coordination of what noisy activities are planned, where and when, to facilitate the assessment of cumulative effects and implementation of temporal/spatial mitigation actions. The approach would require a mechanism to facilitate the exchange of information, for example through a web-based forum hosted by DECC, JNCC or the future MMO.

- 7.1. BWEA have real concern about how combination noise effects from installation activity, seismic activity and other sectors activity would be dealt with. In particular how this would be addressed in licences application and delivery.

- 7.2. To be effective, cross industry coordination will need to encompass all industries, internationally, that operate in the marine environment not just renewables and oil and gas.
- 7.3. It should be noted that there is still considerable debate amongst specialists as to the significance of noise on marine mammals.

8. Although there has recently been significant survey effort in coastal waters, the lack of modern data on waterbirds in offshore areas is noted. Developers need to be aware that access to adequate data on waterbird distribution and abundance is a prerequisite to effective environmental management of activities for example in timing of operations and oil spill contingency planning.

- 8.1. BWEA agree with this recommendation. The Round 3 zonal programme will enable assessment over a wider area than with individual project EIAs. A difficulty encountered by developers is found when attempting to compare baseline bird data with the area outside of the proposed development. It would be unrealistic and unreasonable to expect developers to survey everywhere therefore it will surely fall to the Government to fund survey works outside of the Round 3 Zone boundaries.

9. There remain a number of subject areas for which the information base is limited and will need to be enhanced to support future marine spatial planning as well as project specific consenting. These information gaps include aspects of the natural world and human uses, with regional context and long-term trend data notably lacking. These gaps include:

- Seabed topography and texture. For some areas there is excellent data for example from multibeam mapping undertaken variously including by the MCA, BGS and the SEA programme, but the UK lacks a coordinated programme to marshal such data, to identify priority gaps and to find ways to fill them*
- Recent information on the distribution of fish eggs and larvae, and variability in space and time*
- Detail of bird migration patterns, and variability in space and time including flight heights in different weather conditions*
- An understanding of the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs*
- Ecology of most marine mammal species and in particular important areas for breeding, foraging and resting*
- Finer scale distribution of fishing effort, gears and catches for smaller vessels (<15m)*
- Precision on the offshore distribution of navigation (AIS data coverage typically only extends 80km from shore)*
- Effects on fishing activity in and immediately adjacent to constructed wind farms*

- 9.1. BWEA agree that marine spatial planning will benefit from further research into these areas and supports further work in this direction. We also recommend research into the ecological significance of the effects of offshore wind development. Many of the above issues are complex and spatially and temporally variable and therefore may never be understood to the levels that we would wish. It is therefore imperative that decisions can be made in the face of incomplete information or there will be a danger of "paralysis by analysis".

- 9.2. The use of a VMS system for smaller fishing vessels would aide future marine spatial planning. This would help developers and fishermen by giving

developers increased certainty when planning projects and considering important fishing grounds.

10. In areas of cold water coral reefs and other vulnerable habitats and species, physically damaging activities such as rig anchoring and discharges of drilling wastes (from hydrocarbon or renewable energy related activities) should be subject to detailed assessment prior to activity consenting so that appropriate mitigation can be identified and agreed which may include no anchoring and zero discharge.

No comment

11. For the area to the west of the Hebrides (covered in SEA 7) it is recommended that blocks west of 14 degrees west should continue to be withheld from oil and gas licensing for the present. This recommendation also applies to the deepest parts of the Southwest Approaches. This is in view of the paucity of information on many potentially vulnerable components of the marine environment, and other considerations. Once further information becomes available, the possible licensing/leasing in these areas can be revisited.

No comment

12. Potential applicants for licences in the 26th and subsequent oil and gas licensing rounds should be reminded that the expectation for facilities design will be for zero discharge of oil in produced water.

No comment

13. The Department has a central role in UK energy and climate change response policies; in recognition of the national and international focus on climate change and curbing fossil fuel emissions, DECC should seek and give consideration at both the oil and gas licensing and project consenting stages to CO2 emission reduction proposals e.g. capture and storage (rather than venting) of CO2 from gas treatment offshore.

13.1. BWEA agree with the above recommendation.

14. Efforts are (or will be) underway to identify offshore Marine Conservation Zones / Marine Protected Areas e.g. under the Marine Strategy Framework Directive, OSPAR and the Marine and Coastal Access Bill. Where the objectives of the conservation sites and renewable energy development are coincident, preference should be given to locating wind farms in such areas to reduce the potential spatial conflict with other users.

14.1. BWEA agree with the recommendation but wish to state that proposals for projects can only be considered in the context of what actually exists or has definite plans to exist. Proposals for future MCZs may not succeed and may not therefore be material considerations.

14.2. BWEA would also like to note that MCZs must be designated on sound evidence-based data and the socio-economics impacts of the designations must be considered prior to designation by the competent authority. MCZs should not be influenced by landscape and visual opinions which are not evidence based. It is noted that there are no buffer zones for onshore development around Areas of Outstanding Natural Beauty.

14.3. BWEA support the stakeholder led approach to MCZ designation that will include representation from marine based industries.

14.4. Uncertainty over the effects of MCZ designation on other activities remain. BWEA understand that until the habitat or species to be protected is known, it is naturally difficult to say what restrictions on development will be required. Wherever possible, the reduction of this uncertainty is clearly in the best interests of the environment and renewable energy development.

15. Similarly, as part of the Natura 2000 initiative, further offshore SACs and extensions to SPAs are being identified. Such sites are not intended to be strict no-go areas for other activities and a number have been mooted in areas with significant potential for offshore wind farm development. Wind farm developers should be aware that SAC/SPA designation may necessitate, subject to the conclusions of any appropriate assessment, suitable mitigation measures so as to avoid adverse effects on a designated site or species.

15.1. BWEA wish to emphasise that the SEA report indicates the least constraints for renewable energy development in the Dogger Bank area. This area is also earmarked as a potential SAC.

15.2. Please also refer to comments on recommendation 14.

16. Gas storage projects need an EIA under the requirements of the EIA Directive. However, it is unclear at present under which UK regulations EIA for such projects would be undertaken, and early resolution is desirable in light of the drivers for increased UK gas storage capacity.

No comment

17. The Offshore Vulnerability Index (OVI) to surface pollutants developed by the JNCC should be reviewed in the light of results from recent aerial and boat based bird survey data, and updated if necessary. Consideration should also be given to whether the development of UK-specific individual waterbird species sensitivity indices and mapping of a Wind Farm Sensitivity Index (WSI) in UK waters would be useful in support of site selection and consenting.

17.1. WSI would need better knowledge of potential effects on birds to have any useful meaning. For example, a high WSI scoring species may be present in a development site but reality could be that any effect could be insignificant. The presence of the high WSI could raise the barrier to successful permitting without genuine good reason. Advice received by BWEA from industry is that Population Viability Assessment models for specific species would prove of more value.

17.2. It should also be noted that seasonal restrictions on windfarm operation are very unlikely to be economically feasible and must therefore be considered to be unrealistic.

18. The existing initiatives to develop waterbird Population Viability Analysis for sensitive species should be progressed, including, if necessary, research to improve the accuracy of inputs to the models.

18.1. BWEA agree that this should be a priority for the Government, possibly in collaboration with The Crown Estate and industry. This work is likely to take a long time and although useful for informing future development it cannot be allowed to delay projects.

19. The potential for capacity extensions to existing Round 2 wind farm leases requires careful site specific evaluation since significant new information on sensitivities and uses of these areas

is now available (see also recommendation 2 above). As a general rule it is recommended that any such site extensions are to the seaward rather than the landward side. Round 1 sites are closer to the coast and it is anticipated that the majority would not be extended; any application for this would also require detailed site specific evaluation.

19.1. The general rule that site extensions are to the seaward side, or any specific side, should be flatly ignored by Government. Extensions, as with all development, would require detailed site specific evaluation. There is no justification for a general rule of this nature.

20. Siting and consenting processes for offshore wind farms must remain flexible to allow for technological innovation, including in mitigation measures.

20.1. Agreed. It is of utmost importance to allow sufficient flexibility to optimise renewable energy generation.

21. The information collected by offshore renewables and oil industry site surveys and studies is valuable in increasing the understanding of UK waters. The initiatives such as the UKDEAL, COWRIE and UK Benthos databases to ensure that such information is archived for potential future use should be continued and actively promoted during the consenting processes. Similarly, there should be encouragement for the analysis of this information to a credible standard and its wider dissemination.

21.1. BWEA agree with this recommendation and note that The Crown Estate lease requires environmental data to be submitted for public release.

22. It is recommended that in certain key areas of marine mammal sensitivity, operational criteria are established to limit the cumulative pulse noise "dose" (resulting from seismic survey and offshore pile-driving) to which these areas are subjected. This could be implemented within the existing regulatory framework for activity consenting, but will require a mechanism to facilitate the exchange of information, for example through a web-based forum hosted by DECC, JNCC or the MMO when established, with suitable links to all parts of the UK.

22.1. As mentioned previously, the issue of cumulative noise must include other marine based industries as well as oil and gas and renewables.

22.2. Restrictions on wind farm construction must be considered in the full view of the safety, practical and cost effects they have on the wind farm. For example, weather windows for installation work offshore dictate short periods of time that are safe to work within. Further restricting installation times will ultimately delay delivery of renewable energy in the UK.

23. To assist developers and the achievement of conservation objectives, DECC and others in Government should encourage the adoption of consistent guidance across the UK on the implementation Habitats Directive requirements, for example disturbance of European Protected Species (Annex IV species).

23.1. BWEA agree with this recommendation and suggest that it should be progressed with urgency. UK guidance should be in line with European Commission guidance work which is currently underway.

22 April 2009

President Ben Fogle Chief Executive Kathy Moore

6-7 Barnard Mews London SW11 1QU
Telephone 020 7924 4077
Fax 020 7924 5761
Email info@cnp.org.uk
Web <http://www.cnp.org.uk>

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

By email: sea.2009@berr.gsi.gov.uk

Dear SEA team

Offshore Energy Strategic Environment Assessment Consultation

The Campaign for National Parks (CNP) welcomes the opportunity to respond to the above consultation. CNP campaigns to protect National Parks for the benefit and quiet enjoyment of all.

National Parks

CNP supports the Environmental Report's overall commitment to reducing the environmental impacts of offshore energy developments. Offshore developments that are not located appropriately would have an adverse impact on those National Parks with boundaries on or near to the coast. These areas are enjoyed for their openness and natural beauty and the presence of large scale development near to National Park coastlines would conflict with the statutory purposes of National Parks. DECC and other relevant authorities have a statutory duty to take National Park purposes into consideration when making decisions that could affect the National Parks.¹

Whilst the report makes several references to the landscape/seascape sensitivities of designations such as National Parks, CNP would like to see a stronger commitment to ensuring that no offshore energy developments are permitted that would harm the visual amenity and public enjoyment of National Park coastlines.

Coastal buffer zone

CNP welcomes the report's recommendation that the standard distance of any offshore energy developments from the coastline should be increased to 12 nautical miles and that there is the option to increase this distance if necessary. We understand that distances will have to be considered on a case by case basis, but if the proposal in the above paragraph is not accepted, we would welcome the assurance that developments would not be permitted closer than 12 nautical miles in coastal areas surrounding National Parks.

¹ Section 11A(2) of the 1949 Act as amended by section 62(2) of the Environment Act 1995 requires all relevant authorities performing any function in relation to, or so as to affect, land in a National Park to have regard to National Park purposes.

Cumulative impact of offshore energy developments

CNP agrees that the assessment of the cumulative impact of offshore energy developments must take onshore energy developments and proposals into consideration. This is essential given the increasing number of large scale onshore wind energy developments proposed near to National Park boundaries, which although outside the boundaries have the potential to have an adverse impact on the setting of the National Parks. Consideration also needs to be given to the impact of other energy-generating developments that might be located on or near to coastlines, for example the potential new nuclear energy sites proposed in Cumbria and the implications that these would have for the Lake District.

Infrastructure relating to offshore energy developments

CNP would like to reiterate the need to give adequate consideration to the onshore implications of potential offshore energy developments. If such developments are located near to National Parks then the required infrastructure such as additional roads, substations and transmission lines to connect to the national grid, could have a detrimental impact on the landscape and public enjoyment of the Parks. Although the impacts of onshore developments will be considered by the land use planning system, CNP suggests that it would be helpful for the SEA to recognise this matter.

Regional SEAs

The Regional SEAs recognise the value of the coast for many areas including National Parks. However, there is no clear indication of what this means for the location of offshore developments in practice. As stated previously CNP would like to see strengthened guidelines for offshore energy developments in the vicinity of National Parks, all of which should be considered as high sensitivity areas.

National Park Authorities are well placed to provide information about the possible adverse impacts of offshore developments on National Parks and must be consulted when any offshore energy proposals are proposed close to their boundaries.

Please do not hesitate to contact me should you require clarification of any of the above.

Yours sincerely



Amy Peters
Policy Researcher
amy@cnp.org.uk



Campaign to Protect
Rural England

**Offshore Energy Strategic Environmental Assessment
A CPRE submission to the Department of Energy and Climate Change**

April 2009

Introduction

1. The Campaign to Protect Rural England (CPRE) welcomes the opportunity to comment on the Department of Energy and Climate Change's Offshore Strategic Environmental Assessment. It is clear that offshore energy resources, particularly offshore wind, will need to be exploited to reduce UK greenhouse gas emissions, and CPRE supports the Government's desire to generate more renewable energy from offshore wind. However, we believe that new opportunities for offshore energy development should not come at the expense of highly valued landscapes and seascapes, and in this context, we welcome the recognition that major offshore wind farms should normally be sited outside a 12 nautical mile buffer zone.

General Comments

2. Views from land over the sea are an integral part of a coastal landscape. Coastal waters and the coastline are indivisible, both in terms of the natural processes at work which create the coastal morphology and in terms of the visual integrity of land and sea when viewed from land. Coastline viewed from the sea or from islands is similarly indivisible from its marine setting.

3. The United Kingdom Government has shown the importance it attaches to the concept of landscape by ratifying the European Landscape Convention. English Heritage has also conducted a Historic Characterisation of Seascapes similar to its Historic Characterisation of Landscapes. Just as our finest terrestrial landscapes are designated as National Parks and AONBs, so our finest seascapes, including the marine dimension of our nationally protected landscapes on the coast, should be protected. CPRE is pursuing this through the current Marine Bill by supporting amendments to ensure that Marine Conservation Zones can be designated grounds of their natural beauty or cultural, archaeological or geological heritage.

4. We welcome the recognition in Appendix 3c of the effect that offshore infrastructure may have on designated areas onshore. We also welcome the recognition that "over 60% of the UK public regarded the countryside as a vital component to their quality of life" and that "experience of the countryside is an important seasonal relief." Much of our coastline is mapped as being particularly tranquil using the mapping technique established by CPRE in 2006 and endorsed by Natural England. The experience of tranquillity on the coast is strongly determined by the seascape. Defra's own research show how central tranquillity is to peoples' enjoyment of the countryside

5. For many people, the clearest and most relevant manifestation of the marine environment is the view of it from land or from the surface of the sea. CPRE believes that the understanding of the sea and its wildlife is in large part informed by the experience of the view of the sea and its coastline. This is not to say that seascapes are defined simply by the view. They embrace not only the natural world as expressed in terms of biodiversity and physical features but also the human world in terms of the historic and cultural heritage, opportunities for recreation and enjoyment of beautiful scenery, and the connections and associations between them. There is a very substantial literature and body of poetry and art related to the coast and seascapes which is at the heart of the expression of British identity and also a valuable contributor to our tourism. Natural England has acknowledged this in its

objectives for enhanced coastal access in the Government's Marine Bill which CPRE strongly supports.

6. CPRE considers that the definition of what constitutes 'major' offshore wind development is a vital and urgent question. A distance of 12 nautical miles is, in our view, satisfactory for very large scale turbine installations seen from sea level or low ground level. But in the case of important views from higher elevations such as Hartland Point in north Devon (c 100m asl), or Tennyson Down on the Isle of Wight, for instance, longer exclusion distances may be justified. CPRE is encouraged by the careful consideration of coastal atmospheric conditions in the consultation as well as the question of 'horizon crowding'. In our view, these issues need a range of threshold distances to be established.

7. The high value that the public places on seascapes, we believe, warrants comprehensive landscape assessments of coastal areas adjacent to regional seas 1, 2, 3 and 4, prior to the development of Round 3 offshore wind farms and CPRE looks forward to contributing to these.

CPRE
April 2009

Offshore Energy SEA Consultation
The Department of Energy and Climate Change (DECC)
4th Floor Atholl House
86-88 Guild Street
Aberdeen, AB11 6AR
E-mail: sea.2009@berr.gsi.gov.uk

Centrica Renewable Energy Limited
1st Floor Millstream East
Maidenhead Road
Windsor
Berkshire SL4 5GD
www.centricaenergy.com/renewables

BY EMAIL ONLY

Our Ref: GE-G-CR-001-000000-004-L

21st April 2009

Dear Sir / Madam,

UK Offshore Energy Strategic Environmental Assessment January 2009 – Centrica Response.

Centrica welcomes the opportunity to respond on the Department for Energy and Climate Change's Offshore Energy Strategic Environmental Assessment (SEA) consultation, and is involved in a number of offshore interests that would be affected by these proposals.

Centrica's principle upstream operations include the operation of power generation assets, energy trading, gas production, and operation of renewable energy assets. Centrica also supplies energy to residential and business customers in the UK through its retail subsidiaries, British Gas and British Gas Business.

This response is predominately focused on impacts from an offshore wind perspective, since the proposals in the SEA are likely to have greatest impact on our future wind developments. Centrica has strong experience in this field and is currently investing in six offshore wind farm developments, three of which are now operational, and also hopes to be involved in the future Round 3 developments. Hence this response summarises our views predominately in relation to future offshore renewable projects.

General Comments on the SEA

The UK has been set challenging targets for renewable energy generation, including the EU legally binding target to ensure that 20% of all energy will be generated from renewable sources by 2020, with a UK specific target of 15%. Centrica believes the Government therefore needs to take a key role in facilitating and resolving the conflicts between oil and gas, commercial shipping, and the fishing industry in order to meet the 2020 targets and push forward renewable energy generation. Furthermore, if the SEA is delayed we believe this will only delay progression towards these targets.

Centrica feels it is unfortunate timing to conduct the SEA during the bid submissions for The Crown Estate Round 3 tender, in case the outcomes of the SEA result in changes to any of the zone boundaries after the developers have submitted their bids. We feel it would have been more productive to finalise the SEA before bids were required to be submitted to The Crown Estate.

Centrica also feels that in certain sections the language in the SEA should be reviewed, particularly with reference to landscape and visual assessment, and the general presumption that wind farms have a negative impact on landscape, tourism, recreation and quality of life. We believe these issues are subjective and this presumption should not run as a theme throughout the SEA. The offshore wind industry also appears to be treated as a lower priority than other industries where the issue of spatial planning conflict arises.

There is also a clear conflict with comments made regarding a 12 nautical mile buffer zone and the Scottish Territorial Waters (inshore) round of wind farm developments within the 12 nautical miles that needs to be clarified.

Centrica also believes there is uncertainty as to how the SEA report will be used by the Government to translate into policy, in particular the National Policy Statements for renewable energy, and therefore requests that greater clarity is provided on this issue.

Shipping

The SEA contains some good baseline information; however Centrica has a number of concerns regarding the recommendations and interpretation of the shipping data in particular. We believe the shipping data used in the SEA (four weeks worth) is too small a dataset to make any detailed recommendations, particularly in respect to sterilising areas for wind farm development. We also believe that the types of shipping that will be impacted upon have not been analysed, and it also appears that large areas of the sea have been excluded from the research.

We would recommend that shipping restrictions should be dealt with on a case-by-case basis using datasets of longer periods, using input from stakeholders, and an understanding of the movements of vessels in periods of bad weather. We recommend that the baseline information gathered under this SEA is not the same method going forward for further SEA rounds.

Comments on the Environmental Report

Below are comments on most of the recommendations made on pages 213-217.

- *Recommendation 1*

This recommendation discusses coordination of renewable energy leasing and licensing for oil and gas in order to minimise potential sterilisation of areas for other industries. However, it appears the SEA states that offshore wind can be effectively sterilised by other industries as detailed in Recommendation 2. Further clarification is sought regarding this premise. There is no legislative basis for offshore wind farm development to be treated in a non-equitable way.

For Government targets to be met, a unified Government departmental approach needs to be effective immediately. Conflicts between the major users of the sea will require clear decision making and resolution from Government going forward.

This includes:

- oil and gas priority
- shipping

- *Recommendation 2*

We request clarification on the economic bias toward tourism. Centrica believes that this particular factor should not be used as a presumption against wind farm developments, nor should recreation or quality of life. The SEA overall presumes a negative bias toward offshore wind rather than a neutral bias. There has been no evidence given to suggest that wind farms are detrimental to tourism, recreation and quality of life. Many of the onshore studies suggest the opposite. Centrica would therefore suggest that these presumptions are removed from the SEA or clarified by further work.

We would also like to make the point that Centrica considers itself a responsible wind farm developer, and invests significant time, resources and funds to research and survey its sites to understand the potential environmental impacts. We are also actively working with organisations (such as JNCC) that wish to use our data to inform their own studies.

- *Recommendation 3*

The 'precautionary approach' mentioned here requires some clarity on its use in the SEA and the direction that the Government will take. As the ecological points such as marine mammal and seabird foraging areas are known to shift and change due to the complexity of the marine environment (nutrient upwelling, etc), this particular recommendation should be reviewed.

Since ecosystems are complex matters, we believe the SEA should not look to impose a hard constraint such as the precautionary approach, on such aspects that are not spatially and temporally fixed.

- *Recommendation 4*

The report recommends that "the bulk of new generation capacity should be sited well away from the coast, generally outside 12 nautical miles." Centrica would welcome the assurance that such a limitation of 12 nautical miles would not be imposed on developers and that the matter of landscape and visual assessment is dealt with on a case-by-case basis at the EIA stage. It would also be useful to understand the definition of 'the bulk of' new generation capacity, and how much exactly this relates to.

The SEA also appears to presume a negative association here with offshore wind turbines, and in addition is the overall concern as to how this recommendation will be interpreted by other stakeholders with concern for some of the affected Round 2 and Round 3 planned wind farm sites.

- *Recommendation 5*

Engineering and construction constraints and alternatives will be dealt with during detailed Environmental Impact Assessment studies on a case-by-case basis and will involve best practice but not at uneconomical costs or at the compromise of health and safety procedures.

- *Recommendation 6*

Further clarity will be required on the Government's approach to Appropriate Assessments and how it intends to impose the precautionary principle. Is the recommendation suggesting that the Appropriate Assessment will be conducted on the Round 3 zones or is it referring to the case-by-case assessment that will occur at the EIA stage?

- *Recommendation 7*

This recommendation could be closed out with guidance from Government agencies. Centrica supports the idea of a web-based forum to facilitate the exchange of information. The organisation most likely to run this effectively is the JNCC with further funding from the Government.

- *Recommendation 8*

Agencies and major stakeholders such as the RSPB need to formulate early guidance on the detail of the studies expected for Round 3 and the zones. It is recommended that the Government facilitate discussions with stakeholders to ensure the appropriate guidance is given during the scoping period.

- *Recommendation 9*

The statement in paragraph one reads that there are a number of subject areas for which the information base is 'limited' and contains 'information gaps', however, this appears to conflict with the statement on page 217 which states that "This existing monitoring activity.....to date has been found adequate" and hence further clarity should be provided.

- *Recommendation 14*

This recommendation is unclear and further clarity is required, particularly under what instances the objectives of a conservation site and a renewable energy development would be coincident, and what is

meant by giving preference to locating wind farms in such areas to reduce spatial conflict with other users.

Centrica would like to make the further point that Marine Conservation Zones should consider the socio-economic impacts before they are designated, and should not be influenced by landscape and visual aspects which are, as stated previously, a subjective matter.

- *Recommendation 17*

Centrica would like to make the point that whilst interpreting the results of such studies, any seasonal restrictions on wind farm operation would be very unlikely to be economically feasible and should be considered unrealistic as a potential proposal.

- *Recommendation 18*

It is not understood why Population Viability Analysis is singled out and why the recommendation is limited to one particular method of analysis. Centrica believes the recommendation should be broader and encompass guidance and research on a variety of methods. Further clarity should be provided in the SEA or amended to encompass other methodologies, but should not delay future projects.

- *Recommendation 19*

Centrica believes this recommendation should not presume that landward extensions are not possible. We welcome the opportunity to extend capacity on constructed sites, but believe extensions would need to be dealt with on a case-by-case basis, with the consenting regime for these considered also. No justification for a general rule exists since constructed projects many not necessarily have the potential for spare capacity.

- *Recommendation 21*

Centrica supports this recommendation, and welcomes such research, but would like to make the point that survey data and research collected by developers during the development of offshore wind projects can be of commercial confidence and of high monetary value to the developers that collected it. We therefore would welcome developer involvement in agreeing how the data is used and what confidential measures are placed on the data before it is provided.

- *Recommendation 22*

Centrica supports this recommendation. We suggest the expertise lies within JNCC to facilitate the web-based forum. However, JNCC will need additional funding to carry this out and the Government should recognise this.

- *Recommendation 23*

Centrica would like to make the point that new designations should be discussed and engaged upon with affected developers as soon as they are identified.

If you require any further clarification on this response please don't hesitate to get in touch,

Yours sincerely,

Maria Scarlett
Round 3 Development Manager

Tel: 01753 492 649

Email: Maria.Scarlett@centrica.com



Delivering for Britain

The Chamber of Shipping
Carthusian Court
12 Carthusian Street
London EC1M 6EZ
Direct dial +44 (0)20 7417 2828
Fax +44 (0)20 7726 2080
E-mail : saurabh.sachdeva@british-shipping.org
Internet www.british-shipping.org

To
Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

By email: sea.2009@berr.qsi.gov.uk

20 April 2009

Dear Sir,

UK Offshore Energy Strategic Environmental Assessment (EIA) Consultation

I am responding on behalf of the Chamber of Shipping which is the trade association for UK based ship owners and ship managers. With 137 members and associate members, the Chamber represents approximately 860 ships of about 23 million gross tonnes and is recognised as the voice of the UK shipping industry. This response reflects the consolidated view of our members representing diverse range of operational shipping interests.

Having read in detail the SEA consultation report on offshore wind energy and offshore oil and gas, the Chamber of Shipping is pleased to say that most of our concerns have been highlighted in the SEA report findings. In our view comprehensive coverage has been given to the issues that impact shipping operations, services, routes and businesses competitiveness in the UK. In short the Chamber supports the Government's initiative to meet energy commitments to generate more renewable energy by 2020. But, we are also keen to emphasise that the key to handle offshore renewable development process also lies with the fact of striking a right balance between the valuable opportunities and the potential threats.

The overall aim is to achieve a position whereby offshore renewable energy proposals are facilitated without merchant shipping interests being either advantaged or disadvantaged by their development. Given the diversity of ships and routes on which they are employed no single formula or regional approach is likely to be suitable for all the proposed sites. Obviously, our main concern in responding to this SEA report is to ensure that shipping interests are not jeopardised or neglected in order for the Government to achieve its renewable energy targets, especially if this results in disruption to the existing shipping lanes.



Our case is further strengthened by the fact that one of the key recommendation in the SEA report states that “*wind farm citing should be outside areas of important for navigation (these are mapped in the Environmental Report) and that this would not preclude the attainment of the draft plan/programme objective*”. It is our intention to engage in a positive and an early dialogue with the offshore wind farm developers (once awarded) and provide appropriate information, guidance and suggestions to mitigate the navigational risks related to shipping traffic, density, safety and commercial routing.

Some of the key recommendations in the report which we find particularly welcoming are listed below;

- a) scope of development outside the 12 nautical miles,
- b) to set up a coordinated approach for future developments,
- c) establishment of buffer zones, and
- d) measures to avoid disruption and deviation to normal commercial shipping traffic, routes and lanes.

However, we would like to add one further comment with regards to the cumulative impact assessment process. In our view the current process needs to provide alternative options or measures that other sea users should adopt to mitigate navigational risks that might be posed as a result of a proposed development.

In suggesting these measures, the report should clearly indicate potential and existing developments in the vicinity and a comprehensive risk assessment. This assessment should include the extent of any deviation for shipping (if at all applicable) and the consequences of it on the routes commercial viability. If, for any reason, shipping is forced to deviate from the existing route as a result of an offshore development being consented then a suitable compensation should be payable and this off course being subject to an impartial assessment.

The Chamber appreciates the key sensitivities and concerns that might arise as a result of implementing the findings and recommendations of the SEA report and therefore it is prudent to suggest that the same should be consistently applied across the border in view to achieve a level playing field for the other sea users. Finally, we hope that the potential offshore renewable developers in future will conduct a comprehensive navigation risk assessment that would incorporate the recommendations made in the SEA report and our response.

In conclusion, we support the tenet of the offshore Energy SEA and hope that these comments are useful.

Yours sincerely

A solid black rectangular box used to redact the signature of the sender.

Captain Saurabh Sachdeva

Nautical Consultant
The Chamber of Shipping, London



Cyngor Cefn Gwlad Cymru Countryside Council for Wales

CADEIRYDD/CHAIRMAN: JOHN LLOYD JONES OBE

PRIF WEITHREDWR/CHIEF EXECUTIVE: ROGER THOMAS

Anfonwch eich ateb at/Please reply to:

Keith Davies - Cyfeiriad Isod/Address Below
Llinell Union/Direct Line: 01248 387285 Ffacs/Fax: 01248 385511
Ebostr/Email: k.davies @ccw.gov.uk

Dept. of Energy and Climate Change
4th Floor, Atholl House
86-88 Guild St.
Aberdeen
AB11 6AR

email: sea.2009@berr.gsi.gov.uk
FAO: Kevin O'Carroll – Head of Environmental Policy Unit

22nd April 2009

Dear Kevin

CCW Comments on the UK Offshore Energy Strategic Environmental Assessment Environmental Report

The Countryside Council for Wales champions the environment and landscapes of Wales and its coastal waters as sources of natural and cultural riches, as a foundation for economic and social activity, and as a place for leisure and learning opportunities. We aim to make the environment a valued part of everyone's life in Wales.

Thank you for consulting the Countryside Council for Wales on the Offshore Energy SEA Environmental Report. The CCW is the Government's statutory advisor on sustaining natural beauty, wildlife and the opportunity for outdoor enjoyment in Wales. CCW was created by the Environment Protection Act 1990 to provide advice on nature conservation, landscape and recreational matters throughout Wales and in Welsh waters out to 12 nautical miles of the coast. Our comments are made in the context of CCW's role as consultant body under the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004.

As you are aware CCW have contributed to the SEA process as members of the steering group and contributors to stakeholder workshops. We also provided comments at the SEA scoping stage. CCW places great importance on engaging with the SEA process and welcomes the structured and open way in which participation has been managed and commends DECC on the comprehensive and rigorous approach it has adopted in carrying out this assessment.

In summary, CCW supports the overall conclusion of the SEA that alternative 3 to the draft plan or programme is the preferred option, with the area offered restricted spatially through the exclusion of certain areas. CCW also agrees with the conclusion that the bulk of new generation capacity should be located well away from the coast, generally outside 12 nautical miles.

However, we have a number of concerns about aspects of the SEA, in particular about the scope of the SEA, the need for a more efficient and coordinated approach to the strategic assessment of marine energy



Gofalu am natur Cymru - ar y tir ac yn y môr • Caring for our natural heritage - on land and in the sea

Prif Swyddfa/Headquarters

MAES-Y-FFYNNON, PENRHOSGARNEDD, BANGOR LL57 2DW FFÔN/TEL: 01248 385500 FFACS/FAX: 01248 355782

<http://www.ccw.gov.uk>

development and the level of support SEA provides to subsequent decision-making. CCW raises these concerns here to help improve future strategic assessments that may be undertaken for large scale marine energy development. CCW has also identified a number of weaknesses in the report that should be addressed before finalising this assessment and prior to subsequent offering of areas for development.

We have therefore provided general comments on the Offshore Energy SEA process, general comments on the Environmental Report followed by more detailed comments on the detail of the report contained in an annex to this letter.

General Comments on the SEA process

Scope of the SEA and consideration of alternatives

1. The report states that ‘the draft plan or programme subject to this SEA needs to be considered in the context of overall UK energy supply policy and greenhouse gas emissions reduction efforts. The main objectives of the current plan/programme are to enhance the UK economy, contribute to...carbon emission reductions and security of energy supply’. However, the plan as described by the report and that is subject to this SEA is only based on elements of the energy generation infrastructure that might contribute to the achievement of this objective; a number of potentially significant elements sit outside the plan and therefore the SEA (e.g. the Severn Tidal Power Project and other wave & tidal stream development). As we stated in our comments on the scoping of the SEA in February 2008, CCW are concerned that by considering only selected elements of offshore energy generation, DECC have limited the assessment of alternatives and therefore risk failing to fully assess the environmental effects of the stated overall objective of the plan/programme.
2. We advise that an assessment of the risks and benefits of a more comprehensive range of energy generation alternatives is needed to provide a more robust evaluation of the overall environmental risk associated with UK energy supply policy.
3. The SEA might also have considered potential conflicts between future energy generation activities, for instance, whether oil and gas licensing should be ruled out in some blocks to provide space for renewable energies to be built.

Reducing risks and providing greater certainty

4. Given the amount of evidence gathered by the assessment and evaluation undertaken during this SEA, CCW considers that the report should have provided greater certainty by going further in identifying areas that may or may not be suitable for offshore windfarm development (OWF).
5. The recommendation of the report that OWF development should take place beyond 12 nautical miles provides only a very approximate guide to developers and fails to provide the certainty necessary to facilitate timely decision-making required (by the IPC) to allow projects to proceed at a pace consistent with that needed to meet renewable energy targets. Whilst we agree with the general conclusion that sensitivities increase significantly in close proximity to the coast and that, in general, development should take place beyond 12 nm as sensitivities fall away, we believe the spatial constraints mapping

work outlined in Section 5.7.2 should have gone further to identify more precisely those areas that might or might not be suitable for OWF development (both inside and outside the 12 nm boundary).

6. CCW is aware of the approach taken by The Crown Estate to identify what it considers to be areas that may be suitable for OWF development. CCW was not consulted during the process of identifying these areas and cannot therefore comment on their suitability from an environmental perspective. However, we consider that such an approach, informed by the wealth of information and evaluation gathered by the SEA, has the potential to bring a much needed focus to the search for, and debate about suitable locations.
7. It is important that any process of identifying indicative areas is based on data and methods that are appropriate. CCW believes that the process of identifying and publishing information about specific areas (including maps) should take place but that this process should take place within an SEA and be subject to open discussion and agreement between government, statutory advisors, developers and other users. This would result in greater certainty which in turn would facilitate more rapid deployment and so increase the likelihood of achieving energy targets.

Efficient engagement with marine energy assessment processes

8. CCW considers that there is a need for better coordination between assessments of marine energy plans and programs across the UK to ensure that best use is made of resources available to regulators, advisors and developers.
9. The issue of under-resourced statutory advisors becoming a bottleneck in the energy consenting process has frequently been highlighted not only by the advisors themselves but also by developers and The Crown Estate. Notwithstanding the need for government advisors to be suitably resourced, an approach to SEA that provides for more precise identification and agreement of areas suitable for OWF development (as outlined above) should be pursued until such time as a formal system of multi-sectoral marine spatial planning provides for this. This would represent a more efficient process that would allow statutory advisors to engage more effectively at a strategic level and so reduce (although not eliminate altogether) the level of commitment required at the project level.

General Comments on the Environmental report

Evaluation of the effects of gas storage and oil and gas activity

10. In general the evaluation contained within the Environmental Report, perhaps understandably, focuses very much on the implications of offshore windfarm development. However, gas storage is a new technology that is not well understood and, whilst there is little information about its potential impacts that can be evaluated within this document, the SEA should have provided more comprehensive recommendations for improving the knowledge base in relation to this activity. This is of particular importance in light of DECC's current consultation on the proposed offshore gas storage and gas unloading licensing scheme, which states that "the Government is committed to introducing the licensing scheme as soon as possible in order to ensure that new infrastructure can go ahead and contribute to the security of energy supply in the UK". It is therefore likely that gas storage (and

unloading) infrastructure will be allowed to develop in the coastal waters in the near future. Greater understanding of the environmental impacts of this new activity, alone and in combination with offshore windfarm and other development, is urgently needed.

11. Furthermore, although the potential effects of oil and gas activity are well understood and so can be effectively mitigated against in many circumstances, robust evaluation and regulation are still essential if significant impacts are to be avoided. In places, notably Section 5.5, the report should have evaluated the potential effects of oil and gas activity more comprehensively (or refer to where such evaluation has been previously undertaken). This and future SEA's should continue to provide comprehensive assessment of oil and gas activities.

Landscape implications

12. The report fails to include sufficient information on the likely significant effects on landscape/seascape of the plan/programme. For example there is no evaluation of short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative effects, or of the effects of oil and gas infrastructure on landscape/seascape. The report appears to focus only on the direct impacts of wind turbines - once erected - on the visual resource. Thus the requirement of the SEA Regulations, to identify measures to prevent, reduce and, as far as possible, offset any significant adverse effects of implementing the plan/programme are unlikely to be met.
13. The definition of seascape is limited to visibility and views and needs expanding so that effects on seascape character can be considered too. Since the UK government signed and ratified the European Landscape Convention, the following definition is increasingly used: "An area of sea, coastline and land, as perceived, whose character results from the actions and interactions of land and sea, by natural and/or human factors". The definition of seascape and other relevant terms should also be included in the Glossary.

Impacts of coastal and terrestrial infrastructure

14. The supporting study on the need for onshore transmission concluded a need for reinforcement of grid infrastructure in north-west Wales. Although the Environmental Report describes the potential impacts in general terms it is not clear whether or how this has been considered within the mapping of spatial constraints.
15. Furthermore, the potential effects of energy development on sites designated for the protection of biodiversity focuses strongly on the risks to European marine sites. However, there is a need to recognise the potential implications for other protected sites (e.g. SSSI's) and biodiversity (e.g. UK BAP species/habitat) designated under the Wildlife & Countryside Act 1981 and Natural Environmental & Rural Communities Act 2006 (notably Appendix A3j.6 that covers 'UK Biodiversity Action Plans' is very out of date). These resources are of particular relevance in the consideration of the landfall and wider terrestrial impacts of energy developments.
16. The report also fails to consider the effect (direct and indirect) of terrestrial infrastructure on views and on landscape character and sensitive receptors.
17. It seems likely, therefore, that the terrestrial/coastal effects of OWF development may have been underestimated.

Reliance on mitigation

18. As understanding of the effects of marine energy activity has developed, especially in relation to oil and gas, so has our ability to employ robust mitigation to avoid significant impacts. This also includes mitigation developed to minimise the effects of OWF during Rounds 1 and 2. However, Round 3 is likely to result in development at a much greater scale and the report should contain a recommendation for a comprehensive review of the adequacy of existing mitigation (eg. in respect of combined effects of piling noise).

Information about the Welsh marine environment

19. CCW has recently undertaken a number of information gathering exercises that provide better resolution of the environmental baseline in Wales. Firstly, the HABmap project has completed detailed assessment of the sea bed and work continues in order to improve the geographical coverage of this study.
20. Secondly, information about marine mammal distribution in the Irish Sea will shortly be published which incorporates new data and provides an assessment of the distribution of key mammal species at a higher resolution than was previously available. This new information should be taken into account prior to finalising the Environmental Report.
21. Finally, since the draft Environmental Report was published for consultation CCW has also published detailed regional assessments of seascape character including an assessment of sensitivity to marine energy developments¹. This study represents an important step forward by providing a rigorous and robust process for characterising seascape and assessing impacts of activities upon it.

Potential Benefits of OWF development

22. The possible benefits of OWF development to the local environment are not well understood from either a technical or policy perspective. It may be that the environmental benefits of such technologies may act to counterbalance some of the impacts within or close to the footprint of developments and that important resources can co-exist with renewable energy development. However, this concept is not well understood and further investigation is necessary to support proposals for such arrangements (as suggested in Recommendation 14).

Evolution of the baseline – future conservation sites

23. Whilst the location, extent and features of future conservation sites (such the Marine Conservation Zones proposed in the Marine & Coastal Access Bill) remains uncertain, the potential for impacts on these sites should be recognised more clearly in the main body of the report, and particularly in Section 4.2 that describes the likely evolution of the baseline.

¹ Briggs, J.H.W. and White, S. (2009). *Welsh seascapes and their sensitivity to offshore developments*. Countryside Council for Wales. CCW Policy Research Report No. 08/5



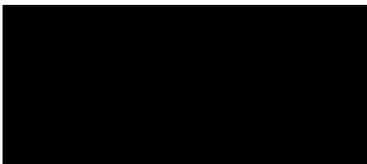
Cyngor Cefn Gwlad Cymru Countryside Council for Wales

Links with wider UK data management policy and process

24. The report recommends the continued use and further promotion of information management initiatives such as UKDEAL, Cowrie, UKBenthos etc (Recommendation 21). There needs to be effective consistency and coordination with UK wide data management policy and processes such as those covered by the Marine Data Information Network (MEDIN).

CCW hopes that you find these comments useful in finalising the SEA and moving towards offering areas for development. If you would like to discuss any of the points we have raised please contact either Andrew Hill or John Hamer in the first instance.

Yours sincerely



Keith Davies
Head, Environmental Policy Group



Gofalu am natur Cymru - ar y tir ac yn y môr • Caring for our natural heritage - on land and in the sea

Prif Swyddfa/Headquarters

MAES-Y-FFYNNON, PENRHOSGARNEDD, BANGOR LL57 2DW FFÔN/TEL: 01248 385500 FFACS/FAX: 01248 355782

<http://www.ccw.gov.uk>

Annex 1. Detailed comments on the Environmental Report

Section 4. Environmental Information

Subsection 4.4. Likely Evolution of the Baseline

The section on marine mammals should also highlight the fact that distribution is strongly affected by food availability, abundance & distribution.

Section 5. Assessment

5.2.1 Sources of potentially significant effect

Box 5.1: Bird collision risk is considered to be a significant factor but not the potential for attraction to and collision with oil and gas platforms. Although this issue has been identified as a potential physical effect in Section 5.5.1, only the evidence in relation to collisions with windfarms receives any further consideration. Further evaluation of the evidence in relation to oil and gas platforms should be undertaken before concluding whether or not it is a significant factor (which CCW considers it can be).

5.3.6 Summary of findings

CCW is concerned that the areas of key mammal sensitivity identified in the report are not sufficiently comprehensive and do not seem to be closely based on the available evidence, either the evidence described in the report itself or elsewhere. It is essential to correctly identify these areas if measures are to be selectively applied to them but not elsewhere. We have identified below those areas and species, in addition to those described in the report, which we consider to be of particular importance in waters around Wales (Regional Sea areas 4 and 6).

NW-NE Anglesey

This area is important for bottlenose dolphins (as described in the report Pesante *et al*, 2008 which is listed in the reference section of the Environmental Report) and is also important for harbour porpoise, Risso's dolphin and grey seal.

Lleyn Peninsula

Grey seal, harbour porpoise and Risso's dolphin should be included.

Cardigan Bay

Grey seal and harbour porpoise should be included.

Pembrokeshire

Grey seal, harbour porpoise, Risso's dolphin, common dolphin, and minke whale should be included.

Celtic Sea

Minke whale should be included.

Carmarthen Bay

Harbour porpoise and grey seal should be included.

5.5.3 Spatial considerations

Figures 5.19 & 5.20: These two maps are both based on ESAS data. The legend indicates that these maps are based on data sourced in 2004. Survey work has since been undertaken (on behalf of BERR/DECC) in some areas for which there was previously poor survey coverage (eg Cardigan Bay). We suspect that these maps should be updated to include the more recent information.

Table 5.5: In relation to Regional Sea areas 4 and 6, Manx shearwater should be identified as being potentially at risk of collision (given that the risks are identified as 'unknown' in Table 5.4). For Regional Sea 6, gannet, of which there is a major colony on Grassholm Island, should also be included as a collision risk. Red throated diver should be included as being potentially displaced in Regional Sea 6 as there are large concentrations of red throated divers in the northern area of Cardigan Bay.

5.5.4 Cumulative impact considerations

5.5.4.1 Birds

There is a good possibility that significant cumulative impacts on migratory passerines are unlikely. However, current understanding is based more on our knowledge of general migration patterns, rather than sufficient hard evidence. Furthermore, much of the evaluation contained in this section draws heavily on MacLean & Rehfish, 2008. This was a draft position paper describing discussions of a workshop held that year. If possible the SEA should base its evaluation on the final report of the workshop.

5.5.5 Summary of findings and recommendations

The first paragraph of this section states "Overall the assessment outlined above concludes that the available evidence from existing OWF developments suggests that displacement, barrier effects and collisions are all unlikely to be significant to birds at a population level". We would argue that the evidence presented in previous sections does not support such a conclusion. Much of the evidence presented is circumstantial and does not prove beyond reasonable doubt that population effects can be discounted. Again, the evaluations are to some extent based on MacLean & Rehfish, 2008, the draft paper described above. If possible, the evaluation should be based on the findings of the final report. We suggest a more precautionary conclusion: that the likelihood of population level effects remains uncertain and should be considered on a case by case basis.

It is also important to recognise that assessments should also cover effects in addition to those significant at the population level, such as affects on the integrity of protected sites.

Subsection 5.6 Landscape/Seascape

5.6.1 Visibility of turbine structures from the coast

There is a need to define the concept of 'significance' (of distance offshore). Also need to state the basis of these figures (Table 5.9). They appear to be qualitative judgements, so the study needs to estimate their robustness. Intuitively, they appear to us to be too short.

Sensitivity varies between development type. Sensitivity for offshore wind farms may be different to that for other types of development. This point should be acknowledged.

5.6.4 Landscape 'value'

The Registered Historic Landscapes (unique to Wales) should be included in relation to designated landscapes. The registers are a non-statutory material planning consideration.

Reference has been made in places to the Welsh seascape assessment and calculations of 'value' have been created, based on (in summary) the percentage of the seascape unit that is designated. Please note that the final Welsh seascapes study² stops short of this, though relative levels of sensitivity are given.

CCW did not prescribe an overall level of value as it tempts 'adding up scores', which risks comparing fundamentally different things via their scores (e.g. 2 World Heritage sites does not equal a National Park). Furthermore, the European Landscape Convention reminds us that all landscapes matter, and an approach that considers who values what, where and why (at an appropriate scale), would be preferable to an approach that assumes that undesignated areas have no value.

5.6.6.6 & 5.6.6.7 Regional Seas 4 & 5, 6

See also comment on 5.6.4 above – the value scores have been included from an unpublished draft version of the Welsh seascapes study (White, 2008). Note these scores were based on the level of designation.

Subsections 5.2, 5.5, 5.8 & 5.16.

Introduced non-native species (INNS) are mentioned in relation to ballast water in these sections, however the report should also consider the added risk of the spread/introduction of INNS via rigs and other mobile construction equipment and the use by INNS of any permanent structures as stepping stones across otherwise unsuitable substrata. It should be acknowledged (perhaps in 5.5.2.5) that in certain areas there might be a risk of non natives spreading via 'stepping stones'. For instance, where an installation is mid way between two rocky areas interspersed with areas of sediment.

² Briggs, J.H.W. and White, S. (2009). *Welsh seascapes and their sensitivity to offshore developments*. Countryside Council for Wales. CCW Policy Research Report No. 08/5

Section 6. Recommendations & Monitoring

Recommendation 2

There should also be a presumption against any activity that is likely to result in a significant deterioration in biodiversity status and the quality of habitats and landscape.

Recommendation 14

It is important to optimise the use of space in the marine environment, especially given the likely scale of future marine renewable energy development. Co-locating renewable energy technologies with future or existing conservation areas may be possible, but this arrangement should not automatically be considered in preference to co-location with other developments and users. Further research is required to understand the spatial and temporal implications of co-locating renewable energy development with protected areas, both at the level of the individual site but also at the scale of the protected area network.

Recommendation 15

The recommendation states that "wind developers should be aware that SAC and SPA designation may necessitate, subject to the conclusions of any appropriate assessment, suitable mitigation measures so as to avoid adverse effects on a designated site or species". This section should also recognise that development will not obtain approval where significant adverse effects upon the integrity of any European site are anticipated unless it can be demonstrated that there are no alternative solutions to the plan or project, there are overriding reasons of public interest and that satisfactory compensation can be secured.

Recommendation 21

Initiatives seeking to provide for better management of information gathered during the assessment of energy infrastructure need to be consistent and coordinated with wider UK data management policy and processes such as those covered by the Marine Data Information Network (MEDIN).

Appendices

Below we have suggested a number of amendments to improve accuracy of the statements and to correct some errors. We suggest that the Appendices should be checked thoroughly before finalising.

Appendix 3 Biodiversity, Habitats, Flora and Fauna

3a.2 Benthos

The text in this section seems rather disjointed. Some aspects are covered in great detail whilst others are dealt with less comprehensively. In general, the clarity of the Regional Sea sections would be improved if the structure, based on habitat types, is the same for each. Where a particular habitat type does not occur the relevant section should perhaps record "absent from this Regional Sea area". We suggest the following amendments:

Page 28 – The section covering Regional Seas 4 and 5 should include a subsection on Biogenic Habitats. For instance *Sabellaria* is known to occur in the Severn and Bristol Channel area.

Page 34 – Although the sublittoral habitats and communities of the Bristol Channel and the Severn Estuary have been relatively well studied there remains considerable uncertainty about the precise distribution of subtidal *Sabellaria* reef.

Page 36 – Information from CCW's HABmap sea bed mapping project should also be referenced as an additional source of information

Page 37 –The statement that 'to the east of Tremadog Bay, the seabed is varied but dominated by current swept coarse cobbles sustaining, in places, minimal epifauna (Rees, 1993).' needs checking. It is not clear what is meant by 'east of Tremadog Bay'. Furthermore, the currents are not particularly strong on the eastern side of Tremadog Bay.

Figure A3a.2.5 - a reference should be provided for this figure

Page 39 – The phrase 'In offshore parts of Cardigan Bay, finer sediments dominate the substratum' is ambiguous as its not clear whether they mean finer than the cobbles mentioned in the previous paragraph, or finer as in fine sands (the former is generally accurate but the latter interpretation would be incorrect).

Page 40 – The statement that 'Nearshore habitats along the west coast of Wales from the Llyn Peninsula at the northern limit of the scenario to Milford Haven in the south are characterised by a mixture of sandy gravel and gravel' is a considerable oversimplification that appears to be based on BGS maps where all grain sizes in excess of 2mm are classified as 'gravel' (so includes pebbles, cobbles and small boulders) and where rock is under-represented. In reality there is a wide range of sediment and rocky habitat types which should be classed as mixed sediments that include sand, gravel, pebbles and cobbles.

Page 41 CCW disagrees with the statement that the 'coast around Strumble Head and Skomer consists of a series of bays separated by headlands characterised by a relatively impoverished fauna determined by the degree of exposure.' Strumble Head and Skomer are characterised by a number of species-rich rocky habitats. Furthermore, it is not really clear which sections of coast are described by this passage, for instance, does this also include St Brides Bay?

Page 42 – The section on Biogenic habitats should also include mention of the extensive *Modiolus* bed off the North Llyn (it wasn't surveyed as part of SEA6 as the extent was already known) and reference to *Musculus* beds.

Page 43 – Other communities of conservation importance in the Regional Sea 6 area should be included such as seagrass, oyster and maerl beds.

3c Landscape/Seascape

A3c.1 Introduction - Although visibility is a significant aspect, the definition of 'seascape' should be broader (see paragraph 13 above).

A3c.1.1 Designations - The Register of landscapes of Outstanding and Special Historic Interest (CCW/CADW) should be included. (This non-statutory material planning consideration is unique to Wales).

A3c.2 Landscapes Seascapes Background - Note that the final Welsh seascape assessment considers sensitivity but it does not define seascape 'value' and hence it also does not provide seascape 'capacity' scores.

A3c.4 Evolution of the Baseline and Issues - As a general rule, it is helpful to distinguish between changes to views and changes to the character of a place. The two are different concepts and both are relevant in seascape assessment. Although impacts from offshore wind farms are not direct impacts on the coastline or landscape, the importance of the visual aspect is acknowledged here as being especially important.

3j Conservation of Sites and Species

3j.6 Biodiversity Action Plans

This section is now considerably out of date and should be re-written. It fails to recognise that arrangements for managing BAP's are now devolved, and not UK led, and that the BAP process also now has a statutory basis provided by the Natural Environment & Rural Communities Act 2006. The UK BAP process underwent a period of review in 2005, which culminated in 2007 in a revised UK list of priority species and habitats. Individual administrations have drawn on the UK list of priority species and habitats but lists differ markedly between each country. The text and tables in this section need to better reflect the differences between the priority biodiversity and national BAP arrangements for each country. Information about Welsh BAP arrangements and relevant species and habitat lists and can be obtained from www.biodiversitywales.org.uk.

3j.7 Species Conservation

Page 596 - paragraph 3 – there is mention here of the devolved listings of habitats and species. However, it needs to be clarified that these species and habitats are not subject to UK action plans as such (each devolved country identifies action relevant to its own country) and are not confined to those listed as UK priorities (Wales, Scotland and NI have added extra habitats and species to their devolved listings).

page 624 - paragraph 4 should be amended as *Zostera* beds do not grow in saltmarshes.

Appendix 4 Other Potentially Relevant Initiatives

4.3 National Initiatives

The Interim Marine Aggregates Dredging Policy should be referred to in this section. This is an important policy document which makes recommendations about areas that may be suitable and should be taken into account by any assessment of constraints upon windfarm licensing.

The Welsh Coastal Tourism Strategy should also be referred to, as should the existence of 'Regulation 33 advice' and management plans prepared for European Marine Sites as a requirement of the Conservation (Natural Habitats, &c) Regulations 1994.



Cyngor Cefn Gwlad Cymru Countryside Council for Wales

4.4 Other Renewable Energy Initiatives

It would have been helpful to have an 'implications' column in these tables for the previous tables in respect of International and EU Strategies, etc. The potential for consequent and in-combination effects arising from a Severn Barrage (or any other tidal structures) may be considerable.

4.5 Recent Key Acts and Bills

This section should also include reference to Natural Environment & Rural Communities Act 2006.

Appendix 5 Regulatory Controls

Sub-sections relating to habitats and species protection should also include reference to consenting and assenting mechanisms that apply to works affecting SSSI's under the Wildlife & Countryside Act 1981 as amended.



Gofalu am natur Cymru - ar y tir ac yn y môr • Caring for our natural heritage - on land and in the sea

Prif Swyddfa/Headquarters

MAES-Y-FFYNNON, PENRHOSGARNEDD, BANGOR LL57 2DW FFÔN/TEL: 01248 385500 FFACS/FAX: 01248 355782

<http://www.ccw.gov.uk>

From: Derek Limbert
Sent: 10 March 2009 11:34
To: sea.2009@berr.gsi.gov.uk
Subject: Strategic Environmental Assessment-Offshore Energy

Dear Sir,

I list below a number of comments on your recently published SEA with respect to Offshore Energy. I am restricting my comments to the Offshore Wind aspects and whilst appreciating that this is an Environmental Assessment my comments are largely directed at the practical and Engineering aspects of the contents.

The fact that this assessment has been carried out at all means that there is an intent to proceed with some or all of the proposed developments at some time in the future and my observations are primarily concerned with the execution of any proposed developments. The fact that they may have been given a more or less clean bill of health from an environmental point of view does not mean that they are, as indicated in the report feasible or economically viable. Equally the Assessment does not consider in any detail the land based activities relating to Offshore Wind or the short life span of Wind turbines and the overall logistical requirement for their dismantling and disposal after only 20 years life.

These comments are not in any order of importance or any other criterion, but are observations that I hope will be of value to BERR and DECC in considering the proposed vast investment in Offshore Wind and ensuring that this expenditure is not otiose.

- There is an indication that 25GW of Offshore wind produced electricity will be required by 2020 in order to meet the Government's intent of producing 30% of our electricity from 'renewables' by 2020. Bearing in mind that there are no other proven ways than wind, albeit uncontrollable unpredictable intermittent and expensive, this is inadequate. At 30% efficiency 25GW will produce only 7.5GW continuous equivalent. Current average production of electricity in the Country Including Scotland and Northern Ireland is around 42GW, 30 % of which is 12.6GW, it is not clear therefore where the bulk of the other 5GW continuous production will come from. It would appear therefore that the 25GW figure may be too small.
- The graphs on Page 89 Fig 5.11 seems to suggest a programme for the construction of the 25GW of wind turbines. This appears to show a rate of about 600 no 5MW turbines per year, i.e. 3000MW per year. Bearing in mind that The London Array at 1000MW is currently planned to take 4 years to construct, this will mean that by 2013 or so 12 such projects would be underway simultaneously in order to meet this target!
- The question of decommissioning does not appear to have been addressed in any meaningful way. The offshore wind turbines are likely to have a life of around 25 years. This means that the dismantling of the first machines will probably be taking place at the same time as new machines are being installed. This is likely to be the

case as it would appear impossible to install the proposed number of turbines in the next ten years.

- Carbon Capture and Storage (CCS):- CCS does not appear to have been considered in this report. There appears to be growing enthusiasm for this technology, if it can be demonstrated to work and be financially viable. A demonstrator plant is planned to be in operation by 2014 which will produce of the order of 2 million tonnes of CO₂ per annum or around 5000 tonnes per day. I understand that 'storing' this in or under the North Sea is being contemplated. Should CCS prove viable and the North Sea a suitable repository geologically, as much as 250,000 tonnes per day may need to be dealt with from 2020 onwards. This quantity is of the same order of magnitude as the amount of gas extracted on the average throughout the life of North Sea gas extraction. It would appear that the question of CCS is worthy of greater environmental investigation, if it is to be stored, for ever, under the North Sea than the question of wind turbines.

Derek Limbert C Eng FICE

The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

By email only
sea.2009@berr.gsi.gov.uk

22th April 2009

Offshore Energy SEA Consultation

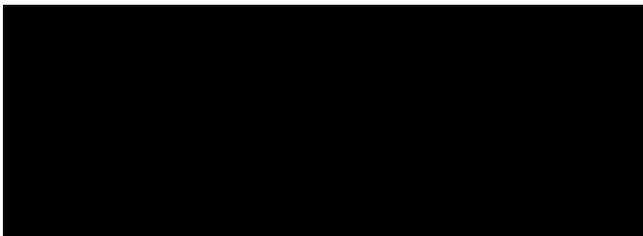
DONG Energy is grateful for the opportunity to comment on the Offshore Energy SEA Environmental Report. This response is made solely in respect to offshore renewable installations.

DONG Energy was founded in 2006 as the result of a merger of six Danish energy companies – DONG, Elsam, ENERGI E2, Nesa, Copenhagen Energy's power activities and Frederiksberg Forsyning. DONG Energy is a major European energy company with extensive interests across the energy supply chain. 15% of the company's electrical output is from renewable sources, predominately wind power. DONG Energy has been a pioneer in the establishment and operation off offshore wind farms and today the company is a world leader in offshore wind energy.

In the United Kingdom, DONG Energy is a 50% shareholder in the Barrow Offshore Wind Farm and a 100% shareholder in the Burbo Banks Wind Farm (both now in commercial operation DONG Energy is currently constructing the Gunfleet Sands I+II projects and furthermore holds sole or shared interests in six other UK offshore wind farms in varying stages of development -, London Array, Scarweather Sands, Walney, West of Duddon Sands, Westermost Rough and Wigtown Bay.

Specific comments to the recommendations in the SEA environmental report are attached as an annex to this letter.

Yours sincerely



Gert Hemmingsen
Director
DONG Wind (UK) Ltd
Tel +45 4480 6504
gerhe@dongenergy.dk

DONG Wind (UK) Ltd
33 Grosvenor Place
Belgravia, London
SW1X 7HY
UK

Tel.: +44 (0) 207 811 5200
Fax: +44 (0) 207 811 5298

Web: www.dongenergy.co.uk

Company Registration No:
04984787

We have not produced a comment for every recommendation in the SEA environmental report. The comments below correspond to the specific recommendations preceding them:

1. In areas with high renewable energy generation potential DECC should ensure decisions on renewable energy leasing and licensing for oil & gas (including natural gas storage) are coordinated to minimise potential sterilisation of areas for other industries. This recommendation extends to maintaining options for potential future geological storage of captured carbon dioxide.

1. DONG energy agrees that there is a need for coordinated licensing between renewable energy, oil & gas and potential CO₂ storage sites. How this will be achieved is critical; wherever possible co-existence of the industries should be promoted, but DECC should investigate how this could take place. E.g. horizontal drilling, subsea completion etc.
2. DECC should keep in mind the extra restrictions facing offshore wind developers, including spatial restrictions such as the boundaries of the round three zones, and constraints to development within zones, such as depth and international shipping lanes. As these constraints will reduce the area available for development within the round three zones, further spatial restrictions from future developments, e.g. new oil & gas infrastructure need to be avoided in order for the UK Government's 2020 targets to be realised. Where there is a potential conflict between offshore wind and oil & gas efforts should be made to site new oil & gas infrastructure in areas that are already spatially constrained to wind development.

2. The draft plan/programme for an additional 25GW of offshore wind farm (OWF) generation capacity will require wind farm development on a massive scale. In advance of a formal marine spatial planning system being in place for the UK, the leasing and consenting of OWFs must ensure the minimisation of disruption, economic loss and safety risks to other users of the sea and the UK as a whole. In particular, there should be a presumption against OWF developments which:

- a. impinge on major commercial navigation routes, significantly increase collision risk or cause appreciably longer transit times*
- b. occupy recognised important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede previous activities)*
- c. interfere with civilian aviation including radar systems*
- d. could potentially jeopardise national security for example through interference with radar systems or significant reductions in training areas*
- e. result in significant detriment to tourism, recreation and quality of life*

1. This statement should not be used to prevent development in areas that may have an impact on the listed issues, as responsible developers we would expect any of these issues to be investigated during the Environmental Impact Assessment process and development to occur only where a developer has shown that significant impact will not occur or appropriate mitigation measures can be put in to place. This statement could be used as an excuse for other stakeholders to erect barriers to development and not engage with developers, DECC needs to ensure that developers are still able to investigate all opportunities to prove that any impact will not be significant.

2. Additionally DECC should clarify whether it considers the areas presented in the SEA GIS exercise as potential hard constraints are now considered off limits to wind development or whether there is scope for interpretation (e.g. using improved data etc). Currently the definition of some of the points a-e lacks clarity, there should also be some clarification of terms such as 'important fishing grounds' and 'major commercial navigation routes' and whether these are now fixed or if there is scope for determining these definitions or scope for determining whether they apply in specific cases, within the EIA process.
3. With regard to the navigation data used for mapping shipping density in the SEA report, we are concerned that unpublished data (MCA OREI 1 report) was used; we would therefore not expect that the areas excluded from zones using this data are considered no go areas for wind development by the government response to the SEA. Further research and analysis of data, including analysis of the type of shipping, needs to be undertaken.

4. Reflecting the relative sensitivity of multiple receptors in coastal waters, this report recommends that the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km). The proposed coastal buffer zone is not intended as an exclusion zone, since there may be scope for further offshore wind development within this area, but as mitigation for the potential environmental effects of development which may result from this draft plan/programme. The environmental sensitivity of coastal areas is not uniform, and in certain cases new offshore wind farm projects may be acceptable closer to the coast. Conversely, a coastal buffer in excess of 12nm may be justified for some areas/developments. Detailed site-specific information gathering and stakeholder consultation is required before the acceptability of specific major Round 3 or subsequent wind farm projects close to the coast can be assessed. Marine spatial planning proposals are under consideration in Parliament, which would give coastal regulators and communities further opportunities to have a say in the way the marine environment is managed, in addition to the existing routes for consultation as part of the development consent process.

1. We do not agree with setting what seems to be an arbitrary figure and attaching it to a proposed coastal buffer zone. Although we welcome the fact that it is recognised that the buffer zone should not be considered an exclusion zone, in practise many stakeholders could come to recognise it as one, especially with a specific distance attached to it. In practice a nominal buffer zone of 12nm that may not be required in some instances or may be required to be larger in others instances is a confusing concept. As responsible developers we would consider and investigate all of the issues raised in the SEA that contributed to the proposal for a buffer zone within the EIA required for development consent. It would be better for the SEA to suggest that certain, specified issues become more prevalent the closer to shore development occurs (e.g. coastal birds) and should therefore expect to receive detailed examination in any development's EIA.

7. The effects of noise on marine mammals particularly from piling and seismic survey remain an issue of debate. A range of mitigation measures are available and their adoption is normally required through consenting. However, there is a need for cross-industry coordination of what noisy activities are planned, where and when, to facilitate the assessment of cumulative effects and implementation of temporal/spatial mitigation actions. The approach would require a mechanism to facilitate the exchange of information, for example through a web-based forum hosted by DECC, JNCC or the future MMO.

1. Any system developed in this regard must be fair and equitable to all developers and should aim to coordinate activity to prevent delays. The specific needs of different industries must be considered within this coordination. E.g. considering the potential restrictions on piling the construction of an offshore wind farm should not be then delayed because there have been too many seismic surveys undertaken by another industry. We would recommend that clear guidance and direction is forthcoming from the departments and bodies involved in this coordination and on the definition of what will be considered harmful doses of noise.

9. There remain a number of subject areas for which the information base is limited and will need to be enhanced to support future marine spatial planning as well as project specific consenting. These information gaps include aspects of the natural world and human uses, with regional context and long-term trend data notably lacking. These gaps include:

- *Seabed topography and texture. For some areas there is excellent data for example from multibeam mapping undertaken variously including by the MCA, BGS and the SEA programme, but the UK lacks a coordinated programme to marshal such data, to identify priority gaps and to find ways to fill them*

- *Recent information on the distribution of fish eggs and larvae, and variability in space and time*

1. This should be a priority area for research and funding effort by the SEA process, DECC and Defra etc. More certainty in this area would help reduce unnecessary construction delays, aid conservation of stocks and reduce developer risks.

- *Detail of bird migration patterns, and variability in space and time including flight heights in different weather conditions*

- *An understanding of the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs*

- *Ecology of most marine mammal species and in particular important areas for breeding, foraging and resting*

2. These three points are all areas that should also be priorities for government research funding

- *Finer scale distribution of fishing effort, gears and catches for smaller vessels (<15m)*

3. DECC should discuss with the MFA the possibility of introducing a VMS system for the smaller fishing vessels as this will improve certainty for the MMO's marine planning system and help developers and fishermen alike by allowing developers to incorporate the important fishing grounds in to their planning with increased certainty.

14. Efforts are (or will be) underway to identify offshore Marine Conservation Zones/Marine Protected Areas e.g. under the Marine Strategy Framework Directive, OSPAR and the Marine and Coastal Access Bill. Where the objectives of the conservation sites and renewable energy development are coincident, preference should be given to locating wind farms in such areas to reduce the potential spatial conflict with other users.

1. Whilst DONG recognises the potential for this type of cooperation between offshore wind farms and conservation zones and welcomes a recognition that this is a possibility it should be noted that more research on the subject is needed, without it developers will face greater risks and longer development timescales than for developments outside of such areas. Whilst we recognise the potential for wind farms to work alongside and promote the objectives of a conservation zone the conservation bodies and other stakeholders will need to be comfortable with this idea and this means more evidence is required. Whilst additional evidence and time is rightly required of developers choosing to try to develop inside a conservation zone this would be an unfair burden if the choice was made for them due to a spatial conflict.
2. We would be concerned that in instances of spatial conflict wind developers are pushed in to areas that require longer to develop (e.g. appropriate assessments), and carry a greater risk of failing to be granted consent. This point underlines a theme within the SEA that wherever potential spatial conflict occurs there seems to be a presumption against offshore wind development. This point needs to be addressed at some level, in some instances during consenting for round three decisions will have to be made between stakeholders, if in all instances of spatial conflict the presumption is against offshore wind then the chances of hitting the UK Government's 2020 targets be severely diminished.

17. The Offshore Vulnerability Index (OVI) to surface pollutants developed by the JNCC should be reviewed in the light of results from recent aerial and boat based bird survey data, and updated if necessary. Consideration should also be given to whether the development of UK-specific individual waterbird species sensitivity indices and mapping of a Wind Farm Sensitivity Index (WSI) in UK waters would be useful in support of site selection and consenting.

18. The existing initiatives to develop waterbird Population Viability Analysis for sensitive species should be progressed, including, if necessary, research to improve the accuracy of inputs to the models.

1. DONG agree that points 17 and 18 are useful areas to be researched further.

22. It is recommended that in certain key areas of marine mammal sensitivity, operational criteria are established to limit the cumulative pulse noise "dose" (resulting from seismic survey and offshore pile-driving) to which these areas are subjected. This could be implemented within the existing regulatory framework for activity consenting, but will require a mechanism to facilitate the exchange of information, for example through a web-based forum hosted by DECC, JNCC or the MMO when established, with suitable links to all parts of the UK.

1. Please see our answer to recommendation 7.

DORSET COUNTY COUNCIL OFFICER COMMENTS ON OFFSHORE ENERGY SEA ENVIRONMENTAL REPORT

1. INTRODUCTION

- 1.1 These comments are made on behalf of officers of Dorset County Council. We welcome the opportunity to comment on the Environmental Report arising from the Offshore Energy SEA process. Our comments relate largely to our interest in potential development in SEA areas 3 and 4 which cover the Dorset coast, and in the West Wight area identified for potential offshore wind farm development, though some have wider application and relevance.

2. OVERALL COMMENTS

- 2.1 We support the aims of the plan/programme as set out in the Energy White Paper 2007, namely to **tackle climate change** by reducing carbon dioxide emissions and ensuring **secure, clean and affordable energy supply**. While there are legitimate concerns about the impacts of offshore development on coastal landscapes, biodiversity and other issues, we believe that these are not inherently in conflict with our objective of protecting and enhancing our unique coastal and marine environment. Individual schemes will clearly need to be judged on their merits, and we are keen to ensure that all schemes are subject to robust environmental tests regardless of the form of energy they are seeking to promote. We set out below some of the policy tests on which the County Council's view will be based, and hope that the SEA process can take these into account as it progresses.
- 2.2 We support the conclusion of the Environmental Report that of the **alternatives** outlined (1. Do not offer any areas for leasing/licensing 2. Proceed with a leasing and licensing programme 3. Restrict the areas offered for leasing and licensing temporally or spatially) that alternative 3 should be the preferred option. We also broadly support the conclusion that 'there are no overriding environmental considerations to prevent the achievement of the offshore oil and gas, gas storage and wind elements of the plan/programme, albeit with a number of mitigation measures to prevent, reduce and offset, significant adverse impacts on the environment and other users of the sea', subject to individual schemes complying with the policies and passing the tests referred to below.
- 2.3 We also support the conclusion of the Environmental Report on **buffer zones** that the bulk of offshore wind generation capacity 'should be sited well away from the coast, generally outside 12 nautical miles (some 22km)'. While we accept that the environmental sensitivity of coastal areas is not uniform, and that this buffer could be closer or further offshore depending on local sensitivity, we would emphasise that we see the Dorset coast as particularly sensitive, this being reflected by the international and national designations which cover it, particularly the Dorset and East Devon Coast World Heritage Site and the Dorset AONB, plus the Heritage Coast, Natura 2000, SPA and SAC designations. This said, consideration of sensitivity should clearly apply to all forms of offshore development and activity and we would not wish to single out offshore wind farms which offer many positive benefits compared to non-renewable forms of energy, some of which pose greater threats to the integrity

of the coastal environment – for example, the potential impact of oil spills on both the geology and the visitor economy of the World Heritage Site.

- 2.4 While we also accept that **wave and tidal energy** do not form part of the plan or programme considered by the SEA, we would like to take this opportunity to urge DECC to support these technologies more fully with a view to improving their commercial viability, and reflecting the fact that their viability will change as fossil fuels become more scarce.
- 2.5 We note that one of the stated aims of the SEA process is to ‘provide routes for **public and stakeholder participation** in the process’. While DCC has not joined other local authorities in the public criticisms of DECC and the Crown Estate which have been levelled about the process to date, we do believe that some opportunities to engage local authorities and the wider public may have been missed and are concerned that the process in future should address this, and could be more effectively promoted to improve engagement and understanding.
- 2.6 The SEA process inevitably concentrates on offshore impacts, though clearly associated onshore development will also be of concern to coastal communities and local authorities. We would welcome clarification as the process develops of how the **onshore implications of offshore development** will be dealt with through the planning system.

3. KEY ENVIRONMENTAL CONSIDERATIONS SPECIFIC TO DORSET

- 3.1 Safeguarding Dorset’s unique environment is one of DCC’s primary corporate aims, and a headline objective in Dorset’s Community Strategy, *Shaping our Future*. We are therefore particularly keen to ensure that the nature and significance of onshore areas designated for their environmental quality is understood and reflected in the SEA process and specific project proposals which may come forward. While individual schemes must be judged on their merits as they come forward, we hope that the following will be taken fully into account:

- *The Dorset and East Devon Coast World Heritage Site*: the ‘Jurassic Coast’ was inscribed by UNESCO as a World Heritage Site in 2001. The Site was granted World Heritage status under UNESCO’s criteria viii – ‘Earth’s history and geological features’ - which indicated that its geology and geomorphology were of Outstanding Universal Value. The implications of being on the World Heritage List are that properties have Outstanding Universal Value. UNESCO define this as ‘cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole’.

Those responsible for managing World Heritage properties (i.e. the UK Government as ‘state party’ to the World Heritage Convention, and the WHS Steering Group constituted locally to oversee development and implementation of the site’s Management Plan) therefore have a ‘common obligation’ to ensure that they are protected for present and future generations, not just through legal means, but through responsible, inclusive, sustainable management practices. This is the primary reason

why a World Heritage Site must have an agreed management plan in place, and this expectation has been reinforced in the Governments Draft Circular on Protection of World Heritage Sites and accompanying guidance from English Heritage. These make clear that Management Plans should also address issues of the setting of the World Heritage Site, and views to and from the site, as well as the site itself.

The Management Plan for the Dorset and East Devon WHS is currently being reviewed and a Consultation Draft Management Plan for the period 2009-14 was published in March 2009. The Draft Circular on Protection of WHSs states that relevant policies in Management Plans should be treated as material considerations in making plans and planning decisions. Relevant policies from the Consultation Draft Management Plan which we believe should be applied to the offshore energy programme are therefore highlighted below.

- *The Dorset AONB*: the Dorset AONB was designated in 1959 and is the fifth largest AONB in the country. It covers approximately 42% of the County and stretches from Lyme Regis in the west and along the coast of Poole Harbour in the east. As a coastal protected landscape, management of the Dorset AONB must take into account its links to the marine environment. Activities at sea can have significant implications for the character and qualities of the AONB. Production of a Management Plan for the AONB is a statutory requirement, and the Management Plan has been recently revised to cover the period 2009-14. As such it provides an up to date policy framework against which proposals for offshore development should be tested. Relevant policies which we believes should be applied to the offshore energy programme are therefore highlighted below.
- *Durlston National Nature Reserve, Castle and Country Park*: photo-montages shared with us in pre-application discussions with potential developers show the visual impact of offshore wind farm development from Swanage Pier. While a valid viewpoint, we believe that viewpoints with higher elevations along the Dorset coast should also be an essential part of the assessment of the programme in general and of individual schemes. Schemes viewed from elevated locations will clearly have a very different visual impact from schemes viewed at sea level, which may in turn lead to different perspectives on siting and mitigation.

One of the key viewpoints in respect of the West Wight area is that from Durlston National Nature Reserve near Swanage. Durlston Castle is currently undergoing a multi-million pound refurbishment which will increase its position as a major visitor attraction, and provide an important gateway to the World Heritage Site. The National Nature Reserve at Durlston is also England's newest and Natural England's first NNR. We would urge that the significance of the site be recognised in it being used as a key viewpoint for the purposes of Environmental Assessment. Again, we do not suggest that the importance of Durlston should necessarily prevent offshore development viewable from the site, but its importance should be reflected in the assessment process. The need and potential for interpreting offshore development at coastal visitor centres like Durlston, explaining to the visiting public why it might be considered necessary, what the costs and benefits might be etc - should also be borne in mind as part of the process of building public understanding about schemes which are deemed necessary.

4. POTENTIAL AREAS OF IMPACT

Using the headings identified in the Environmental Report as potentially affected receptors, we would make the following comments:

4.1 Biodiversity, habitats, flora and fauna

4.1.1 We support the conclusion that research results be monitored to inform site specific considerations. Indeed, the programme of research which will be necessary to robustly assess potential schemes could be a major opportunity to fill in the many gaps in our knowledge about the marine environment, and in this context we would hope that research is promoted actively and not just monitored passively.

4.2 Geology and sediments

4.2.1 As set out above, the basis of the World Heritage Site inscription is the earth sciences and geological interest represented by the Site. We would therefore encourage the SEA process, and individual scheme assessment, to take full account of this. Relevant policies from the draft WHS Management Plan include:

- 'Policy 1.2 Protect the Outstanding Universal value of the site through prevention of developments that might impede the natural processes of erosion, or obscure the exposed geology, as set out in the GC/SSSI details, now and in future'.
- 'Policy 1.3 Mitigate negative impact on the natural processes of erosion and exposed geology where developments in the Site or setting do take place'.

4.2.2 We do not regard either of these policies as necessarily being in conflict with offshore energy development, though there is of course the potential for conflict based on proximity of individual schemes to the coast and onshore infrastructure associated with offshore development.

4.3 Landscape/seascape

4.3.1 Relevant policies from the AONB Management Plan include:

- 'PD1i: Support renewable energy production where compatible with the objectives of AONB designation, taking into account the relative sensitivity of the landscape'.
- 'PD3b: Protect the quality of uninterrupted panoramic views into, within and out of the AONB'.
- 'CS3b Conserve tranquil areas along the coast'.
- 'CS3c Conserve the undeveloped nature of the coast'.
- 'CS3d Promote and support the removal of intrusive and urbanising features from the coast'.
- 'CS3f Promote understanding of underwater landscapes'.

4.3.2 While these policies are not necessarily in conflict with offshore energy development, subject to its precise location and scale, to ensure a robust assessment of the offshore licensing programme, however, we would encourage the proposals to be tested against these policies.

4.3.3 The 'setting' of the World Heritage Site is also an important landscape/ seascape consideration, and while the setting of the WHS relies largely on AONB designations for its statutory protection, there are parts of the Site and its setting which are not covered by AONB designation (e.g. Portland) and these could be affected by development in the West Wight zone. Relevant policies from the draft WHS Management Plan include:

- 'Policy 1.5 Protect the landscape and natural beauty of the Site and setting of the World Heritage Site from inappropriate development.'
- 'Policy 1.9 Any offshore oil exploitation and exploitation, should it be considered, must take full account of the seascape and natural beauty of the World Heritage Site.'
- 'Policy 1.14 Encourage offshore energy developments to take full account of the Site and seaward setting, particularly regarding the infrastructure needed to bring power ashore.'

4.4 Climatic factors

4.4.1 We question the statement in the non-technical summary of the Environmental Report that 'domestic hydrocarbon production would be neutral in the attainment of UK climate change response policy objectives, and potentially positive in respect of oil, since associated gas is put to beneficial use rather than mostly flared as in some other sources of potential supply'. While the relative benefit of domestic hydrocarbon production is not disputed, given the link between the burning of fossil fuels and climate change, and the importance of a robust SEA process, the suggestion that hydrocarbon production could in any way be 'neutral' or 'positive' (as opposed to 'less negative') in terms of meeting climate change objectives and the UK's legally binding carbon emission reduction targets risks undermines the credibility of the SEA process.

4.5 Other users, material assets (infrastructure, other natural resources)

4.5.1 We recognise that offshore wind farm development could have both positive and negative impacts on the tourism sector and would welcome further research to quantify the costs and benefits in this and other areas of economic activity, particularly commercial and recreational fishing, ports and shipping.

4.6 Cultural Heritage

4.6.1 The major designations seem to have been considered properly. In due course, more detailed archaeological consideration will be required before any sort of detailed planning decision on a particular site can be made. The general approach is as follows. The impacts on sea-floor archaeology from construction of turbines and associated works will have to be considered. That archaeology includes not only the more obvious wrecks but also buried landscapes, etc. There is a need for assessment using sources such as local Historic Environment Records as well as the more national ones, then probably an evaluation by sonar and diver surveys, etc. Less obviously, but also of importance, there is a need to consider the potential impact of any associated works on land (support infrastructure, any new power lines, etc.) on archaeological remains, historic buildings and of elements of the historic landscape. These would have to be assessed and evaluated using the appropriate methods. It is also important to say that these exercises should be

used to inform decisions about locations of wind-farms, etc, rather than simply carrying them out once sites have been chosen.

5. CONCLUSION

- 5.1 Recent press coverage has highlighted the potentially controversial nature of offshore development on the Dorset coast. We believe that if public understanding of the need for offshore development is to be developed, it is vital that the process of bringing schemes forward involves the communities affected and their elected representatives in local government. As detailed proposals come forward we are therefore keen to work with DECC, the Crown Estate, developers and other interested parties to ensure a robust assessment of the potential impacts, both positive and negative, and to apply the tests highlighted above as part of an ongoing SEA process and the assessment of individual schemes.

- 5.2 Dorset County Council and its partners in the Dorset Coast Forum recently submitted a successful Interreg bid for a project to develop a pilot marine spatial plan for an area of the Dorset coast around Weymouth Bay, part of which overlaps with the West Wight area identified for potential wind farm development. The bid will also enable the development of innovative GIS-based planning tools to facilitate the marine spatial planning process. DEFRA are supporting this work which we hope will provide useful lessons to shape the development of the detailed marine spatial plans promised by the Marine Bill. The project, Combining Sea and Coastal Planning in Europe (C-SCOPE) involves substantial research into seabed mapping, seascape assessment and other areas pertinent to the offshore licensing regime, and we would therefore be keen to work with DECC and other interested parties to discuss the development of, and share the conclusions from, this research as we believe it could usefully inform the offshore licensing process. If you would like further information on the project, please contact the project manager, Ken Buchan, Coastal Policy Manager at Dorset County Council on 01305 225132.

From: Cora Seip - Markensteijn
Sent: 23 April 2009 19:09
To: sea.2009@berr.gsi.gov.uk
Cc: Epost
Subject: Offshore Energy SEA Consultation

Dear Sir, Madam,

On behalf of the Dutch Fisheries Organisation, I would like to react on the SEA of a draft plan/programme to enable further rounds of offshore wind leasing and offshore oil and gas licensing in UK waters.

The Dutch Fisheries Organisation is an umbrella organisation for the Dutch catching sector, including the representative organisations for the demersal and pelagic fleets.

First, we would like to comment on the site selection:

The North Norfolk Sandbanks are an important fishing ground for the Dutch fishing fleet. The area is especially important for the beam trawl fleet of Texel, Den Helder, Urk and Katwijk (approximately 16 vessels). The same goes for the Dogger bank, which is an even more important area for the Dutch fishing fleet. The area is important for almost the whole of the Dutch beam trawl fleet, and flag vessels (about 40-50 vessels). The importance of these areas for these vessels varies between 90% and 40% of their total income. The areas have been key fishing grounds for over 40 years. Furthermore, they are 'clean' areas to fish, meaning that the beam trawl fisheries in these areas have very little discards. As you may know, the reduction of discards is a high priority of the European Commission and our fishing fleet.

The area Hornsea is an important fishing ground for both flatfish fisheries and nephrops fisheries. The area is important for approximately 35 vessels from the northern ports (Texel, Den Oever, and Den Helder)

The fact that these areas are of importance to the Dutch (and Danish) fleet is not recognized in the Offshore Energy SEA Environmental Report.

We ask you to consider the Dutch fishing activities as activities of significant importance, and involve us in the further process.

The building of wind parks on the Norfolk Sandbanks, Dogger Bank, and the Hornsea area, and the subsequent exclusion of fisheries in these areas, will have a large economic impact on the Dutch fishing industry. This will not only affect the fishermen but also the trade.

Most likely, displacement of the fishing effort will take place, with increased fuel and labour costs, and a more uncertain income as a result.

We trust to be closely involved with the evolution of the management of the offshore wind leasing and offshore oil and gas licensing in UK waters that potentially affect the Dutch fishing industry. In the following stages, we want to be consulted, and are more than willing to provide you with additional information on the Dutch fishing industry.

With kind regards,
Dutch Fisheries Organisation

Cora Seip

Dutch Fish Product Board/Dutch Fisheries Organisation
Cora Seip – Markensteijn, MSc
Policy Officer Nature and Spatial Planning
Postbus 72
2280 AB RIJSWIJK

website: www.pvis.nl



> Return address P.O. Box 5807 2280 HV Rijswijk (ZH) The Netherlands

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR
United Kingdom

RWS Noordzee

Lange Kleiweg 34
Rijswijk (ZH)
P.O. Box 5807
2280 HV Rijswijk (ZH)
The Netherlands
T +31 70 336 66 00
www.rijkswaterstaat.nl

Contact

-Joris Geurts van Kessel

T +316 - 53 23 69 40-

Date 14 April 2009
Subject Comments on Offshore Energy SEA Consultation

Our reference

- 0693

Your reference

-

Enclosure(s)

-

Dear Sirs,

With pleasure we have reviewed the strategic environmental assessment (SEA) on offshore energy. I would like to compliment you with the extensive documented report. In general, we can agree on the findings in the report. However, there are a number of remarks I would like to make with regard to this SEA.

Ecology

1. We agree that two major issues are underwater noise and barrier effects.
2. In the assessment, the effect of underwater noise on fish larvae is only addressed in the context of seismic research. However, from the appropriate assessments which were made for 17 initiatives for wind farms in the Dutch part of the North Sea, and the report "the Development of a framework for Appropriate Assessments of Dutch offshore wind farms, (Prins *et al* 2008), it was concluded that a building method for the foundation of wind farms which uses pile driving could have a serious effect on fish larvae. This effect could result in a reduction of 3 – 9 % in the transport of fish larvae towards the Natura2000 coastal zones. This effect could add up with bird mortality due to collision on wind farms and become, accumulated, significant. This forces us to take drastic measures such as prohibiting pile driving in the season January – June. We would like to know if you have considered such potential effects as well in the UK.
3. I agree with your conclusion that local effects on bottle nose dolphins would need a project-specific assessment including recommendation concerning mitigating measures. Unfortunately, examples of effective mitigation measures are currently lacking as far as we know. We would like to learn more about these mitigation measures.
4. The assessment that overall the barrier effects and collisions are unlikely to have a significant effect on bird populations on a strategic level may not be true for the accumulated effect of multiple wind farms on a special protected area such as a Natura2000 area. Especially, effects of wind farms on the lesser black-backed gull in the Netherlands could accumulate to significant levels for certain colonies of this bird at the Dutch coast.

5. The conclusion that "the scale and consequences of environmental effects in adjacent territories due to activities resulting from will be less than those in the UK waters are considered unlikely to be significant" might be premature. At the least, coordination in building period might need to be arranged between neighbouring countries – if pile driving is issued, in order to reduce the combined effect of the development zone R3, the planned Belgian wind farms on the border with the Dutch EEZ and the Dutch ("Borsele") wind farms at the Dutch side of this border. Also the accumulated effects of the bird collisions due to the English, Belgian en Dutch windfarms may have environmental effects.
6. We have notified Brussels that the sea areas Doggersbank and Klaverbank fulfil the requirements of the Habitat directive. We expect these areas to be assigned as Natura2000 site and protected by management from 2013 onwards. This might have an effect on the assessment of off shore activities on the North sea which is not incorporated yet is this SEA.

RWS Noordzee

Date
6 April 2009

Our reference
-

Shipping

7. We appreciate that a risk approach is used which is based on 'As Low as reasonable? practice' (ALARP).
8. We would like to share views on the use of wind farms by vessels under certain conditions. Until now, shipping of any kind (except maintenance) is not allowed.
9. We also would like to share views and seek cooperation on the research on radar and radio interference.

Flight safety

10. We note the remark that the required free air space for helicopters flying on instruments may restrict the location of offshore wind farms developments, although in our opinion variations to the 6 nm zone can be agreed upon by applying adequate risk assessment and consultation with the field operator. In the Dutch case we assess the consequences of the limitation in accessibility of the platform, maintaining a requirement of 5 nm in the direction of the approach during instrument flight.

International cooperation

11. Considering the location of probable future windfarm area in the Netherlands called "IJmuiden", which is adjacent to the UK seas and foreseen English windmill areas, we suggest to investigate the possibilities for further cooperation when it comes to detailed planning.

Looking forward to your response.

Yours faithfully,

Joris Geurts van Keulen
Head of Department of Regulation & Licencing for Water and Shipping Affairs
Rijkswaterstaat
Ministry of Transport, Public Works and Water Management

E.ON UK Response to the UK Offshore Energy Strategic Environmental Assessment

1. E.ON UK is one of the UK's largest retailers of electricity and gas. We are also one of the UK's largest electricity generators by output and operate Central Networks, the distribution business covering the East and West Midlands. In addition, our E.ON Climate and Renewables business is a leading developer of renewable plant in the UK. Whilst the majority of our comments to this document are from the perspective of an offshore wind developer, E.ON UK also has a team dedicated to the development of gas storage opportunities (E.ON Gas Storage). In addition we are currently part of the UK government's competition to bring forward a carbon capture and storage demonstration project at our Kingsnorth plant in Kent.
2. Tackling the three energy challenges facing the UK, namely the requirement for secure, clean and affordable energy supplies, will necessitate the considered development of the UK's offshore resources. Indeed, meeting the UK and international targets for greenhouse gas mitigation and renewable energy utilisation, will realistically require an altered offshore landscape, whether for the storage of essential gas supplies, the long term storage of carbon dioxide or the deployment of offshore renewable energy technologies.
3. As a principle we support the use of appropriate mitigation measures that will enable sustainable development to co-exist with the environment and other interests. Whilst this is reflected in some of the conclusions, this is not reflected on a consistent basis and is primarily what is at the heart of our concerns.
4. The response to the main areas discussed in the Environmental Report is set out below.

Biodiversity, habitats, flora and fauna

5. The analysis undertaken has indicated that single seismic or pile-driving sources are unlikely to have a significant disturbance effect on marine mammals. We therefore welcome the conclusion that there is no justification to place a prohibition on such activities and we agree that where there are potential impacts, these can be mitigated through an Environmental Impact Assessment. E.ON also agrees with the view that physical disturbance associated with activities resulting from proposed oil and gas licensing and wind farm leasing will be negligible in scale relative to natural disturbance and the effects of demersal fishing.
6. We note with concern however the position taken regarding the physical presence of offshore infrastructure and support activities and how they may potentially cause behavioural responses in fish, birds and marine mammals.

7. In particular, we take issue with the current assessment of the effects on inshore birds, which concludes that "based on available evidence, displacement, barrier effects and collisions are all unlikely to be significant to bird populations at a strategic level". We believe that the approach recommended in the report of incorporating a coastal buffer zone of 12 nautical miles (some 22km) is unwarranted, and propose that a reasonable approach to address this issue is to assess projects on a case by case basis. We recognise that some areas may not be appropriate for development but this should not result in a blanket ban. We therefore urge a reconsideration of this approach and instead suggest a soft constraint which can be managed through a formal Environmental Impact Assessment

Geology and sediments

8. We agree with the view that sediment contamination is not a significant issue in wind farms or recent hydrocarbon developments. Indeed as noted in the report, the composition of planned discharges from wind farm and oil industry operations is regulated, with increasingly stringent controls applied in recent years.

Landscape/seascape

9. As a responsible developer, we work very closely with stakeholders to ensure that any visual impact of our wind farm and other energy developments are mitigated through careful design and consultation. We are sympathetic to people's concerns and through careful design believe that this is not a major issue. Therefore identifying solutions is a more appropriate way to address any concerns, rather than introducing a generic guideline of a 12 nautical mile buffer zone for large (>100MW) wind farm developments.

Water Environment

10. We agree with the assessment that significant contamination or ecological effects of drilling discharges are not expected from offshore wind farm developments.

Air quality

11. From our experience of constructing and operating offshore wind farms in the UK, we do not believe that there are significant effects on local and regional air quality. We accept that where this may be a risk, appropriate mitigation measures should be considered via the normal Environmental Impact Assessment process.

Navigation

12. We have significant concerns with one of the key conclusions of the report. E.ON does not accept that there is a blanket requirement for a prohibition on turbine location within a 1nm buffer of a primary navigation route. Part of our concern relates to the decision being based on unpublished MCA "OREI 1" primary navigation routes. More fundamentally however, any development as a principle should be

assessed on a case by case basis. We believe that with appropriate mitigation measures, sustainable development from the offshore wind industry can co-exist with the shipping industry, and that these industries should be treated equally in terms of their importance.

Conclusion

13. We believe that there is a fundamental flaw in the analysis shown in table 5.18. It is claimed that with no relaxation of hard constraints such as a 1nm buffer for primary navigation routes and a 12 nm coastal buffer zone, up to 80GW could be developed.
14. Our assessment suggests that significantly less than 25GW could be developed under the Round 3 process, which would make it extremely difficult for the UK to meet the 2020 legally binding target for renewable energy.
15. For example, it is notable that 58% of the 25GW total is assumed to be delivered from the Dogger Bank zone. But the development of such a large proportion of the Dogger Bank area within the Renewable Energy Zone (REZ) seems at odds with the potential restrictions which might accrue should the area become designated as the result of an appropriate assessment. Equally, development of such a large proportion of the area would undoubtedly lead to significant cumulative effects.
16. We strongly recommend that these recommendations are reviewed and that a more balanced approach is taken as we have set out above.

Next steps

17. There is an urgent need for the SEA to dovetail with the general timetable for awarding zones under the Crown Estate Round 3 process. It is therefore important to finalise the SEA in a reasonable timescale having ensured that a proper process has been followed.
18. As a potential developer in Round 3 we are also seeking comfort on the approach that would be taken when further information is provided from survey work that would be undertaken within a zonal development area. What will be the feedback loop into the SEA process? We would like to discuss this along with a number of other issues that we have identified and will be in touch shortly to arrange a meeting.

DECC SEA Offshore Energy – Comments made on behalf of Eastern Sea Fisheries Joint Committee

Section 5.7.5. Fishing interactions and Appendix 3 (Other users of the Sea) part h.13 Fisheries

These sections identified key issues relating to fishing interactions with OWF developments. Those of particular relevance to inshore fisheries (and therefore to Sea Fisheries Committees) include:

- Many inshore areas are of great local significance, but this is often not reflected in MFA landings statistics, logbook returns, VMS or overflight surveillance data;
- Loss of fishing grounds to other marine users is difficult for smaller inshore vessels to overcome, because of their limited range;
- Displacement of fishing activity, e.g. resulting from OWF development, has a greater effect in inshore fishing grounds, with potential adverse effects (increase effort and competition) in neighbouring areas;
- Local inshore grounds may be particularly important for coastal communities whose fishing fleets depend upon these grounds;
- The ability to fish within OWF sites depends on the fishing vessel operator's perception of risk, the gear type being employed, local hydrodynamics and ground type;
- Early [and continued] liaison with local fishermen is very important.

The Joint Committee would emphasise the importance of direct liaison between fishermen and developers, to ensure these issues are understood at the local and regional level. This is likely to be of more relevance to export cable routes (traversing inshore areas) than OWF sites themselves if Round Three sites will generally be sited offshore. However, as identified from the SEA Fisheries Stakeholder workshop (October 2008), inshore fishing vessels can fish waters up to about 25nm offshore, and the geographical area important for fish populations targeted by inshore vessels can extend far beyond the inshore fishing grounds.

The SEA Environmental Report (p.163) noted that *“At a strategic level, caution is required with regard to the siting of major expansion of offshore wind farms to ensure fishing activities and skills of local cultural importance in an area are not inadvertently lost, through the prevention or significant hindrance of fishing activity for a generation during the lifetime of the windfarms.”* The Joint Committee considers this point to be important, but would query how this caution will be applied at the strategic level. One possible solution is the creation of detailed fisheries maps using information provided by fishermen.

The need for fisheries mapping was identified at the October 2008 fisheries workshop (highlighted by representatives of various organisations including National Federation of Fishermen's Organisations, Scottish Fishermen's Federation, Thanet Fishermen's Association, Maritime and Coastguard Agency, and Sea Fisheries Committees); and was discussed at the recent FLOWW meeting (March 2009). A national review of fisheries mapping work could highlight the information already available and identify the gaps yet to be filled.

It was also noted at the Fisheries Workshop that dedicated monitoring of fishing activities in operational wind farms would inform the SEA on impacts to fisheries from future OWF developments. Some reports were available of fishing activities within existing OWFs but the information was limited. The Joint Committee suggests that a requirement could be placed on developers/fishermen/regulators to monitor and report fishing activity within OWFS. It is

noted that the use of VMS on smaller fishing vessels (<15m) would considerably help this task.

Two further points that were made at the Fisheries Workshop but were possibly omitted from the SEA Report were:

- Need to investigate opportunities for OWF developers to mitigate / compensate fisheries via “beneficial fisheries projects”;
- Cables through trawling areas must be buried.

Section 5.5.2.6 Electromagnetic Fields (EMF)

In the absence of the final COWRIE EMF Phase 2.0 report, the EMF summary provided in the Environmental Report was useful. It highlighted the remaining uncertainty over electrical and or magnetic field impacts on fish and other marine species; noting that the mechanism for impact is present but the actual potential for impacts to occur was not definite. It emphasised the need for further research, some of which would be conducted at existing OWF sites in the next 1-2 years, and the need for proportionate attention to the issue in localised areas important for key species such as elasmobranchs. Fishermen in the Joint Committee’s district have raised this issue, and the uncertainty remains a cause of concern for the Committee, given the large amount of inter-turbine and export cabling planned for the developments within or through the district.

SEA Report: comments on recommendations and monitoring

Recommendation	ESFJC comment
Preferred option: Alternative 3 “to restrict the areas offered for licensing or leasing, temporally or spatially”.	The Joint Committee considers offshore wind farm development should be gradual and appropriate, informed by outcomes of relevant research into its environmental impacts. However, given the inevitability that a massive expansion in offshore wind will be progressed rapidly, ESFJC supports the option to restrict areas for development because of socio-economic and environmental considerations.
“Potential for significant effects (on the regional distribution of features and habitats; population viability and conservation status of benthic species) is considered to be remote”	Local/regional effects must still be considered in individual environmental assessments, e.g. proposed Race Bank OWF area = regionally important crab breeding ground, that is understood to play an important role in sustaining the Norfolk crab fishery.
Recommendation that waters near the coast and certain especially important fishing areas offshore are avoided for future OWF siting	ESFJC agree with this recommendation.
Recommendation 2 “should be presumption against OWF developments which occupy recognised important fishing grounds, in coastal or offshore areas, where this would prevent or significantly impede previous activities”.	ESFJC agrees with this approach, but the wording leaves room for debate on what are “recognised important fishing grounds” and whether the presence of OWFs will “prevent or significantly impede previous activities” – especially in light of the paucity of spatial information, or historic records, on fishing activities.

Recommendation	ESFJC comment
Recommendation 3 “precautionary approach: avoidance of important ecological areas...”	Sentence unfinished? ESFJC would expect to say, “Precautionary approach... ..is required”.
Recommendation 4 – Large area required for massive expansion in OW energy, therefore locate bulk of new generating capacity outside of 12nm.	ESFJC agree with this recommendation; a presumption against inshore development is likely to benefit <i>inter alia</i> inshore fisheries, coastal seascape, and coastal birds.
Recommendation 5 “in order to minimise habitat change, and ensure areas are left fit for previous or other users, minimise the use of rock armour/ scour protections...”	ESFJC support this recommendation.
Recommendation 7 “need cross-industry coordination to facilitate (i) assessment of cumulative effects and (ii) implement temporal / spatial mitigation.”	ESFJC supports this approach; it is crucial that any system is set up properly and engages all developers. Could this be written in as a licence / leasing condition?
Recommendation 9 recognised many data gaps, including these relating to fisheries: (i) distribution of fish eggs and larvae, and their variability over time; (ii) finer scale distribution of fishing effort, gears and catches for <15m vessels; (iii) effects on fishing activity in and immediately adjacent to constructed OWFs.	ESFJC suggests that possible solutions include: (i) expansion and updating of Coull <i>et al</i> (1998)’s Fisheries Sensitivities Maps (possibly using information gathered in oil & gas/OWF/other environmental surveys); (ii) Nationally-coordinated fisheries mapping project; (iii) requirement on developers/fishermen/regulators to monitor and report fishing activity within OWFS. Use of VMS on smaller fishing vessels (<15m) would considerably help this task.
Recommendation 14 “locate OWFs in MCZs where their objectives are coincident, to reduce potential spatial conflict with other users of the sea.”	ESFJC would support this approach but note that each development must be assessed individually for its effects.
Effects monitoring - “existing monitoring activity is reviewed as part of the DECC SEA process and to date has been found adequate to understand the evolution of baseline conditions in respect of sediment contamination and biological effects across the SEA areas”.	ESFJC would disagree with this point, and considers that existing monitoring data is not adequate to show how biological baselines have changed since OWF construction. E.g. baseline surveys at individual wind farm sites are not believed to be sufficient to provide species population data: although the diversity of species is recorded, the baseline and monitoring surveys are not frequent or extensive enough to detect/ascertain causes of change in population abundance; in the context of mobile and naturally variable populations.

The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

Letter sent per e-mail to sea.2009@berr.gsi.gov.uk

Date: April 20, 2009
Subject: Offshore Energy SEA Consultation

Dear Madam or Sir,

Econcern / Evelop would like to thank DECC for the opportunity to share our views on the SEA as conducted by DECC. Econcern, being a BWEA member, also has separately provided input to the consultation response prepared by BWEA. The response presented in this letter is complementary to and further in support of the BWEA response.

The content of our response to the SEA consultation is considered confidential¹. The fact that Econcern responded is not considered confidential.

Econcern's mission is 'a sustainable energy supply for everyone'. Econcern consists of operating companies Ecofys, Evelop, Ecostream, Ecoventures and OneCarbon. Together Econcern and its operating companies deliver unique projects, innovative products and services for a sustainable energy supply. Within Econcern, Evelop is responsible for the development of offshore wind energy projects.

Wind energy project development, construction and operation are core components of the implementation of our mission. We have been active in the renewable energy field for 25 years and have significant wind energy activities in 12 countries, onshore and offshore. Econcern currently operates the 120 MW Princess Amalia Wind Farm, the largest offshore wind farm in the Netherlands and is planning construction of first phase of the 330 MW Belwind Wind Farm off the coast of Belgium this year. In addition, we have a large portfolio of other offshore developments throughout Europe. In the UK, we are active both offshore and onshore. Offshore Econcern has been involved in the Scira project (Sheringham Shoal) until consented and is bidding for Round 3.

¹ This letter shall be considered exempt from disclosure to any third parties under the FOIA. In the event a request is made to DECC by any third party to reveal any information originated by Econcern, whether under the Freedom of Information Act 2000 (FOIA) or not, Econcern requests DECC to timely notify Econcern in writing of any such request.

Offshore wind energy contributes to the reduction of CO₂ emissions, provides increased security of supply and brings economic development. In addition, wind energy generally causes less pressure on the environment in terms of waste, air pollution or heat disposal than nuclear or fossil fuel based electricity generation.

In this light, it would not be surprising had the SEA recommended a “presumption in favour” of offshore wind energy. This is however not the case. Although E-concern considers the SEA in general to be a valuable document which provides important information to improve our knowledge of UK marine environment characteristics and to support the considered selection of locations for offshore wind energy development in the UK waters, we feel constrained to respond to the SEA in particular in regard to the general “presumption against” offshore wind energy. As presented in the SEA recommendations, the presumption could be interpreted in the wrong way.

The evaluation of offshore wind energy should, in our view, be project specific and not take general presumptions as the starting point. Further, the evaluation should be done taking full account of the impact of the failure to develop offshore wind energy into account. We are concerned that otherwise the SEA recommendations will have a discouraging effect on decision-making. We presume that this is not the intention of the SEA. We would therefore recommend a more positive approach and suggest modifying the overall “presumption against” position into “yes, with appropriate consideration of alternatives” within the non-excluded areas. This approach would be more consistent with the existing regulatory instruments which allow the proper assessment of project specific conditions.

We have limited our response to specific recommendations as included under section 6.1 of the OES Environmental Report:

1. Regarding Recommendation 2: We acknowledge the importance of balancing potential negative effects on the environment and other users of the sea against the many benefits of offshore wind farms. We also recognise that each offshore wind energy project has unique characteristics. This is recognised in the existing consenting process. Alternative 3 (spatial exclusion) would not eliminate the requirement for EIA and stakeholder consultation for the non-excluded areas. In that respect Recommendation 2, as currently phrased, may unnecessarily be interpreted as a more general statement against licensing offshore wind farms. Recommendation 2 also appears to assume a fixed status quo, e.g. that there are no conceivable alternatives to existing commercial navigation routes or that fishing in existing grounds will continue uninterrupted and unaffected by other developments, for instance quotas and changes in EU fisheries rules.

2. Recommendation 3 states: "This precautionary approach dictates that unless suitable evidence indicates otherwise, avoidance (for the present) of areas known to be of key importance to waterbird and marine mammal populations, including breeding colonies, foraging areas and other areas essential to the survival of populations...". This recommendation may refer to the existing process for defining protected areas and the assessment of the impact on these areas (e.g. SACs or SPAs under the European Birds and Habitats directives). As stated in Recommendation 15, these sites are not intended to be strict no-go areas. The emphasis in Recommendation 3 on the application of a precautionary approach could be interpreted as an additional level of assessment effectively excluding development in these areas.
3. Recommendation 4 introduces the 12nm criterion. Although it is clear this should not be considered an exclusion zone, E-concern has concerns about this recommendation. It is in our view not possible and not necessary to introduce this 12nm criterion. Firstly because coastal areas and seascape are unique and difficult to compare or generalise. Secondly, we consider 12 an arbitrary number, that coincides with the territorial waters boundary. Each project should be considered in its own specific environment and the impact assessed accordingly. There is a clear economic advantage to near shore construction² that, in our view, should not be risked by the general nature of Recommendation 4.
4. Under Recommendation 4 it is mentioned that "Detailed site-specific information gathering and stakeholder consultation is required before the acceptability of specific major Round 3 or subsequent wind farm projects close to the coast can be assessed". In our view this is already the case. Environmental Impact Assessment and stakeholder consultation requirements are already in place. It is unclear if this recommendation adds a new layer of investigations and consultation or this refers to the existing consenting process.
5. In Recommendation 7, the OES Environmental Report mentions the requirement to coordinate seismic and piling activities to mitigate cumulative effects of noise. E-concern would like to point out that the construction planning of offshore wind farms is done well in advance and interruptions of the installation process can be extremely costly and may delay the delivery of the project considerably. Any coordination procedure related to e.g. seismic activities should take this into account.

² The Carbon Trust, "Offshore wind power: big challenge, big opportunity. Maximising the environmental, economic and security benefits", October 2008.

In summary: Econcern suggests a clear balance between the positions taken in the recommendations of the OES Environmental Report and the main objectives of the draft plan/programme:

“... to enhance the UK economy, contribute to the achievement of carbon emission reductions and security of energy supply, but without compromising biodiversity and ecosystem function, the interests of nature and heritage conservation, human health, or material assets and other users.”

The emphasis in the Recommendations on the presumption against offshore wind farms may have a paralysing and unnecessary cost increasing effect on offshore wind energy development. Econcern’s experience in these matters indicates that each project is unique and with involvement of stakeholders potential issues can often be mitigated.

Yours faithfully,

Evelop International BV

Bob Meijer MSc

Project Manager Round 3

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86 to 88 Guild Street
Aberdeen
AB11 6AR
Email sea.2009@berr.gsi.gov.uk
22 April 2009



Response to the Consultation on Offshore Energy Strategic Environmental Assessment (SEA), a draft 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 depleted oil/gas reservoirs

EDF Energy welcomes the opportunity to comment on the Offshore Energy Strategic Environmental Assessment (SEA) Consultation. We support the UK Government's ambition to move progressively to a low carbon economy and we believe that offshore wind farms will play a significant role in achieving this ambition.

We would like to draw your attention to key issues that we have raised in our response to the consultation which is appended to this letter.

The 2009 Offshore Energy SEA, in comparison to the 2007 SEA Offshore Wind Energy Generation: Phase 1 Proposals, does not present conclusions in the form of spatial mapping. The mapping was extremely helpful in identifying potential areas for development. EDF Energy feel that this provided a good starting point for Environmental Impact Assessment (EIA) and it is unfortunate that the current SEA does not draw such conclusions.

In the 2009 SEA report, a proposal that highlights the lack of spatially-specific analysis is the proposal to create a "blanket" 12 nautical mile (nm) coastal "buffer" zone. We are concerned that the evidence base and the quantified reasoning for this measure have not been presented. We feel that it will be impossible to determine whether or not a particular development would – or would not – be acceptable within this zone. This approach is likely to impede the development of offshore wind generation.

Please do not hesitate to contact myself or David Acres on 020 3126 2326 if you have any questions.

Yours sincerely,



Ravi Baga
Head of Policy, Regulation and Environment,
Energy Branch

EDF Energy Response to DECC's Consultation Offshore Energy Strategic Environmental Assessment

EDF Energy is one of the UK's largest energy companies with activities throughout the energy chain. Our interests include offshore and onshore wind, nuclear, coal and gas-fired electricity generation, combined heat and power plants, electricity networks and energy supply to end users. We have over 5 million electricity and gas customer accounts in the UK, including both residential and business users. We are also part of the EDF Group, one of the world's largest energy companies.

EDF Energy is fully committed to tackling climate change. We support the UK Government's ambition to move progressively to a low carbon economy and to play a leading role in the global effort to address climate change.

EDF Energy believe that offshore wind farms play an important part in fuel-mix diversity for security of electricity supply in the UK. We welcome the opportunity to respond to the Department of Energy and Climate Change (DECC) consultation:- *Offshore Energy Strategic Environmental Assessment (SEA), a draft 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 depleted oil/gas reservoirs.*

The objective of the SEA is clearly stated. However, the report fails to consider the positive environmental implications of current and future wind generation and does not analyse the implications on the environment of not deploying 25GW+ of Round Three offshore windfarms.

We have compared the 2009 Offshore SEA report with previous offshore wind SEA assessments, in particular the 2007 SEA on Offshore Wind Energy Generation: Phase 1 Proposals.

This previous assessment presented conclusions in the form of spatial mapping of the sum of ranked scores of socio-economic, ecological and visual constraints (see Figure 21 in Annex 2 of the 2007 SEA). This presentation was extremely useful in identifying the relative sensitivity of different offshore areas. It highlighted those areas where development would be most challenging and those areas with relatively few constraints. It provided a sound starting point for the environment impact assessment of a specific development proposals, as it provided information for each location.

In contrast, the current SEA under consultation does not draw spatially specific conclusions. It does provide an extensive description of the categories of impact, but does not address the relative risk that these will arise in any given area in practice.

A spatially-based set of findings, along the lines of the 2007 SEA, would be an extremely useful addition to the current exercise.

A significant development in this 2009 SEA report, which highlights the lack of spatially-specific analysis, is the proposal to create a "blanket" 12 nautical mile (nm) coastal "buffer" zone. The proposal states that projects over 100MW in size are to

be sited outside the 12nm limit to minimise the impact on the landscape/seascape. The reasoning behind this new constraint is vague. The headline explanation is that, by implementing the measure, the Government is:

“... recognising the relative sensitivity of multiple receptors in coastal waters ...”
We are greatly concerned by the lack of detailed evidence to underpin this proposal. The SEA states that the zone is not intended to be an absolute exclusion zone. However, because the evidence base and the quantified reasoning for this measure have not been presented, it will be impossible to determine whether or not a particular development would – or would not – be acceptable within this zone.

We recognise the concern underlying this policy proposal. In some locations there is a particularly large challenge to balance the many activities, environmental factors and amenities in coastal waters. However, in other areas, the challenge is far more open to successful management. New uses can be accommodated because mitigation measures can resolve the potential conflicts.

Therefore, rather than take a “blanket” approach, the combination of factors should be mapped to identify those areas of most potential concern, following the approach taken in the 2007 Round 1 SEA.

This is an important debate and decision, because a “blanket” zone approach will obstruct the development of offshore wind generation.

Such a zone would greatly increase the uncertainty for developers, and therefore the project risk. As a result, many areas inside the zone that could be developed without significant impact will not be taken forward, as areas outside the zone will have inherently lower development risk. The lack of transparency over the basis of the zone will prevent developers from assessing the acceptability of a particular area of development.

From the perspective of UK renewable energy policy, the SEA recommendation is not consistent with the UK Government's ambition to meet its renewable energy targets in part from utilising its territorial waters around England and Wales. There is the potential to build an additional 20-25GW production capacity of offshore wind energy by 2020. Based on the Sinclair Knight Merz (SKM) report supporting the UK Renewable Energy Strategy (RES) consultation 2008, a capacity of 25GW for offshore wind by 2030 is consistent with the overall renewable energy strategy.

The 2009 SEA (Section 5.7.2) confirms that the buffer zone would remove around 60% of the candidate areas for offshore wind development. This is likely to be an underestimate of the actual impact of such a zone, as the near-shore sites are among the lowest cost locations for development (the water depth is generally shallower and transmission distances are shorter). In contrast to these significant adverse impacts on future renewable generation development, the SEA does not quantify the benefits that a buffer would deliver, so it is impossible to assess whether this measure is appropriate.

This 'buffer zone' presents further confusion by recommending that exclusion should apply for ">100MW", and in the conclusions section concludes that the 'bulk' should be located outside 12nm. 'Bulk' is an ill-defined term, and it is not clear whether this applies on a site-by-site or 'all of Round 3' basis. Denmark, a country with one of the longest records of operating offshore windfarms (Denmark, Horns rev, 2001, 14km offshore) are now recommending that windfarms are constructed

closer-to-shore on both economic and lack of visual sensitivity grounds. The SEA should be re-written on a scientific basis to clarify the inconsistencies associated with this conclusion as it presents potentially fatal uncertainty to developers, stakeholders, and decision makers alike. Rather than a blanket statement, appropriate assessments on the zones would be a more constructive way to inform the decision makers.

The Marine Bill will create a strategic marine planning system that will clarify European and Governmental objectives and priorities for the future.

Measures such as zones of restricted development should be developed, determined and implemented by the new Marine Management Organisation (MMO), which is to be established under the Marine Bill.

SEAs should provide information on environmental impacts and scope for mitigation on a spatially-specific basis, to support the MMO's decisions regarding marine policy.

On a particular point of detail, in our view it is a misconception that construction and operation of turbines necessarily adversely impact the near shore marine environment significantly, as is suggested in Chapter 5.4 of the SEA Environmental Report. The analysis in the SEA itself states that turbine bases will increase habitat heterogeneity and there would be negligible or no detectable impacts from changes in the hydrodynamic regime on marine communities or the seabed sediment. The SEA Report also states that marine communities will recover from temporary disturbance of sediments affected by turbine construction.

The SEA represents a good assembly of the issues surrounding various aspects of the environment associated with construction and operation of windfarms in the marine environment, and in particular with respect to Round 3. It is acutely evident that some of the viewpoints/conclusions clearly represent the "consultant's" opinion and level of understanding and does not necessarily reflect best international practice and understanding of the issues surrounding offshore windfarms.

The SEA takes the view on shipping that shipping sterilizes vast areas of seabed for development of windfarms. The SEA is being excessively cautious and tighter margins between shipping and turbines are perfectly adequate. The suggested spacing of Round 3 wind turbine developments is upwards of 1km, which would leave adequate space for most shipping.

The report mentions the potential for offshore windfarm to be beneficial to fish stocks, but it fails to expand on this in relation to international fisheries and locally significant fisheries. In combination with the 12nm 'constraint' this would seem to benefit non-local fishing communities (which rarely venture beyond 12nm).

The SEA does not give any precise siting constraints surrounding civilian and military radar. Limits for consultation with the relevant authorities should be identified in the SEA to avoid confusion.

The report presents a presumption against offshore wind developments which result in a significant detriment to tourism, recreation and quality of life without any

quantification of these factors. This is clearly a subjective issue and clarification should be provided as to how this will be assessed.

The SEA provides no defined mechanism or process to complete data sets that are incomplete. Development should not be used by stakeholders to obtain new data for unmapped areas, but should only provide data that is relevant and specific to inform the development in question.

The reported analysis of the environmental impacts comparing offshore oil and gas activities to windfarm activities is incomplete as it analyses only the emissions/climate change contributions from the construction/production of the respective energies. A complete analysis would include the impacts from use of the oil and gas (as it is almost exclusively consumed in the UK, not exported).

The SEA report contains a theme of presumption against renewable energy development that wherever spatial conflicts arise the offshore wind industry appears to be treated as lower priority than other industries.



Offshore Energy SEA Consultation,
The Department of Energy and Climate Change,
4th Floor Atholl House,
86-88 Guild Street
Aberdeen.
AB11 6AR

Wednesday 22nd April 2009

Dear Sir / Madam,

COMMERCIAL IN CONFIDENCE:

**Department of Energy and Climate Change - Offshore Energy SEA Consultation –
April 2009**

Response from EDP Renováveis and SeaEnergy Renewables Limited

EDP Renováveis and Sea Energy Renewables (EDPR-SER) are pleased to submit comments to The Department of Energy and Climate Change (DECC) in response to the recently published draft Offshore Energy Strategic Environmental Assessment (SEA) for consideration during this consultation period.

EDPR-SER has been set up to with the purpose of developing Offshore Wind Farms around the UK coast and initially to bid for zones under the Crown Estate's Round 3 tender.

EDPR-SER thanks DECC for the opportunity to provide comments and would welcome the opportunity to discuss further those aspects commented upon should DECC wish us to elaborate further.

Yours faithfully,


Daniel H Finch

Development Director

And Bid Manager Round 3

1. Acoustic Disturbance by Noise

The SEA discusses effects of pile-driving of turbine foundations, resulting in high source levels.

Early investigation of the ground conditions, and therefore early structure design, would assist in mitigating noise wherever possible. Mitigation measures are extremely important, as are investigations in to dispersal of mammals, particularly distant from shore. As with other potential environmental impacts the use of control areas to monitor impact will be crucial.

We would be happy to discuss the learning's we have experienced, including further technological advancements we have been pursuing on the impact of noise during piling, directly with DECC as part of separate discussions.

2. Physical Disturbance of Seabed Habitats

This section only mentions the possible disturbance of seabed habitats, but does not highlight the possible benefits associated with "Reef effect" and the protection from disturbance by others.

Details of this have already been highlighted by COWRIE on their website, which includes information on 'Life around the turbines'.

In addition, we would be happy to discuss areas of research we have been involved in, on this specific subject, as part of separate discussions.

3. Physical Presence of Offshore Infrastructure and Support Activities

We would strongly disagree with stipulating that "a coastal buffer zone of 12 nautical miles (some 22km) is recommended, within which major wind farm development would not normally occur".

We recognise that the siting of offshore wind farms away from the immediate coastline reduces the impact on the environment. But the environmental impact cannot be solely related to a specific distance from shore. There are too many variables which are not taken in to account in an arbitrary 12nm restriction, including the scale of a project. Decisions must be taken on a case by case basis and there will be many locations, particularly on the east coast of Scotland, where developments may occur within the Territorial Waters.

Site by site analysis, using site specific environmental analysis and surveys (as part of the EIA process), will ensure that each potential development site is properly assessed.

The SEA is at risk of setting a dangerous precedent, that no wind farm around the coastline of Britain may be sited within 12nm. Despite suggestions to the contrary, this does have a significant impact on the Scottish Territorial Waters sites.

Furthermore, this 'limit' has possible ramifications of associating this distance with the Territorial Waters boundary.

4. Landscape/seascape

As detailed in point 3 above, we disagree with the stipulated coastal buffer zone of 12 nm, without undertaking appropriate analysis and stakeholder consultation.

Setting out a buffer zone, even if this buffer zone is 'not to exclude wind farms from being built closer to shore', sets a precedent prior to any analysis of further consultation being undertaken.

Each individual site should be assessed on a case by case basis.

5. Other Users, material assets (infrastructure, other natural resources) - Fishing

With regard to fishing in the UK, the SEA states that, "[...]it is recommended that waters near the coast and certain especially important fishing areas offshore are avoided for future wind farm siting". No definition is provided on these areas or how they are designated, and we do not agree that a blanket restriction would be appropriate without consultation.

In the past, we have worked closely and successfully with the fishing industry, and wish to continue in this relationship.

We would ask that the SEA considers and clarifies the above, prior to any publication.

6. Other Users, material assets (infrastructure, other natural resources) – Military

Discussion has been ongoing for some time with regard to Government consultation with the military, specifically the potential impact on military radar. The SEA states that further discussion is required with the Government, out with the scope of the SEA.

It is absolutely imperative that his consultation is undertaken and clear guidance provided on the siting of wind farms, to avoid serious impact on the scheduling of wind farms, in line with the Government's 2020 targets.

We would ask that the SEA outline this and call for action to be taken as a matter of urgency.

7. Interrelationships – Cumulative Impacts

The recognition that there should be cross industry co-ordination to facilitate the assessment of cumulative impacts on several issues not least of which are visual impact and the effects of noise upon mammals is welcomed and has to be well managed.

The setting up of Control Areas and early base lining for studies should be undertaken at a national level and results be widely disseminated.

8. Interrelationships – Wider Policy Objectives

We would re-iterate the requirement for the Government and various organisations/bodies to work closely, to ensure that planning, marine obligations and various guidelines interface fully with one another.

In addition, seamless policies must be implemented across all jurisdictions, to ensure there are no conflicts or delays.

9. Conclusions and Recommendations

The precautionary approach dictating that “[...] *unless suitable evidence exists, areas known to be of key importance to waterbird and marine mammal populations should be avoided*” may be misused.

The SEA is non specific about “*key importance*” and does not allow the Appropriate Assessment process to consider the evidence generated through study as all wind development sites are required to do



ENGLISH HERITAGE

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

Our ref: DECC/SEA offshore

21st April 2009

Dear Sir/Madam,

DECC Offshore Energy Strategic Environmental Assessment Future Leasing for Offshore Wind Farms, Licensing for Offshore Oil and Gas and Gas Storage

Thank you for the invitation to comment on the Strategic Environmental Assessment of a draft plan/programme to enable further leasing for offshore wind and licensing for offshore oil and gas, including the underground storage of combustible gas in partially depleted oil/gas reservoirs. This response is not considered to be confidential.

Introduction

English Heritage is the Government's advisor on all aspects of the historic environment in England. We are a non-departmental public body established under the National Heritage Act 1983 to help protect the historic environment and promote awareness, understanding and enjoyment of it. Since our inception, English Heritage has been consulted on tens of thousands of planning, listed building, conservation area and scheduled monument consent applications. In the delivery of our duties we work in partnership with central Government Departments, local authorities, other public bodies and the private sector to conserve and enhance the historic environment; broaden public access to the heritage; and increase people's understanding of the past. We set out how we deliver these duties using our *Conservation Principles* as a framework for dialogue.

The National Heritage Act 2002 enabled English Heritage to assume responsibility for maritime archaeology in the English area of the UK Territorial Sea, modifying our functions to include securing the preservation of monuments in, on, or under the seabed, and promoting the public's enjoyment of, and advancing their knowledge of such monument. However, for activities that occur beyond the 12 nautical mile limit of the English area of the UK Territorial Sea any advice that we do offer is given informally only.

FORT CUMBERLAND, EASTNEY, PORTSMOUTH PO4 9LD

Telephone 023 9285 6735 Facsimile 023 9285 6701 www.english-heritage.org.uk

*Please note that English Heritage operates an access to information policy.
Correspondence or information which you send us may therefore become publicly available*



ENGLISH HERITAGE

Our responsibility under the Protection of Wrecks Act 1973, within the English area of the UK Territorial Sea, is to consider applications and recommendations for designation, re-designation and de-designation of shipwreck sites. On the basis of our advice the Secretary of State (Department for Culture, Media and Sport) is responsible for designating restricted areas around sites which are, or may be, shipwrecks (and associated contents) of historic, archaeological or artistic importance. The Secretary of State is also responsible for the issuing of licences to authorise certain activities in restricted areas that otherwise constitute a criminal offence. At the end of the Committee's reporting year in March 2008 there were 46 sites designated in the English area of the UK Territorial Sea. Further information on the designated sites is available on the English Heritage web site: www.english-heritage.org.uk/maritime. We also offer the following explanation of what we consider to comprise the marine historic environment.

The nature of the marine historic environment resource is complex and diverse, comprising much more than the remains of ships and boats. Sites and landscapes that were submerged by sea-level rise; the remains of other types of vessel, such as aircraft; scattered material relating to ships and shipping (e.g. lost cargoes, anchors, and debris fields); evidence related to coastal activity (e.g. resource exploitation); the sub-tidal elements of coastal features (usually relating to exploitation of, or defence from, the sea); and sea-bed emplacements (such as trans-oceanic communication cables and pipelines) all have the potential to inform us of our collective past.

Response to the SEA Environmental Report

We note that the conclusion to the SEA is for "Alternative 3" and with particular regard to future offshore wind farms "...the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km)..." Please note that, at present, there is no independent, public source of advice regarding the historic environment for the UK Continental Shelf adjacent to the English area of the UK Territorial Sea. Consequently, we have copied this response to DCMS should they wish to comment to you directly on this matter.

Table 4.1 (Environmental problems relevant to offshore oil & gas licensing and wind leasing) – we note that in the "implications" column that licensees should be "aware of areas of potential heritage value", but we wish to add that the licensee should also work to ensure, that where necessary, appropriate mitigation measures are implemented, in agreement with national curatorial advisors such as English Heritage.

Section 5.4.2 (Evidence Base) – we note the argument made regarding the potential for marine development projects to damage archaeological artefacts or other historic sites, but also how a correctly managed process of environmental evaluation can capture and place in the public realm additional information. We also note that while reference was made to the COWRIE 2008 publication on assessment of cumulative impact and the historic environment, reference should also have been made to the COWRIE guidance published in



ENGLISH HERITAGE

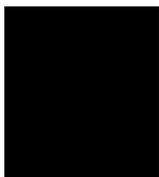
January 2007 entitled “Historic Environment Guidance for the Offshore Renewable Energy Sector”.

Section 5.4.5 (summary of findings and recommendations) – in general we are prepared to concur, but we stress that “archaeological sensitivities” should be considered inclusive of access to the information generated and therefore the adequacy of the public archive is crucial; this matter should be considered particularly acute for marine development that occurs outwith of the UK Territorial Sea and thereby beyond the statutory remit of a public body, such as English Heritage’s National Monuments Record.

Section 5.16 (Alternatives) – in reference to cultural heritage we add that, in itself mitigation “...through preparatory survey work...” does not constitute sufficient mitigation. We therefore qualify this statement by adding that it is through commissioning archaeological interpretation of survey material (e.g. geophysical and geotechnical data), gathered in a manner conducive to this analysis, that delivers mitigation.

6.1 (Recommendations) – in recommendation No. 14 we noted the statement regarding “...the objectives of the conservation sites and renewable energy development are coincident...”, but add that any consideration of “conservation sites” should also consider the implications to historic environment features. We add that an additional recommendation should be included regarding the deposit in a public archive of all information generated in support of marine development projects located within the UK Territorial Sea or UK Continental Shelf.

Yours faithfully,



Dr Christopher Pater
Maritime Archaeology Team

Cc Duncan McCallum (Policy Directory, English Heritage)
Ian Oxley (Head of Maritime Archaeology Team, English Heritage)
Stephen Trow (Head of Rural and Environmental Policy, English Heritage)
Annabel Houghton (DCMS)

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

16th April 2009

Dear Sir/Madam

Re: Offshore Energy Strategic Environmental Assessment Consultation

We welcome the opportunity to respond to the Department of Energy and Climate Change consultation on the Environmental Report for the Offshore Energy Strategic Environmental Assessment (SEA).

We support the use of the SEA process to help inform offshore energy licensing and leasing decisions by fully considering the environmental implications of the proposed plan/programme.

The Environment Agency is committed to helping the UK meet its target of sourcing 15% of energy from renewable sources by 2020 in a sustainable way. We support low-carbon based energy generation which results in positive impacts on climate change, air quality and biodiversity.

We are pro-actively engaging with industry and Government to help deliver sustainable renewables through efficient regulation, helping identify opportunities and constraints, and developing advice on best practice.

Government policy should seek to deliver sustainable offshore energy projects, through ensuring compliance with environmental legislation, avoidance of unacceptable environmental impacts, and delivery of significant greenhouse gas emission savings.

Our key messages

We strongly support the ambitious target of generating 15% of the UK's energy from renewables by 2020.

We would like to see the SEA process effectively inform the licensing and leasing decisions so that the most sustainable options are chosen and any mitigation measures are effective.

The SEA should consider the environmental implications of the potential exploration, development and energy production activities, particularly with reference to the requirements of European Directives and associated UK Regulations. This should lead to DECC taking forward a plan/programme that meets environmental outcomes through a better informed selection process based on sound evidence and clearly defined environmental objectives.

We generally agree with the approach used for the SEA. However, we have a number of recommendations to ensure that the SEA process achieves the objective of creating a sustainable outcome for the development of offshore energy projects.

We will continue to work with Government to ensure that energy policy reduces greenhouse gas emissions and does not cause unacceptable environmental impacts.

We recommend that:

1. All offshore energy projects comply with environmental legislation

Government should facilitate this process through working with others, including ourselves, to deliver a combination of direct, project-specific advice and information on best practice design and siting of offshore energy facilities.

2. Cumulative impacts are fully considered

The Offshore Energy SEA must be considered within a wider policy context. Links must be made to the emerging National Policy Statements and their Appraisals of Sustainability, the Severn Tidal Power feasibility study and SEA and planned Energy White Paper. Cumulative environmental impacts need to be considered in the light of all these potential future developments, including impacts on biodiversity. Particular regard should be made to the potential cumulative effects at a project level of clusters of licensed activities, and related impacts of tidal or wave energy installations, or offshore carbon repositories. This needs to be considered both for offshore activities and related on-shore development.

3. Effective mitigation measures are implemented

The preferred option of restricting the area offered for leasing and licensing spatially will require a number of mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea. The impacts of proposals regarding precautions, areas to be withheld, and operational controls need to be fully considered. Informed decisions must be made based on sound data and evidence to result in the best environmental outcome.

4. Positive environmental impacts and improvements are optimised

Opportunities should be identified for the leasing and licensing activities to provide environmental improvements, and not just mitigation of adverse effects. These opportunities should be sought both offshore and onshore.

5. All relevant environmental objectives required under the Water Framework Directive and Marine Strategy Framework Directive are fully considered

We are pleased to see the links to the Marine Strategy Framework Directive requirement for Good Environmental status, and the Marine Bill regarding marine planning. More emphasis needs to be made on meeting environmental objectives required under the Water Framework Directive.

6. The SEA refers to the inventory that is used by Defra to demonstrate compliance with the international air quality legislation

The EC National Emissions Ceiling Directive and the Gothenburg Protocol set national limits to be achieved in 2010 for nitrogen oxides, sulphur dioxide and volatile organic compounds.

We would like to see the SEA processes reflect good practice as detailed in Government and our own guidance. We recommend considering our SEA best practice guidelines:

<http://www.environment-agency.gov.uk/research/policy/32903.aspx> which provide practical advice on carrying out SEA, and our SEA and climate change guidance for practitioners: http://www.environment-agency.gov.uk/static/documents/Research/seaccijune07_1797458.pdf.

Please contact my colleague, Sophie Goodall, Environmental Assessment Policy Advisor, on 01903 832147, if you require any clarification or information on this response.

Thank you for considering our recommendations and comments.

Yours faithfully



Tony Grayling
Head of Climate Change and Sustainable Development

Environment Agency, Millbank Tower, 25th Floor, 21/24 Millbank, London, SW1P 4XL

Offshore Energy SEA Consultation,
The Department of Energy and Climate Change,
4th Floor Atholl House,
86-88 Guild Street,
Aberdeen,
AB11 6AR

Monday 20th April 2009

Dear Sir / Madam,

**COMMERCIAL IN CONFIDENCE: Department of Energy and Climate Change Offshore Energy SEA Consultation.
Forewind Response**

Forewind is pleased to submit comments to The Department of Energy and Climate Change (DECC) in response to the recently published draft Offshore Energy Strategic Environmental Assessment (SEA) for consideration during this consultation period.

Forewind is a four-way joint venture company comprising of Airtricity, NPower Renewables, StatoilHydro and Statkraft, and has been formed as a response to The Crown Estate's Round 3 offshore windfarm programme.

Forewind welcomes the publication of the DECC Offshore Energy SEA in helping to assess the likely environmental constraints and data gaps/information requirements for offshore wind energy in UK waters. Forewind recognise that the SEA forms a framework which will support future considerations for offshore projects requiring EIA and the associated licence applications. Therefore it is important that any conclusions are clear and concise, and that the assumptions used in making these conclusions are transparent. Where there is any conflict or disagreement in the methodological approach applied to the SEA, Forewind believes that this should also be stated plainly in any final document to ensure that the SEA high level approach does not unnecessarily exclude areas where more detailed studies and analysis can show that these are acceptable.

Forewind has divided its response into clear sections, outlined by the following headings:

- Environmental Information and Data Gaps;
- SEA Screening Criteria used for Spatial Mapping;
 - i. Constraints which are inconsistently reported in the SEA and/or should be revisited in terms of existing practical examples.
 - ii. Criteria where an alternative approach to determining hard constraints is recommended.
- Other Issues; and
- Main Messages from Forewind.

These sections outline and examine the points which raise concern for Forewind and their likely impacts on future offshore renewable energy developments. Forewind raises questions regarding outcomes of the SEA and encourage DECC to take into consideration the concerns put forward within this response.

In summary, Forewind would like to draw attention to the following main conclusions –

- The 12nm coastal buffer needs to be based on more evidence to ensure it is applied for the correct reasons and is not restrictive to future offshore wind energy development and hinder the achievement of 2020 aspirations.
- The navigation and shipping guidance should be supported by further data to ensure that the large generalisations made are appropriate.
- The 6nm buffer zone surrounding oil and gas infrastructure should be assessed on a site by site basis and this should be outlined within the SEA.
- Forewind would like to reiterate that it is appreciative of the opportunity to provide feedback to DECC on the Offshore Energy Strategic Environmental Assessment and looks forward to receiving the final document later in the year.

Forewind would like to thank the Department of Energy and Climate Change for the opportunity to provide comments and looks forward to receiving the final SEA this summer.

Yours sincerely,

Forewind.

Forewind has conducted an extensive and detailed screening exercise for the Round 3 bid process, based on the zones offered for bidding, at a significantly more detailed scale and analysis than for the SEA. Accordingly, Forewind has uncovered differences between the recommendations of the SEA and the results obtained from the screening of the zones. Within the below paragraphs, Forewind has outlined these discrepancies.

Forewind believe that the SEA would benefit from a clear statement advising on the limitations of the assessment and that fundamentally all detailed assessments for the development of offshore energy installations will need to be undertaken at a site specific level.

Environmental Information and Data Gaps

The SEA report identifies a number of subject areas where baseline information is limited and Forewind would advise that these will need to be enhanced to support future marine spatial planning and project-specific consenting. These include:

- Seabed topography and texture. For some areas there is excellent data, for example from multibeam mapping undertaken by the MCA, BGS and the SEA programme, but the UK lacks a coordinated programme to marshal such data, to identify priority gaps and to find ways to fill them;
- Recent information on the distribution of fish eggs and larvae, and variability in space and time;
- Detail of bird migration patterns, and variability in space and time including flight heights in different weather conditions;
- An understanding of the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs;
- Ecology of most marine mammal species and in particular important areas for breeding, foraging and resting.
- Finer scale distribution of fishing effort, gears and catches for smaller vessels (<15m);
- Precision on the offshore distribution of shipping (AIS data coverage typically only extends 80km from shore); and
- Effects on fishing activity in and immediately adjacent to constructed wind farms.

It would be beneficial for the SEA to expand on how these data gaps may be filled, and who would take a lead role in funding and managing data gathering exercises.

SEA Screening Criteria used for Spatial Mapping

- Constraints which are inconsistently reported in the SEA and/or should be revisited in terms of existing practical examples**

Navigation

1nm buffer around primary shipping routes as identified by the SEA using 2007 AIS data

Within the SEA, analysis of Automatic Identification Systems (AIS) data identifies primary navigational routes for shipping based on data taken in 2007. A 1nm buffer is then suggested to be applied to the routes based on the

‘high’ to ‘medium’ risk threshold, as defined in the shipping route template in Annex 3, Template for assessing distances between wind farm boundaries and shipping routes of Marine Guidance Note 371. The SEA suggests that a larger buffer may be required where *‘additional factors such as traffic density and tidal set increase local risk’*.

Forewind is concerned that the data set analysed for the SEA consists only of 4, one week periods – a significantly short ‘snapshot’ in which to characterise an area and make informed judgements. Forewind would like to lobby for a longer duration data set (for example one year of full data) to be collected and used to inform the SEA recommendations – at the moment there is a risk that the small amount of data collected could be anomalous within a much larger dataset.

Forewind would also like a clear justification of the method of analysing the AIS data. It appears from a comparison that the SEA has applied a lower threshold of density during their analysis than is standard within the offshore wind industry for EIA navigation risk assessment and given in guidance from Anatec. Forewind would normally consider over 4 vessels a day to be significant. This results in wider shipping lanes that would be necessary for safe transiting around a wind farm site. In addition once a 1nm buffer is applied to the route, it exacerbates the differences.

Forewind would like to draw attention to page xvi of the non-technical summary, which states that “windfarm siting should be outside areas important for navigation (these are mapped in the Environmental Report)”. Forewind believes that this could potentially create complete exclusion areas for windfarm development and would like to lobby for this paragraph to be rephrased.

Forewind would promote the periodical review and refinement of shipping lanes to ensure an accurate view of the actual shipping activity is always maintained.

Page 159 addresses the possibility for a 24 month survey period for ship traffic to include seasonal variations. If such time period is needed, this activity will be amongst the most time critical paths for development and consequently should be initiated early by the developers. It is therefore necessary to have early clarifications of the need for shipping surveys and discussions with relevant stakeholders. Forewind would like to see clarification in the SEA as to why this surveying has been put forward, given the electronic surveillance systems in place (AIS).

Section 6.1, states that “there should be a presumption against offshore windfarm developments which impinge on major commercial navigation routes or **cause appreciably longer transit times**”. Forewind would like further clarity as to what “appreciably” longer means. In addition, any calculation of the percentage impact on transit times should look at impact on the entire journey, not just the impact on the affected journey section. For instance, if the presence of an offshore wind farm causes a vessel on a 40 hour journey to take an additional 2 hour over a previously 5 hour section, this should be a $2 / 40 = 5\%$ impact, not a $2 / 5 = 40\%$ impact on the transit time.

Coastal Buffer

Presumption that the bulk of windfarms should be sited outwith 12nm of the UK coast.

The SEA identifies an area, extending to 12nm from the coast, where development of offshore windfarms of over 100MW in size are typically prohibited for a variety of reasons including impacts on landscape and seascape, coastal fishing, tourism and recreation and coastal ecology. Although Forewind is aware that development within this 'coastal buffer' area is not excluded *per se*, Forewind has concerns about the potential disadvantageous effect it could have on development around the coast (i.e. in fostering a 'presumption against development' without proper assessment).

Forewind would initially like to indicate its feelings of unease over the arbitrary 100MW windfarm figure. Within the SEA non-technical summary, page xiv, it notes that for reasons of landscape/seascape, windfarms larger than 100MW in size should be sited outwith 12nm from the coast. Forewind would like to see within the SEA a reasoned justification to this 100MW figure as it believes that a threshold of numbers of turbines (rather than MW) would be more appropriate for landscape/seascape issues.

Forewind is apprehensive of the concept of a 12 nautical mile limit "buffer zone" as it may have the potential to be used with detrimental effect for developers. Forewind believe this should be challenged strongly to prevent it becoming a barrier to development of offshore wind farms within the UK and a clear statement that this does not apply to development in Scotland.

Forewind would like to see further evidence based justification as to why the buffer has been set to 12nm. The SEA clearly states that development both within and outwith the 12nm limit would be subject to further, site specific detailed information gathering, which would need to be assessed. This surely negates the requirement of having any buffer at all. Forewind would like to see a clear statement in the SEA that the coastal buffer has to be dealt with on a case-by-case basis.

Forewind would be further satisfied if the SEA put forward that development outside this area was less contentious given the fact that developers would, as a result, be avoiding the areas which result in the highest adverse impact. Forewind would suggest that this be developed further within National Policy Statements.

The 12nm coastal buffer gives the potential for visual impact assessment, for those sites closer than 12nm, to become both more onerous and more subjective. This 'buffer' area needs to be better specified and in such a way that it is appropriate and not unnecessarily restrictive.

Although the SEA report states that in an 'international' context, Belgium and the Netherlands have adopted wind farm zones beyond 12nm from the coast; there seems limited justification for application of the same buffer extent around the UK coastline. Human activities and features of conservation interest within the UK are generally concentrated along the coastline, significantly inshore of the proposed buffer zone, rather than out to 12nm.

Oil and Gas Platforms

Presumption that windfarms should be sited no closer than 6nm to oil and gas infrastructure.

Forewind considers the SEA approach to oil and gas infrastructure buffer zones is overly cautious and does not reflect existing and accepted practice. Forewind requests that this 'hard' constraint be reviewed and re-assessed.

Forewind understands that there is a fundamental safety need, as indicated by the CAA, to maintain a 'buffer' area around oil and gas infrastructure due to helicopter access requirements in reduced visibility situations (when automated Instrument Landing Systems cannot be utilised). Currently, the default 'buffer' zone is set to 6nm. Within section 5.7.2 of the SEA, the 6nm is assumed, and has been applied, as a hard constraint, regardless of any precedence which has been set during Round 1 and 2. For example, RWE npower renewables Limited (NRL) have consented the Gwynt y Môr, Round 2 windfarm, having agreed a 2.8nm buffer to BHP Billiton's Douglas Platform. This large, manned gas platform is accessed continuously by helicopter however the potential issue was resolved through detailed technical assessment and extensive consultation. In addition to this, NRL's Triton Knoll site, which is currently progressing through the consenting phase, is within 3 and 5nm of the Amethyst B1D and A1D platforms respectively. Lastly, Airtricity's consented site West Rijn, offshore of the Netherlands, is located within 0.3nm of the unmanned P15-F platform, within 3.6nm of the unmanned P15-G platform and within 4.4nm of the manned P15-C central production platform. This has resulted in an additional 45km² (or approximately 225MW) to the Development Areas than would be achievable using the SEA mapping constraints.

The net result of this 'hard' constraint is to also reduce the possibility for co-existence between the offshore windfarm industry and oil and gas facilities. If this is to be the case, it will put enormous significance on the wind farm overlap guidelines currently being drawn up by BERR/DECC/BWEA. Round 3 developers will not be able to accept a risk that future oil and gas licensing rounds could impose licences contiguous with planned or consented offshore wind projects.

Forewind, whilst recognising the importance of maintaining safe access (principally relating to helicopter movements) feels it would be appropriate to adopt a less conservative approach to oil and gas infrastructure within the SEA, acknowledging that development closer to oil and gas infrastructure can be (and has been) achieved through successful consultation between developers and platform owners

ii. Criteria where an alternative approach to determining hard constraints is recommended

Forewind considers the following constraints within the SEA should be revised as follows -

Bathymetry - Forewind consider 50-60m depth a soft constraint based on assumptions that there is likely to be an engineering solution in developing in these deeper waters.

MoD PEXA Areas - Consultation with the MoD may resolve conflicts with PEXA.

Other Issues

Regional Seas

Throughout the report, analysis of UK waters is broken down into Regional Sea areas. Therefore Section 6 (Recommendations and Monitoring) would be significantly improved if there was a section giving the key issues and recommendations by Regional Sea area.

Recommendation 1 – Page 213 – DECC to ensure offshore wind minimises potential sterilisation

The SEA has been instigated due to the Government's commitment to meeting its European and National renewable energy and energy consumption goals for 2020 and beyond, by enabling some 25GW of additional offshore energy generation capacity by 2020. Given this clear and strong backing from the UK government for the offshore wind industry to significantly expand and hence help to achieve the government's targets, the phrasing of recommendation 1 appears unduly negative and obstructive. DECC is explicitly recommending to ensure that offshore wind developments "**minimise potential sterilisation of areas for other industries**". However the whole report and spatial constraint mapping of section 5.7.2 has outlined how existing industries are effectively sterilising large areas of the most economically viable seabed from development by offshore wind. Surely this recommendation should also, or preferably only, stipulate that **DECC and other government departments should mandate other sea users to minimise potential sterilisation of areas for the offshore wind industry**, in order to facilitate the offshore wind industry achieving DECC's legal obligations.

Recommendation 2 – Page 213 – presumption against offshore wind development in particular areas.

If this recommendation is read literally it can be interpreted such that any windfarm which e.g. interferes with a radar system (item c in the recommendation) should be avoided. Forewind would like to raise its concerns over this blanket recommendation and the potential if Forewind applies for an Agreement for Lease, for an identified windfarm project, it could be rejected by the Commissioners (i.e. The Crown Estate) should it interfere with radar systems.

Forewind propose that a section of general text is added in the SEA at this point using words to the following effect; "In particular, if adequate solutions are not found after discussions between developers and stakeholders, there should be a presumption against...".

Recommendation 19 – Page 216 – Round 1 and 2 extensions should be seaward side and require site specific evaluation since significant new information is now available.

Forewind believes the basis for this recommendation is not discussed elsewhere within the SEA. Although it might follow on from discussions regarding distance of windfarms from shore but since this is subjective and open for discussion on a site-by-site basis, it is not necessary to address Round 1 and 2 issues in a separate recommendation (Recommendation 2 and 4 should suffice). Furthermore, several Round 2 sites are further from shore than the recommended 12nm, and therefore the reasoning behind a general rule of extensions on the seaward side does not necessarily apply.

Recommendation 22 – Page 216 – in certain key areas of marine mammal sensitivity, operational criteria should be established to limit cumulative pulse noise.

Forewind would like DECC to be more specific regarding this recommendation. If a "key area of marine mammal sensitivity" encompasses several zones, Forewind would have concerns over would there be a first-come-first-

served principle to ensure that noise limits are exceeded. For example, several zones coincide within a “key area”, and were all being developed concurrently by separate developers (who could potentially be working to similar construction timetables and thus have a high likelihood of piling during similar periods), this could lead to onerous conflicts. Forewind therefore would welcome further work on alternative mitigation solutions to alleviate the potential subsea noise impact to fish and marine mammals

Discussion surrounding the potential impact on marine mammals and fish from piling activities is currently limited to evidence from monopile foundation installation. However, Forewind believes it should be borne in mind that, as water depths for projects increase to greater than 30m and as turbine sizes increase to 5MW or greater, the technical limitations of monopile foundations will mean that this foundation type is no longer technically or commercially feasible. It is therefore probable that the majority of the planned 25GW of offshore wind will not be installed on monopile foundations. This has the following impact on noise issues:

- a. For jacket, tripod or tripile foundations, the structure will be piled to the ground with multiple smaller and shorter piles than would be used for a monopile foundation. Diameters of piles are likely to be significantly less than in the evidence stated and therefore the maximum source noise and piling duration would be less than considered in the report. Numbers of piles could be increased with a subsequent impact on mitigation methods.
- b. For Gravity Base Structures, piling operations would not be required at all, and hence it is unlikely that subsea noise impacts would be considered as a material consideration.

Marine Conservation Zones and SPAs

The potential for new Marine Conservation Zones and offshore SPA designations could have a significant impact on the proposed Round 3 zones, yet there is insufficient clarity in the SEA over whether key stakeholders such as the JNCC have been engaged and a “best-guess” indication of where these designations are likely to be included in the GIS mapping of hard and soft constraints. Forewind would recommend further information being provided in the SEA regarding this issue and indication as to whether key stakeholders have been consulted.

Wake Effects

In Section 2.7 of the report, there is a discussion of experience and understanding of the effects of the wakes from wind turbines. However the conclusion is that this may lead to greater separation. Forewind would recommend the SEA also notes that there is also the possibility that it may lead to reduced separation.

Evolution of Baseline Environmental Impacts

Within Section 4.4, there is an excellent discussion on the potential evolution of the baseline for environmental impacts. Forewind recommends this discussion be mentioned in the rest of the report. Further information should be gathered on the described potential effects on fish stocks, birds and marine mammals, and these should be adequately modelled in all impact assessments. Offshore wind farms will have a material role in reducing the described impacts, but also some of the consequences of climate change may, for example, significantly reduce commercial fishing activities, and hence reduce the impact of offshore wind farm developments on such activities.

Scour Effects

Section 5.4.2 contains a long discussion on the potential for scour effects around monopile turbine foundations. Predicted scour around turbine structures is reasonably well understood and evidence from the Forewind

partners from existing projects indicate that scour around foundation structures has not transpired to be a major issue. However Forewind believes it is likely that the majority of foundations for future offshore windfarm developments will be jacket, tripod, tripile or gravity base types. It would be more appropriate to look at the evidence for scour around similar oil and gas installations to assess the likely overall impact from the plan/programme. Scour around gravity base structures could be a key issue, and Forewind recommend that it should be addressed in the report.

Grid Reinforcement

Section 5.9.1 details the potential environmental impacts from the required grid reinforcement activities required to allow the construction of 25GW of offshore wind. Forewind believes this is valid, but should be compared with a baseline of the additional grid reinforcement activities required for the additional generating capacity from non-renewable sources which would be required if the plan of 25GW did not go ahead was applied. For instance, if no offshore wind was built, the UK would need major additional generation capacity regardless, to replace the nuclear and coal fired power stations coming offline in the next 10-15 years. The additional gas fired, coal fired and nuclear plant would also require a major grid reinforcement exercise, with associated environmental impacts.

Bird Data Collection

Section 6.1 states that “developers need to be aware that access to adequate data on waterbird distribution and abundance is a prerequisite”. Forewind agrees that adequate data is required, but it should not be excessive. The bird survey standards required for a Round 2 project area may not be the same as required for a large Round 3 zone. Forewind suggests a characterisation approach across the Zones with more detailed study within the wind farm areas located for offshore.

Main Messages from Forewind

The SEA addresses several issues which potentially could be viewed as hard constraints, e.g. distances from coastline, oil and gas platforms, navigation routes etc. There are circumstances where it is possible to construct wind farms within these constraints without severe negative consequences for other stakeholders. Consequently the SEA should be clearer that a site-by-site discussion between developers and affected stakeholders must take place to identify and assess the impacts from the actual windfarm development plan.

In regard to this, during the meeting between Forewind and DECC at their offices on 27th March 2009, DECC expressed that their intention is to open up site-by-site discussions and that the draft SEA should not be read as defining any exclusion zones. Forewind would recommend that this is more explicitly stated within the SEA report.

The 12nm coastal buffer needs to be based on more evidence to ensure it is applied for the correct reasons and is not unnecessarily restrictive to future offshore wind energy development and hinder the achievement of 2020 aspirations.

The navigation and shipping guidance should be supported by further data to ensure that the large generalisations made are appropriate.

The 6nm buffer zone surrounding oil and gas infrastructure should be assessed on a site by site basis and this should be outlined within the SEA.

Forewind would like to reiterate that it is appreciative of the opportunity to provide feedback to DECC on the Offshore Energy Strategic Environmental Assessment and looks forward to receiving the final document later in the spring/summer.

Forth Ports PLC

Marine Department

UK Government Offshore Energy Strategic Environmental Assessment Consultation

- The AIS data at the scale presented appears to be insensitive to actual usage and therefore believe more appropriate scale maps and longer time frames of AIS should be presented with particular focus on Round 3 sites. This is particularly important where maybe there is an in-combination effect with the Scottish Territorial Waters wind projects.
- When analysing marine traffic, the size and manoeuvrability of vessels should be considered.
- The analysis of AIS data only over a 4-week period at the beginning of each quarter lacks the sensitivity to identify the variable nature of ship routing driven by prevailing weather conditions that may significantly alter the approach taken by a vessel.
In adverse weather conditions, obstructions (e.g. wind farms) may require vessels to be involved in additional manoeuvring around these restricted zones, affecting the safe manoeuvring characteristics and safe passage.
- We note reference to 12 nautical miles and buffer; but also what has to be born in mind that substantial traffic crosses the North Sea from Scandinavia / Baltic and Benelux Regions and therefore due consideration must be applied to direct access to Ports from these regions as well as coastwise traffic.
- A3h.2.3 – Anchorage and Places of Refuge
 - We are unclear what is meant by ‘Anchorage and Places of Refuge.’
 - We are unclear what is meant by the term ‘Harbour of Refuge.’
 - It would appear that there is no mention under Table A3h.1 of areas available between Bridlington and Fraserburgh (for e.g Rivers Forth and Tay.)

Fred. Olsen Renewables Limited
2nd Floor, 64-65 Vincent SQ
London SW1P 2NU

Tel: 020 7931 0975

Fax: 020 7931 7449

VAT Reg No. 792 2100 49

Fred.Olsen Renewables Ltd Offshore Energy SEA Consultation Response

Fred. Olsen has been involved in the wind power sector since the mid 90's with a presence in Norway, Sweden, UK, Ireland and Canada. In addition, Fred Olsen Renewables Limited (FORL) currently has 178MW of operational wind projects, a further 273MW consented in the UK, and 1100MW consented just off the Irish coast; this makes FORL a major player in the wind energy sector, including offshore. FORL are members of BWEA, SRF, IWEA and NOW Ireland and FORL staff are active on a number of the industry working groups.

FORL's commitment to the offshore wind industry is demonstrated through its involvement in an expanding portfolio of projects and initiatives; FORL are joint owners of the consented Codling Wind Park offshore wind farm (1100MW), off Ireland and has recently been awarded an Exploration Agreement by The Crown Estate for a 415MW offshore project within Scottish Territorial Waters.

FORL is participating in The Crown Estate's Round 3 Tender process and welcomes the opportunity to comment on Government's UK Offshore Energy Strategic Environmental Assessment (SEA). Our response includes a number of general comments followed by specific responses to the recommendations made in the Environmental Report. As a renewable energy company we have not responded to those recommendations which relate specifically to the oil and gas licensing, as we do not have extensive knowledge of this sector.

FOR looks forward to working with Government to realise it's plan/programme for an additional 25GW of renewable energy from offshore wind.

General comments on the SEA Environmental Report Recommendations

FOR welcome the SEA report's strategic view and the overarching conclusion that *"...there are no overriding environmental considerations to prevent the achievement of the wind elements of the plan/programme"*. We acknowledge that the SEA is intended to identify potential mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea, but at the same time FOR believes that the UK Government's 2020 renewable energy targets are of such strategic national importance that a

presumption in favour of renewable energy development should be written into the National Policy Statement (NPS) for Renewable Energy, and reflected in other key NPS', especially the Marine Policy Statement.

We understand that Government will respond to the consultation in June 2009, stating its final conclusions; FOR hopes this report will give clarity to the responsibilities and timescales for taking forward the final recommendations, as these will require considerable resource.

FOR's interpretation of the SEA report in its current format is that there should be a presumption against renewable energy development wherever spatial conflict arises with other sea users, areas of high nature conservation and cultural heritage value. As part of a developing industry that is committed to delivering a substantial contribution of Government renewable energy targets we are concerned that the offshore wind industry appears to be treated as a lower priority than other marine industries, especially oil and gas, gas storage and potentially carbon capture. At the same time the report notes the future development of marine spatial planning but unless the importance of the offshore renewables industry is explicit in National Policy Statements we are concerned that this presumption against development will continue and be reflected in emerging marine spatial plans. Given the current technological and economic considerations of the offshore wind industry it is important that the preference for no development within Territorial Waters does not set a precedent for future leasing rounds. From a UK marine planning perspective FOR are concerned that this conclusion and recommendation contradicts the approach currently being considered in a separate SEA within Scottish Territorial Waters.

Realisation of the positive environmental benefits of offshore renewable energy development brought through climate change mitigation should receive a much higher prominence, along with the potential for innovative technological and mitigation solutions to enhance biodiversity and achieve sustainable development. Furthermore, the potential socio-economic contribution to the UK economy is not fully recognised.

Comments on the individual SEA Report Recommendations

1. In areas with high renewable energy generation potential DECC should ensure decisions on renewable energy leasing and licensing for oil & gas (including natural gas storage) are coordinated to minimise potential sterilisation of areas for other industries. This recommendation extends to maintaining options for potential future geological storage of captured carbon dioxide.

FORL fully support a co-ordinated approach to development but are concerned that this recommendation suggests that, even in those areas which offer the best development potential for renewable energy generation, that there is a presumption in favour of other activities so as to reduce sterilisation. In particular we note that this is extended to maintaining options for potential future carbon capture. We understand that future licensing/leasing of carbon capture and storage will require a separate SEA so we are concerned that future decisions may conflict with the offshore renewables programme. This introduces significant uncertainty for offshore wind developers and needs to be clarified and articulated through the forthcoming suite of National Policy Statements.

The resolution of spatial conflicts should be based on a clearly defined set of principles for marine spatial planning (MSP) which will enable Government to meet targets and optimise sustainable development in the marine environment. At present it appears that spatial conflicts between different energy sources will

favour hydrocarbons, gas storage and the potential for carbon capture and storage. Carbon capture and storage is likely to lead to substantial development of new seabed infrastructure in the future and it is not clear how this could impact upon the offshore wind programme and specific projects.

Further more, where there is future conflict for oil and gas exploitation, compensation is offered as mitigation for conflicts and this continues to be a cause for concern with offshore wind developers.

2. The draft plan/programme for an additional 25GW of offshore wind farm (OWF) generation capacity will require wind farm development on a massive scale. In advance of a formal marine spatial planning system being in place for the UK, the leasing and consenting of OWFs must ensure the minimisation of disruption, economic loss and safety risks to other users of the sea and the UK as a whole. In particular, there should be a presumption against OWF developments which:

- a. impinge on major commercial navigation routes, significantly increase collision risk or cause appreciably longer transit times*
- b. occupy recognised important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede previous activities)*
- c. interfere with civilian aviation including radar systems*
- d. could potentially jeopardise national security for example through interference with radar systems or significant reductions in training areas*
- e. result in significant detriment to tourism, recreation and quality of life*

FOR is concerned that the SEA excludes large areas of development potential on the basis that they will impinge on major commercial navigation routes. The main evidence presented appears to be based on data that we consider not to be sufficiently statistically robust for conclusions to be drawn on a national/strategic scale. FOR endorse the view that human safety must remain of paramount importance but we also feel that further work is necessary on the key issues before the presumption against development in these large exclusion zones becomes a precedent. There needs to be much greater transparency as to how the unpublished MCA data was used and analysed for the purposes of the SEA and its recommendations.

In relation to fishing interests we are concerned that this presumption is based on existing fisheries interests and that the evidence base is not extensive. Patterns of fisheries activity may change in the future due to the impact of climate change on fish ecology. We note the potential significance of transboundary issues and that off the east coast foreign/non-UK fleets dominate the fishing activity. We are concerned that data for these areas will be difficult for developers to acquire, and we would like to see increased effort from DECC to engage with the relevant fishing organisations from other member states than is apparent in the SEA. The potential for protracted consultation and negotiation with other member states could considerably delay the development of areas far offshore as well as increase costs to projects in these areas.

FOR would like to see some assurance that the relevant Government departments will work together to bring forward technical solutions relating to civil aviation and military radar, whilst maintaining the integrity of national security, and this should be reflected in the relevant National Policy Statements.

There are relatively few studies that have considered in detail the socio economic impacts of offshore wind farm development on local communities; we are concerned that the SEA presents a presumption against development in those areas which it considers tourism and recreation to be major activities, assuming

the impacts to be negative. The experience to date is that offshore windfarms have been welcomed as a positive contribution to local coastal communities. Developers put considerable effort into the assessment of potential visual impacts of offshore wind through the EIA process and although in general it is more acceptable that large scale developments are best sited further offshore, each project should be considered on its own design merits, and that in many cases development of a scale proportional to the seascape is not a visual intrusion. The reduction in carbon emissions afforded by the development of offshore renewables, and its contribution to the energy supply, should be promoted as a positive benefit on the quality of life.

3. Until there is a firmer base of information available to inform adaptive management, in respect of ecological receptors a precautionary approach to siting is recommended since the offshore wind industry is relatively young, with appreciable technological development expected in for example, turbine size, rotation speed, spacing and potentially rotational axis. This precautionary approach dictates that unless suitable evidence indicates otherwise, avoidance (for the present) of areas known to be of key importance to waterbird and marine mammal populations, including breeding colonies, foraging areas and other areas essential to the survival of populations.

We are concerned that the precautionary principle continues to be used as an easy alternative to difficult decision making and can cause un-necessary delay in the consenting process. The offshore wind industry may still be considered immature but it has already contributed significant amounts of environmental data to the UK marine community and statutory advisors, either through baseline studies and the EIA process, or through post construction monitoring. All this data is available to the consenting authorities and advisory bodies, and along with an increasing amount of data from other European projects which should be used to inform an adaptive management approach. We believe that there is now a substantial amount of data to enable a more pragmatic approach to be taken on decision making during the consenting process.

Regulators and advisors have developed a considerable amount of the experience and knowledge from both Rounds 1 and 2 to inform adaptive management decisions, and developers wish to work with them to provide more innovative solutions and mitigation measures to potential impacts. We agree that the technology will develop considerably over the next decades and that development further offshore will require a large data gathering and zone assessment programme by developers. We acknowledge that there is a general paucity of quality spatial and temporal data for areas furthest offshore and that the location of these preferred areas for development will require significant investigation through environmental surveys. Investigation of these large area will require new approaches to data collection and developers would welcome greater guidance from statutory consultees to deal with, for example, cumulative and in combination issues to enable the "contextualisation" of individual projects within a larger development area. The changes in the planning regime through the IPC promise a clearer and more streamlined route to consenting so it is increasingly important that the lessons learnt from previous rounds of development.

4. Reflecting the relative sensitivity of multiple receptors in coastal waters, this report recommends that the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km). The proposed coastal buffer zone is not intended as an exclusion zone, since there may be scope for further offshore wind development within this area, but as mitigation for the potential environmental effects of development which may result from this draft plan/programme. The environmental sensitivity of coastal areas is not uniform, and in certain cases new offshore wind farm projects may be

acceptable closer to the coast. Conversely, a coastal buffer in excess of 12nm may be justified for some areas/developments. Detailed site-specific information gathering and stakeholder consultation is required before the acceptability of specific major Round 3 or subsequent wind farm projects close to the coast can be assessed. Marine spatial planning proposals are under consideration in Parliament, which would give coastal regulators and communities further opportunities to have a say in the way the marine environment is managed, in addition to the existing routes for consultation as part of the development consent process.

FOR notes that this SEA recommendation does not place an exclusion on development near the coast and that development will have to justify site specific plans through the Environmental Impact Assessment (EIA) and consenting process. We acknowledge that the largest scale development is best sited away from coastal waters of greatest environmental sensitivity but Rounds 1 and 2 of the UK offshore wind programme have demonstrated that development of a scale proportionate to the nature of the environmental setting is achievable with minimal impact, intrusion and disturbance.

FOR are, however, concerned that even though the 12nm recommendation is not intended as a complete “*exclusion zone*” and that “the bulk of” offshore wind should be beyond the territorial limit, the terminology is open to interpretation and may be construed as a precedent and strong presumption against any development. Those opposed to renewable energy projects will undoubtedly use this 12nm recommendation as a reason to object to all projects within territorial waters. The 12nm buffer zone recommendation therefore creates increased difficulty for several of The Crown Estate’s Zones within its plan/programme of development for Round 3.

FOR therefore do not agree that there is a strong enough argument to justify a recommendation which suggests a ‘blanket’ presumption against development in UK territorial waters, given that there is considerable resource in these areas and that the physical characteristics of the area make offshore wind economically viable.

FOR note the reference to forthcoming plans for the development of marine spatial plans (MSP) through the Marine Bill but are concerned that at present this adds another layer of uncertainty to the development process going forward, as it is not clear as to how Government intends to develop its marine spatial planning framework. UK Government has indicated that it will designate Marine Conservation Zones to comply with its international obligations for a network of marine protected areas by 2012. FOR is unclear as to how these areas will be selected and what impact they will have on offshore windfarm projects within Round 3 timescales.

FOR have development interests in Scottish Territorial waters and even though the UK Offshore Energy SEA did not cover this area we are concerned that this recommendation will directly contradict Scotland’s plans for offshore wind and will cause considerable confusion amongst stakeholders, especially where proposed developments are close to the Scotland/England boundary. It does not provide for the “joined-up approach to marine planning” being promoted through the UK and Scotland Marine Bills.

5. To minimise habitat change and to ensure areas developed as a result of the current draft plan/programme are left fit for previous or other uses after decommissioning, the volumes of rock used in cable armouring, foundation scour protection and pipeline protection must be minimised and there should be active promotion of alternative protection methods through the consenting process.

FOR acknowledge that environmental considerations are an important part of the design phase of project development and that potential impacts need to be mitigated. However, we are concerned that alternative engineering solutions to minimise environmental impacts could also compromise human safety, security of assets and the economics of a project. The requirements for foundation scour protection and cable armouring will depend on site characteristics investigated as part of the environmental survey programme, so FOR would welcome additional guidance on alternative protection methods and wish to know whether DECC will be undertaking research into this issue to assist developers.

FOR acknowledge that decommissioning should leave seabed areas fit for other uses in the future and will continue to work with Government and The Crown Estate to ensure that decommissioning plans for offshore windfarms meet statutory requirements and prevent sterilisation of the seabed for future uses.

6. For areas (zones and blocks) which contain good examples of habitats/species on the Habitats Directive Annexes, developers should be made aware that a precautionary approach will be taken and some areas with relevant interests may either not be leased/licensed until adequate information is available, or be subject to strict controls on potential activities in the field. Similarly, developers should note that DECC will continue to conduct Appropriate Assessments/screenings to consider the potential of proposed leasing/licensing and subsequent activities to affect site integrity.

FOR remain concerned about the over reliance on the precautionary principle (see response to recommendation 3). FOR are also uncertain as to how and when Appropriate Assessments (AA) will be undertaken, and who will be responsible for completing them, as the SEA is based on a UK plan/programme yet developers are bidding for Zones which are part of The Crown Estate's plan/programme. We would appreciate clarity on this matter at the earliest opportunity.

7. The effects of noise on marine mammals particularly from piling and seismic survey remain an issue of debate. A range of mitigation measures are available and their adoption is normally required through consenting. However, there is a need for cross-industry coordination of what noisy activities are planned, where and when, to facilitate the assessment of cumulative effects and implementation of temporal/spatial mitigation actions. The approach would require a mechanism to facilitate the exchange of information, for example through a web-based forum hosted by DECC, JNCC or the future MMO.

FOR welcomes the SEA conclusion that "neither regional nor local prohibitions on activities associated with offshore wind development are justified by acoustic disturbance considerations and that project specific assessments will be required." However, FOR is concerned that the SEA recommends that within certain key areas of marine mammal sensitivity operational criteria are established to limit cumulative pulse noise "dose". It suggests that this can be achieved through the regulatory framework if initially developed voluntarily. In particular, FOR is not clear as to how noise effects from installation activity, seismic activity and other sectors' activity would be dealt with on a voluntary approach and how this would be translated into licence application and delivery; FOR are aware that there is still considerable debate amongst specialists as to the significance of underwater noise on marine mammals and consider a web based forum to be sensible in concept, but limited in reality.

FOR believe that any cross industry co-ordination should involve all industries that operate in the marine environment, including military activity and shipping, not just offshore renewables, oil and gas.

8. Although there has recently been significant survey effort in coastal waters, the lack of modern data on waterbirds in offshore areas is noted. Developers need to be aware that access to adequate data on waterbird distribution and abundance is a prerequisite to effective environmental management of activities for example in timing of operations and oil spill contingency planning.

FOR fully support the need to gather bird data as part of the environmental management process and acknowledge that The Crown Estate's Zonal approach will enable a wider assessment, allowing individual projects to be 'contextualised' for a better analysis of cumulative and in combination effects. We recognise that further survey work has been undertaken for the purposes of the SEA but that this has been very limited over the most distant offshore areas under consideration as development zones. FOR are concerned therefore that conventional survey techniques might not be wholly suitable for data collection over very large offshore areas and would welcome greater guidance from the statutory conservation advisors with regard to acceptability of more innovative survey techniques (such as high definition cameras currently being developed and tested). We would also like to see more resource going into the development and updating of the ESAS database. We also believe that even though the large proportion of sensitivities occur within coastal waters that development in carefully selected locations and of an appropriate size and scale can be accommodated without significant environmental impact in these areas. FOR are concerned that this recommendation is likely to contradict the situation in Scottish waters and therefore makes transboundary decision making, stakeholder engagement and marine planning more complex.

9. There remain a number of subject areas for which the information base is limited and will need to be enhanced to support future marine spatial planning as well as project specific consenting. These information gaps include aspects of the natural world and human uses, with regional context and long-term trend data notably lacking. These gaps include:

- *Seabed topography and texture. For some areas there is excellent data for example from multibeam mapping undertaken variously including by the MCA, BGS and the SEA programme, but the UK lacks a coordinated programme to marshal such data, to identify priority gaps and to find ways to fill them*
- *Recent information on the distribution of fish eggs and larvae, and variability in space and time*
- *Detail of bird migration patterns, and variability in space and time including flight heights in different weather conditions*
- *An understanding of the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs*
- *Ecology of most marine mammal species and in particular important areas for breeding, foraging and resting*
- *Finer scale distribution of fishing effort, gears and catches for smaller vessels (<15m)*
- *Precision on the offshore distribution of navigation (AIS data coverage typically only extends 80km from shore)*
- *Effects on fishing activity in and immediately adjacent to constructed wind farms*

FOR agree that there are significant data and knowledge gaps at both strategic and regional levels. However, there exists a wealth of data from numerous marine sectors and this needs to be made available for development purposes. It is not clear who has the responsibility to fill these gaps for the purposes of marine spatial planning. FOR would welcome clarity on the process and timescales and how this might impact on the proposed development timetables to enable industry to meet the 2020 targets.

10. In areas of cold water coral reefs and other vulnerable habitats and species, physically damaging activities such as rig anchoring and discharges of drilling wastes (from hydrocarbon or renewable energy related activities) should be subject to detailed assessment prior to activity consenting so that appropriate mitigation can be identified and agreed which may include no anchoring and zero discharge.

FOR have no comment to make on this recommendation.

11. For the area to the west of the Hebrides (covered in SEA 7) it is recommended that blocks west of 14 degrees west should continue to be withheld from oil and gas licensing for the present. This recommendation also applies to the deepest parts of the Southwest Approaches. This is in view of the paucity of information on many potentially vulnerable components of the marine environment, and other considerations. Once further information becomes available, the possible licensing/leasing in these areas can be revisited.

FOR have no comment to make on this recommendation

12. Potential applicants for licences in the 26th and subsequent oil and gas licensing rounds should be reminded that the expectation for facilities design will be for zero discharge of oil in produced water.

FOR have no comment to make on this recommendation

13. The Department has a central role in UK energy and climate change response policies; in recognition of the national and international focus on climate change and curbing fossil fuel emissions, DECC should seek and give consideration at both the oil and gas licensing and project consenting stages to CO2 emission reduction proposals e.g. capture and storage (rather than venting) of CO2 from gas treatment offshore.

We agree with the recommendation that all activities should seek to reduce carbon emissions in order to combat climate change and contribute to UK targets for carbon reduction. FOR note that carbon capture issues are not considered within this SEA and are likely to be subject to a separate SEA. FOR consider it important that national policies do not favour carbon capture over offshore renewable energy and that this is reflected in National Policy Statements and within marine spatial planning consultations.

14. Efforts are (or will be) underway to identify offshore Marine Conservation Zones / Marine Protected Areas e.g. under the Marine Strategy Framework Directive, OSPAR and the Marine and Coastal Access Bill. Where the objectives of the conservation sites and renewable energy development are coincident, preference should be given to locating wind farms in such areas to reduce the potential spatial conflict with other users.

FOR support the need for adequate protection and management of habitats and species of national importance but wish to see greater visibility as to the site selection process for MCZs, and greater guidance from the statutory conservation advisors with regard to the potential nature and level of development permissible within MCZs. FOR believe that MCZs must only be designated where there is a robust scientific evidence base and that socio-economics have been fully taken into consideration. In our opinion MCZs should not be based on landscape/seascape considerations as these are typically subjective opinions. FOR consider that offshore windfarm sites can help achieve management objectives within MCZs.

FOR agree that stakeholders should be involved in the consultation and designation process including adequate representation from all marine industries.

We have some concerns over the timetable for selection and designation as this is likely to coincide with the period when developers are undertaking extensive environmental surveys across the R3 Zones which could cause delays to development plans.

15. Similarly, as part of the Natura 2000 initiative, further offshore SACs and extensions to SPAs are being identified. Such sites are not intended to be strict no-go areas for other activities and a number have been mooted in areas with significant potential for offshore wind farm development. Wind farm developers should be aware that SAC/SPA designation may necessitate, subject to the conclusions of any appropriate assessment, suitable mitigation measures so as to avoid adverse effects on a designated site or species.

FOR fully acknowledge that the development process must comply with the requirements of the Habitats Directive but are of the view that offshore windfarm development, in certain areas designated as offshore SACs or extensions to SPAs can be accommodated without significant impact and that innovative, cost-effective mitigation measures could make a positive contribution to the fulfilment of conservation objectives. FOR are concerned however that there will be a significant reliance on developers to bring forward data that could then be used to identify and designate Natura areas which then exclude development.

16. Gas storage projects need an EIA under the requirements of the EIA Directive. However, it is unclear at present under which UK regulations EIA for such projects would be undertaken, and early resolution is desirable in light of the drivers for increased UK gas storage capacity.

FOR would welcome clarity as to the regulatory framework for gas storage and also an indication as to how future projects will influence marine spatial planning and potentially impact proposed offshore wind development areas.

17. The Offshore Vulnerability Index (OVI) to surface pollutants developed by the JNCC should be reviewed in the light of results from recent aerial and boat based bird survey data, and updated if necessary. Consideration should also be given to whether the development of UK-specific individual waterbird species sensitivity indices and mapping of a Wind Farm Sensitivity Index (WSI) in UK waters would be useful in support of site selection and consenting.

FOR recognises that WSI could be a useful tool to inform aspects of site selection and consenting, but is one of many tools that could be used. Population Viability Analysis models for specific species could prove of more value and should be further investigated and developed. Cowrie has already undertaken work in this area but further work should be undertaken and made available to developers. FOR would welcome indication as to who would be responsible for taking forward such work and to what timescale so as to assist the Round 3 development programme.

Given the large scale of development that needs to be realised to meet the 2020 targets FOR consider that that seasonal restrictions on windfarm operation will have significant impact upon the economic viability of projects and must therefore be considered to be unrealistic as a consent condition.

18. The existing initiatives to develop waterbird Population Viability Analysis for sensitive species should be progressed, including, if necessary, research to improve the accuracy of inputs to the models.

See response to agree Recommendation 17. FOR wish to see the development of a range of standardised tools to assist in the EIA and decision making process. Such methodologies need to be agreed between developers, conservation advisors and key NGOs at the scoping stage.

19. The potential for capacity extensions to existing Round 2 wind farm leases requires careful site specific evaluation since significant new information on sensitivities and uses of these areas is now available (see also recommendation 2 above). As a general rule it is recommended that any such site extensions are to the seaward rather than the landward side. Round 1 sites are closer to the coast and it is anticipated that the majority would not be extended; any application for this would also require detailed site specific evaluation.

FOR believe that site extensions should be based on detailed site by site analysis. Given that a growing amount of monitoring data is available from operational windfarms regulators should be able to make informed decisions on such applications. At present FOR is not aware of any scientific evidence to suggest that extensions to Round 1 projects should not be considered. This will also be dependent on discussions with The Crown Estate as landowner.

20. Siting and consenting processes for offshore wind farms must remain flexible to allow for technological innovation, including in mitigation measures.

FOR agree with this recommendation. The Zonal approach offered by The Crown Estate in Round 3 provides greater flexibility in identifying suitable projects at individual site level, but this must be matched by flexibility within the consenting route through the IPC so that multiple project submissions can be made. FOR would welcome greater clarity on the IPC process and requirements.

21. The information collected by offshore renewables and oil industry site surveys and studies is valuable in increasing the understanding of UK waters. The initiatives such as the UKDEAL, COWRIE and UK Benthos databases to ensure that such information is archived for potential future use should be continued and actively promoted during the consenting processes. Similarly, there should be encouragement for the analysis of this information to a credible standard and its wider dissemination.

The offshore renewables industry is a leader in this field as it has already been a significant provider of marine environmental data through Round 2 and this is being extended to Round 3 through The Crown Estate's lease requirements. At present the data is being made available through Cowrie. The Crown Estate has indicated that in the future information will be made available through it MaRS initiative and we support the co-ordination that is occurring between government departments and The Crown Estate to make data available to the wider marine community.

22. It is recommended that in certain key areas of marine mammal sensitivity, operational criteria are established to limit the cumulative pulse noise "dose" (resulting from seismic survey and offshore pile-driving) to which these areas are subjected. This could be implemented within the existing regulatory framework for activity consenting, but will require a mechanism to facilitate the exchange of information, for example through a web-based forum hosted by DECC, JNCC or the MMO when established, with suitable links to all parts of the UK.

Please see response to Recommendation 7. The full economic impact of temporal and spatial restrictions on construction and operation must be taken into account as this could substantially impact upon project viability.

23. To assist developers and the achievement of conservation objectives, DECC and others in Government should encourage the adoption of consistent guidance across the UK on the implementation Habitats Directive requirements, for example disturbance of European Protected Species (Annex IV species).

FOR support this recommendation and suggest that this inter-agency work is identified as a priority following this SEA consultation.

Submitted by Carolyn Heeps
for and on behalf of Fred. Olsen Renewables Limited

Global Marine Systems Submission to the Offshore Strategic Environment Assessment Report Consultation

Contact details

Submitted by: Gabriel Ruhan, CEO

Telephone: 01245 702093

Address: Global Marine Systems Limited
New Saxon House
1 Winsford Way
Boreham Interchange
Chelmsford
Essex

CM2 5PD

Email: gabriel.ruhan@globalmarinesystems.com

Contents

1.0 Executive Summary	Page 1
2.0 About GMS	Page 2
3.0 Offshore Wind Farms	Page 2
4.0 Conclusion	Page 3

1.0 Executive summary

1.1 Global Marine Systems (GMS), a market leader in the laying of subsea cable and related engineering services for over 150 years, is delighted to respond to the Department of Energy and Climate Change (DECC) Strategic Environment Assessment (SEA).

1.2 Our area of expertise within an offshore windfarm project is in the installation, burial and eventual maintenance of both the inter-field cables (the power cables which connect the grid of turbines to each other) as well as the export cables, which connect the entire array of turbines back to land and the power grid itself.

1.3 We firmly believe that the development of offshore wind power is core to the UK's future wellbeing and economic and environmental security.

1.4 The coastal geography of the UK and the ambitious targets set out by the Government present a real opportunity for the UK to take a lead in the development of offshore wind. In addition, as the Strategic Environmental Assessment demonstrates, there is scope for enough offshore wind farms to power the equivalent of almost all the homes in the UK, and make a significant contribution to renewable energy targets.

2. About GMS

2.1 Global Marine Systems, a British company, has been involved in laying subsea cable and related engineering services for over 150 years. Global Marine Systems is the privately owned merger of what once were the marine divisions of British telecommunications companies British Telecom and Cable & Wireless.

2.2 Global Marine Systems has two core business units, Telecommunications and Energy. The Energy unit has a focus on the installation and maintenance of subsea power cables and related engineering services. As part of this unit we have, over the past eight years performed a significant amount of work in the offshore windfarm market. Global Marine has been a key service provider on such projects in the UK as the Kentish Flats and Barrow offshore wind farms. We have also successfully completed projects throughout Europe such as Horns Rev, and we are currently completing the world's largest offshore wind farm, Horns Rev 2.

2.3 Specifically, our area of expertise within an offshore windfarm project is in the installation, burial and eventual maintenance of both the inter-field cables (the power cables which connect the grid of turbines to each other) as well as the export cables, which connect the entire array of turbines back to land and the power grid itself.

2.4 As a result of our unique record in delivering these projects, we believe that we are a leader amongst a very small group of companies in the industry who have meaningful experience successfully executing work such as this. We are one of a small group of British companies with demonstrated expertise in this specific area and a viable business currently operating in this strategically critical market.

3.0 Offshore Wind Farms

Scope for Offshore Wind Farms

- There is a wider scope for between 5,000 and 7,000 more offshore wind turbines around the UK's coastline.

Environmental Impacts of Offshore Wind Farm Connectivity

- Scour effects (localised erosion and lowering of the seabed around a fixed structure) are small in scale and local in extent.
- The potential for significant effects, in terms of regional distribution of features and habitats, or population viability and conservation status of benthic species, is considered to be remote.

3.1 We welcome the Department of Energy and Climate Change (DECC) Strategic Environment Assessment of the UK's shores, which recommend that there is scope for between 5,000 and 7,000 more offshore wind turbines around the UK coast. DECC estimates that this would be enough to power the equivalent of almost all the homes in the UK and would make a significant contribution to renewable energy targets.

3.2 In addition we welcome the Government's commitment to 20% of electricity supply to come from renewable sources by 2020, and an 80% reduction in carbon emissions by 2050. Investment in non-polluting electricity generating sources is not only critical to meeting the UK's carbon reduction targets but also has the potential to form the basis of a major future growth area for UK plc.

3.3 In order to reach the Government's targets, we firmly believe that the development of offshore wind power is core to the future wellbeing of both the environment and the UK's economy.

3.4 As recently set out in the Government Low Carbon Industrial Strategy, the transformation to a low carbon society presents a valuable opportunity not only to convert industry to a low carbon philosophy, but also to develop the skills sector that will support it. The creation of highly skilled, highly sought jobs is critical to the UK's low carbon industry. We have developed world-leading training facilities for our industry within the UK and believe that educational, government, and business interests should be aligned in a common and realistic effort to meet future skills needs in the low carbon economy of the future.

3.5 As a market leader in the installation and maintenance of subsea power cables and related engineering services, GMS has a wealth of experience in minimising the environmental impacts of offshore wind farm connectivity. We are deeply aware and sensitive to the potential damage that can be inflicted by poorly planned and constructed subsea cabling.

3.6 One flagship project helping to address these issues is the Beatrice Wind Farm Demonstrator Project (Beatrice) - a €41 million project involving the installation of two demonstrator wind turbines adjacent to the Beatrice oil field, 25 km off the east coast of Scotland.

- Using our vessel Sovereign, Global Marine installed the two main cables, each comprising a power and fibre optic cable which connect the five megawatt turbines to Talisman's Beatrice oil platform
- The company needed to pay particular attention to the surrounding environment to ensure that the cable laying installation and noise did not upset the sea life and bird life in this coastal region, in line with the procedures outlined in Talisman's Environmental Impact Study.

This cable installation will enable Talisman to provide part of the power for the Beatrice oil field, using energy generated from the turbines. It will also remotely control and monitor the turbines' performance from Beatrice.

3.7. Despite the growing market for offshore wind, we are seeing some major entrants to the installation market make the decision to drop out. Due to the extremely complex nature of these projects as well as the need for a demonstrated track record of expertise in the laying of subsea cables in difficult environments with sensitivity and awareness of environmental issues We believe this speaks directly to the highly skilled, highly engineered nature of this type of work, more of which should be being created here in the UK.

4.0 Conclusion

4.1 We firmly believe that the development of offshore wind power is core to the UK's future wellbeing and economic and environmental security.

4.2 We look forward to continuing our work in the renewable sector across the UK and helping the Government reach its renewable deployment and carbon emissions reductions targets.

4.3 We hope that this outline of our experience in the adoption of offshore wind farms is helpful to your Strategic Environmental Assessment. We would be very happy to meet with you to share our experiences of supporting and engaging in the UK's energy market.

Offshore Energy SEA Consultation
Kevin O'Carroll
Head of Policy Unit
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Direct Line: 0131 668 8924
Direct Fax: 0131 668 8899
Switchboard: 0131 668 8600

HSSEA.gateway@scotland.gsi.gov.uk

Our ref: AMN/23/26 part 2 AM
Your ref:

22 April 2009

Dear Mr O'Carroll

**Environmental Assessment of Plans and Programmes Regulations 2004
DECC – UK Offshore Energy: Environmental Report**

Thank you for consulting Historic Scotland on the Environmental Report for DECC's UK Offshore Energy plan which was received in the Scottish Government's SEA Gateway on 30 January 2009.

I have reviewed the Environmental Report on behalf of Historic Scotland and should make clear that this response is in the context of the SEA Regulations and our role as a Consultation Authority. It therefore focuses on the environmental assessment, rather than the contents of the plan.

General Comments

I welcome that the comments we provided on the Scoping Report on 29 January 2008 have been taken into account during the preparation of the Environmental Report. The Environmental Report is well presented and it is clear that a great amount of effort has gone into the assessment. I am content with the assessment for our historic environment interests and have set out some detailed comments on some sections of the Environmental Report in an annex to this letter.

None of the comments in this letter should be taken as constituting legal interpretation of the requirements of the above Regulations. They are intended rather as helpful advice, as part of Historic Scotland's commitment to capacity building in SEA.

Please do not hesitate to contact me on 0131 668 8924 should you wish to discuss this response.

Yours sincerely

Alasdair M^cKenzie
Strategic Environmental Assessment Team Leader

Annex: Detailed comments on the Environmental Report

For ease of reference, the comments in this annex follow the same order as the Environmental Report.

1. The non-technical summary provides a clear overview and summary of the environmental assessment and I welcome the summary of the key findings for the effects of the plan on the historic environment.

Introduction

2. The introductory sections provide a clear overview of the background to the plan and its contents. I note that the focus of the assessment has been on future oil and gas exploration and offshore windfarm developments. As you will be aware, the Scottish Government will be carrying out its own SEA for offshore windfarm developments within their territorial waters.

Overview of the Draft Plan/Programme & Relationship to other Initiatives

3. I welcome the inclusion of Scottish Historic Environmental Policy (SHEP). It would have been useful to highlight how this initiative has played a role in shaping the assessment findings and plan recommendations. Simply for information, Scottish Ministers have recently consulted on policy on the Marine Historic Environment and it is intended that Ministers' finalised policies on these matters will be included in later versions. The Marine elements of SHEP were published for consultation between March and May 2008. A copy of the analysis report can be found here: <http://www.historic-scotland.gov.uk/index/about/consultations/closedconsultations.htm>

Scoping

4. I welcome the revision to the SEA Objective indicator as suggested at scoping. I agree with the identification of the potential for direct (physical) effects upon submerged archaeological remains in section 3.6 (e.g. through anchoring). You may wish to also include the potential for (indirect) effects upon the setting of historic environment features (in addition to visual intrusion). This will be of particular relevance for those historic environment assets situated on the coastline.

Relevant existing environmental problems & likely evolution of the baseline

5. I agree with the environmental problems identified for the historic environment and implications arising from the plan (potential effects from drilling, piling, cabling etc) and the likely evolution of the baseline.

Assessment

6. Simply for information, box 5.1, under potential effects to known or postulated archaeological heritage should refer to cultural heritage as opposed to bitopes. While the historic environment has been considered during the assessment process it would of been helpful to summarise the findings for this topic within the Environmental Report, disentangling the issues associated with landscape/seascape effects – focusing on those effects for the historic environment receptors. I welcome the commitment to the development of mitigation measures in line with existing guidelines for seabed developers.

7. I note the recommendations presented in section 6 and would query why historic environment factors are not represented here, particularly within recommendation 2. This would seem a good opportunity to highlight the need to consider environmentally sensitive and appropriate locations for development.



Offshore Energy SEA Consultation,
The Department of Energy and Climate Change,
4th Floor Atholl House,
86-88 Guild Street,
Aberdeen,
AB11 6AR

Wednesday 22 April 2009

Dear Sir / Madam,

**COMMERCIAL IN CONFIDENCE: Department of Energy and Climate Change
Offshore Energy SEA Consultation.
Inch Cape Offshore Wind Farm Response**

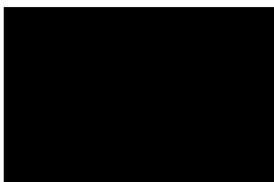
Inch Cape Offshore Wind Farm Limited (ICOWFL) is pleased to submit comments to The Department of Energy and Climate Change (DECC) in response to the recently published draft Offshore Energy Strategic Environmental Assessment (SEA) for consideration during this consultation period.

ICOWFL is a company set up to develop the Inch Cape OWF awarded exclusivity through the Crown Estates Scottish Territorial Water licensing round and comprises a joint collaborative effort between RWE Npower Renewables Limited (NRL) and SeaEnergy Renewables Limited (SERL).

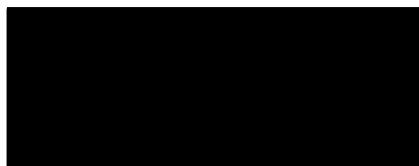
ICOWFL thanks DECC for the opportunity to provide comments and looks forward to receiving the final SEA this summer.

Yours faithfully

Inch Cape Offshore Wind Farm Limited



Jamie May For NRL



Daniel Finch For SERL

Inch Cape Offshore Wind Farm
Limited

Trigonos
Windmill Hill Business Park
Whitehill Way
Swindon
Wiltshire
SN5 6PB

T +44 (0)8456 720 090
F +44 (0)8456 720 050
I www.npower-renewables.com

Registered office:
RWE Npower Renewables Limited
Trigonos
Windmill Hill Business Park
Whitehill Way
Swindon
Wiltshire SN5 6PB

Registered in England
and Wales no. 06574673

OFFSHORE ENERGY SEA CONSULTATION

1. Introduction

- 1.1 This response is submitted by Inch Cape Offshore Wind Farm Limited (ICOWFL), a project awarded Exclusivity by The Crown Estate under the Scottish Territorial Waters Licensing Round, being jointly developed between RWE Npower Renewables Limited (NRL) and SeaEnergy Renewables Limited (SERL).

2 Consideration of the SEA Applied Coastal Buffer

- 2.1 The SEA consistently identifies the coastal buffer as an area which should not be seen as an exclusion zone. However, the SEA does in fact treat it as such in identifying the areas of potential development where the coastal buffer zone has been used to remove English and Welsh territorial waters entirely and hard constraints to further diminish the resource within the UK REZ. Of primary concern is the effect by association that Scottish Territorial Waters (STW) sites may have the same spurious constraints placed upon them.
- 2.2 The following sections provide a view on the sensitive receptors and constraints lying within the 12nm 'buffer' zone as identified in the SEA in order to provide a clear view on the applicability of this generic and intuitively applied mitigation measure to illustrate the limitations this imposes on offshore wind development under the Scottish Territorial Water Licensing round.

2.3

3 Coastal navigation routes, port access and safety

- 3.1 The SEA Environmental Report identifies AIS data to inform the spatial mapping of areas of importance for coastal navigation, port access and navigational safety.
- 3.2 However, in the SEA these are augmented with MCA 'siting not recommended' areas derived from unpublished (and officially unavailable) OREI 1 primary navigation routes.
- 3.3 The effect of this is to sterilise wide expanses of the sea area around the UK, substantially over and above those areas which can be demonstrated to be heavily used by shipping as derived from the vessel tracking data (AIS).
- 3.4 The assessment process based shipping constraints should be based upon analysis of vessel densities, thus providing potential for identifying sites for offshore wind farm development within potentially less critical areas for shipping.
- 3.5 The Crown Estate MaRS based approach appears to support this familiar assessment process in that Scottish sites accommodate known shipping routes on the understanding that there is potential for flexibility around the less dense vessel route areas.
- 3.6 Whilst shipping density is cited within the SEA as playing a role in the determination of constraint areas, the default position seems to have taken the worst case MCA's 'clearways' approach.
- 3.7 If taken at face value, the approach taken by the SEA could seriously jeopardise development of sites in the Firth of Forth area.

- 3.8 The need to apply a buffer zone of 12nm to protect navigational routes, lanes, port access or even navigational safety seems out of line with the measures already in place in the assessment of project location and historical practice and due processes already undertaken in consenting Round 1 and Round 2 offshore wind farms.
- 3.9 Close liaison with the MCA, Trinity House and the Chamber of Shipping through the established Nautical and Offshore Renewables Energy Liaison (NOREL) Group, provides a forum for marine industries and Government to discuss matters of mutual interest related to navigational safety.
- 3.10 This, coupled with formal Navigation Risk Assessments (NRA's) that assess the implications for actual vessel usage of sea areas obtained through AIS data and site-specific surveys (including smaller vessels), provides the appropriate level of rigour in considering the likely effects of siting a wind farm in a given sea area.

4 Inshore fisheries

- 4.1 Using the 12nm buffer to `protect` inshore fisheries may be valid in some areas, where an established inshore fleet exists, but in other zones and Scottish Territorial sites this is not necessarily the case. The buffer therefore seems over-precautionary.
- 4.2 Overall, it is suggested that the potential importance of areas for both fishing and offshore wind would suitably be negotiated during the feasibility and pre-development phase, rather than being provided for by applying a blanket (effectively exclusion zone) measure.

5 Aviation/ civilian and military radar interference

- 5.1 The application of the 12nm buffer zone to provide for mitigating sectoral conflicts in this instance is again questionable.
- 5.2 Firstly, the buffer zone would negate the potential development of areas within several Round 3 zones and STW sites, which are clearly outwith any consultation or radar interference area from known installations; and secondly, there is a range of activity ongoing which is attempting to mitigate wind turbine effects on radar coverage which may provide for development in areas currently subject to potential conflict between the two sectors.¹

6 Recreational yachting, sea use and coastal tourism

- 6.1 A buffer zone, if any is to be applied, extending to some 8-13km as has been employed previously would seem to provide for appropriate levels of protection for high-usage areas and it seems likely that extending this area to 12nm from shore will do little to increase this level of safeguarding.
- 6.2 The exclusion of offshore wind farm development within the 12nm area would indeed provide for safeguarding of recreational activities around the UK coastline, but the area protected is significantly greater than that subject to high recreational use.

¹ For example NATS (2008). Mitigating the effects of wind turbines on NATS En-Route Ltd (NERL) operations. Unpublished report, 13pp.

7 Landscape/Seascape

- 7.1 On the basis of the Landscape Institute and IEMA Guidance (2002), the appropriate distance for wind farm development from the coast will vary dependant on site specific conditions. In addition to the nature of the site, the potential environmental effects will be dependant on the nature of the proposed development.
- 7.2 Despite this acknowledgement that the nature of the scheme, including turbine number, arrangement and size will affect the likely effects of the scheme, the report proposes a universal 12nm buffer applicable to all of the Round 3 zones (and indirectly STW sites).
- 7.3 Clearly the coastal area of the Firth and Tay regions varies in character and quality, distance from proposed developments, and density of potential receptors and so it is difficult to see how a rigid buffer zone could ever be appropriate. There seems to have been no assessment of the effects of turbines between 13km and 22km from the shore, therefore there are concerns that the recommendations in the report are not founded on evidence based assessment.

8 Seabirds and waterbirds

- 8.1 The assessment of impact on bird interests arising from offshore wind farm developments is routinely undertaken to ensure that sufficient protection of feeding, roosting, foraging, breeding areas and migration routes are provided for in the final selection of a development site.
- 8.2 The current Round 3 process (and the implied association of the STW process in the Firth of Forth in relation to Zone 2) provides for a more holistic strategy in assessing potential effect on birds through the zonal approach to development, allowing more regional assessment of environmental sensitivities in the selection of specific sites.
- 8.3 Applying an expansive buffer zone does not automatically provide for protection at the site-specific scale and leads to unnecessary sterilization of potential projects and resource areas.
- 8.4 On the basis of the accepted requirement to collect a comprehensive baseline dataset to inform assessment, it is therefore considered appropriate to deal with individual zones and the location of wind farm sites within the zone on a case by case basis.
- 8.5 Applying a catch-all mitigation measure which serves to potentially reduce the potential of Scottish Territorial waters sites, seems counter-intuitive when the appropriate assessment will be conducted on the specific conditions and qualities of the zone itself.

9 Overall comments

- 9.1 Overall, ICOWFL does not consider it appropriate for the Environmental Report to set a broad buffer zone around the UK in relation to future wind farm development, particularly, the implied conflict it creates with the development of Scottish Territorial Sites.
- 9.2 Although specifically stated as not representing an exclusion zone, the adoption of a set distance from the shore within this document is likely to encourage the use of this figure in future during the development of National

Policy Statements, in stakeholder consultation and the determination of consents for offshore wind farm projects.

- 9.3 The proposed buffer zone does not take into account the fact that development in closer proximity to the coast may be acceptable, particularly taking into account mitigation strategies such as careful consideration of the number, arrangement and height of turbines.
- 9.4 Rather than balancing the relative benefits and costs of developing offshore wind resources against the existing marine interests, the Environmental Report adopts a precautionary approach whereby existing activities and interests automatically take precedence over the development of offshore wind projects often based upon intuition as opposed to evidenced based rationale.
- 9.5 It is therefore considered that the UK Offshore Energy SEA Environmental Report undermines and substantively weakens the position of ICOWFL and that of other Scottish developers to successfully progress its development in STW.



Joint Nature Conservation Committee
Dunnet House, 7 Thistle Place
Aberdeen, AB10 1UZ, United Kingdom

Telephone 01224 655716
Email: finlay.bennet@jncc.gov.uk
www.jncc.gov.uk

Department of Energy and Climate Change
Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

Email: sea.2009@berr.gsi.gov.uk
FAO: Kevin O'Carroll – Head of Environmental Policy Unit

22 April 2009

Dear Kevin,

**The Environmental Assessment of Plans and Programmes Regulations 2004
Regulation 13 Consultation Procedures
DECC Offshore Energy Strategic Environmental Assessment Programme
Consultation on the Environmental Report for Offshore Energy SEA**

Thank you for your consultation of 26th January regarding the Offshore Energy SEA.

This letter is a joint response from JNCC, CCW, NE and SNH, outlining a summary of the key points of interest which are common to JNCC and the country agencies. JNCC's more detailed comments are provided in the annexes attached to this letter, and the country agencies are providing their detailed comments individually.

The Joint Nature Conservation Committee (JNCC) is the statutory advisor to Government on UK and international nature conservation, on behalf of the Council for Nature Conservation and the Countryside, the Countryside Council for Wales, Natural England and Scottish Natural Heritage.

The Countryside Council for Wales (CCW) champions the environment and landscapes of Wales and its coastal waters as sources of natural and cultural riches, as a foundation for economic and social activity, and as a place for leisure and learning opportunities. CCW aims to make the environment a valued part of everyone's life in Wales.

Natural England (NE) conserves and enhances England's natural environment, for its intrinsic value, the wellbeing and enjoyment of people and the economic prosperity that it brings.

Scottish Natural Heritage (SNH) is a statutory advisor to Scottish Government. SNH's role is to look after Scotland's natural heritage, help people to enjoy and value it, and to encourage people to use it sustainably.

Summary of key points

Overall we welcome the important overview of relevant environmental data that the SEA represents. Where we have concerns regarding either the content or interpretation of the environmental data, these are provided in detail in our individual agency comments. Our main comments seek to ensure that we maximise the opportunity presented by the SEA

process to anticipate and address key environmental risks with a view to enabling the draft plan/programme to be achieved as efficiently as possible. We have identified 5 key points:

1. Overall Conclusion - We support the main conclusion of the SEA that alternative 3 to the draft plan/programme is the preferred option, with the area offered restricted spatially through the exclusion of certain areas. We also agree, subject to important caveats, that the environmental data presented in the SEA provides no conclusive evidence that overriding environmental considerations will prevent the achievement of the plan/programme. However we do have concerns with respect to the evidence base and with some of the interpretation. In our view there are significant environmental risks that need to be effectively managed to ensure the plan/programme can be delivered. We are not convinced that the recommendations as currently presented are sufficiently robust to ensure that environmental risks will be adequately addressed. We provide more detailed comments in our individual agency responses that are intended to ensure that these risks are addressed in a reasonable and proportionate manner.
2. Mammals - We welcome the suggestion of how to address potential cumulative effects to marine mammal populations resulting from the combination of oil & gas licensing and the construction of offshore windfarms. However, we think the SEA fell short of adequately assessing whether the plan/programme could have significant impacts on the populations of cetaceans of concern as a result of those potential cumulative effects. Such an assessment would better inform the need and characteristics of possible measures. In addition, recent amendments to the Offshore Marine Regulations (2007) and to JNCC's guidance mean we are no longer confident the main conclusion that "it seems improbable that significant effects as regulated by the Regulations will occur" is valid. We are also concerned that the SEA has not identified all the key areas of marine mammal sensitivity. Detailed comments on these issues are provided within agency specific responses.
3. Birds - In our view there is significant uncertainty with respect to the likely impacts of implementing the plan/programme on birds. For example, locations of marine SPAs have yet to be finalised. We believe the evidence base for likely cumulative impacts at the strategic/population level needs to be improved and that the recommendations could more clearly reflect this need.
4. Recommendations - The recommendations contained in Section 6 of the Environmental Report are key to ensuring the plan/programme is effectively achieved. We provide, in our respective agency responses, comments where we believe there are gaps in the recommendations or where existing wording could be improved. As a general principle we believe that recommendations that seek to address uncertainty by improving the evidence base should take precedence over those that apply the precautionary principle, unless there are overriding reasons, for example concerning cost/benefit. We are also surprised the recommendations are not presented in any logical manner. A more logical sequence would help the recommendations to be better understood and implemented.
5. Implementation - A critical issue for the draft plan/programme is that the recommendations are implemented effectively. We believe some of the recommendations will need to be managed through an implementation plan. We recognise the challenges this presents and are keen to continue to work collaboratively with DECC, Crown Estate and industries to facilitate a successful outcome.

Finally, we offer a number of observations on the current SEA process, which we recommend are considered during implementation and for subsequent strategic assessment of marine energy development.

6. Assessment of Alternatives - The plan considered in this SEA includes only selected elements of the energy generation infrastructure that might contribute to the achievement of UK carbon reduction targets; potentially significant elements sit outside the plan and therefore the SEA (e.g. the Severn Tidal Power Project and other wave & tidal stream development). As stated in our comments on the scoping of the SEA in February 2008, we are concerned that by considering only selected elements of offshore energy generation, DECC have limited the assessment of alternatives and therefore risk failing to bring forward the technologies or mix of technologies that are least damaging to the environment.
7. Spatial Planning and the SEA – Spatial planning is becoming an increasingly important tool for understanding and delivering marine management. We believe that to implement the recommendations effectively spatial planning will be essential. We are aware of the approach taken by The Crown Estate to identify areas that may be suitable for development as part of Round 3. Developing this approach further, in collaboration with the agencies to address environmental risks will be welcomed.
8. The SEA Recommendations and Resourcing – Implementation of the SEA's recommendations will provide more precise outputs on the identification and agreement of areas suitable for development (as outlined above). As part of this process engaging statutory advisors at a strategic level should streamline the level of commitment required at the project level. This would help address the potential for bottlenecks in the energy consenting process.

JNCC and the country agencies are committed to enabling the successful implementation of the draft plan/programme. We welcome the considerable amount of work that has been undertaken to date under the SEA process to enable understanding of the environmental impacts. We look forward to continuing to work with DECC and other stakeholders to help address our comments as part of the Offshore Energy SEA process, and to subsequently facilitate the implementation of the recommendations.

More detailed comments from the JNCC on the SEA are provided in the attached annexes and by the country agencies in their responses. Should you have any specific queries with regard to this response please get in touch with Lucy Greenhill or myself in the first instance.

Yours sincerely,

Finlay Bennet

Attached: Annex A – Specific comments on Marine Mammals, Birds and Benthos *p.4*
Annex B – Additional General Comments *p.11*
Annex C – Specific Comments on the Recommendations and Monitoring *p.14*
Annex D – Comments on Appendices *p.18*

Annexes - JNCC Specific Comments

Annex A - Specific comments on Marine Mammals, Birds and Benthos

This annex contains JNCC's detailed comments relating to the marine mammals, birds and benthos sections of the Environmental Report.

A1. Marine Mammals

A1.1 Assessment of the risk of significant impacts at the population-level

The impact assessment carried out in the SEA concluded that the potential acoustic effects most likely to be significant are those of pulse sources associated with seismic survey and pile-driving, a conclusion that JNCC agrees with. However, whilst the assessment followed a rationale that we found adequate (page 90), we found it fell short of adequately assessing whether the planned years of seismic survey exploration together with the construction of offshore windfarms could have significant impacts on the populations of cetaceans of concern. We think that this is mainly because:

- a) the existing evidence on the effects of the construction of offshore windfarms on harbour porpoises was not incorporated in the assessment,
- b) the PCAD¹ framework, which is currently recognised as the best way to assess the potential impacts to marine mammals from noise at the population level, was not even mentioned in the SEA report, and;
- c) the possible scenarios of windfarm construction were not explored in the context of the effects on marine mammals.

These are discussed in more detail below:

a) The potential effects of construction on harbour porpoises

The SEA estimation of spatial ranges affected by pile-driving and seismic focussed on using quantitative thresholds for injury (SPL in Southall *et al.* 2007) and the (US) National Marine Fisheries Service thresholds for "harassment". JNCC would have liked to have also seen a consideration of Sound Exposure Levels in the assessment of risk of injury. In addition, the assessment of disturbance is based on TTS onset for single pulses. While this general approach is welcomed and partially informs mitigation measures to avoid injury we are not so confident that the approach was wholly adequate to assess the spatial ranges to which disturbance may extend. JNCC does not consider that the TTS-onset ('measurable transient effect on hearing') for single pulses can be used as a disturbance criterion for multi-pulsed sounds such as those produced by pile driving and seismic. Multi-pulsed sounds will have more than a transient effect on the animals (see Southall *et al.*, 2007 and JNCC Guidance 2009) and therefore using this threshold would not be precautionary. The sound level threshold for behavioural disturbance as a result of multi-pulsed sounds will lie below the single pulse threshold for TTS-onset. Therefore the estimated ranges for behavioural responses (Table 5.1) should be re-calculated based on lower levels for each of the species of concern. It is expected that these ranges will be greater than those estimated here. Harbour porpoises in particular seem sensitive to a wide range of sounds at very low exposure Received Levels (~90 to 120 dB re: 1 µPa). All recorded exposures exceeding 140

¹ PCAD – Population Consequences of Acoustic Disturbance (NRC 2005. Marine Mammal Populations and Ocean Noise: Determining when noise causes biologically significant effects. National Academies Press, Washington, D.C.)

dB re: 1 µPa induced profound and sustained avoidance behaviour in wild animals of this species. This behavioural response, if recurrent in subsequent days/weeks would be likely to constitute a significant effect on local abundance and distribution under the disturbance regulations.

We think that the SEA should consider the evidence from the Danish studies (Tougaard *et al.*, 2006a and Tougaard *et al.*, 2006b²) in the assessment of the risk of disturbance. The monitoring studies associated with the construction of these windfarms showed a significant avoidance reaction to the pile driving noise for an area of at least 15km around the noise source. Even if this effect was short-lived and the animals returned to the area once piling had ceased (around 7 hours from the onset of piling which lasted for 70 minutes for each monopile); over the whole 5 month construction period it resulted in a displacement of animals from an area larger than 600 km², for roughly 17% of the time. This effect would constitute non-trivial disturbance under the UK regulations (hence an offence), even though it would be unlikely to result in significant impacts at the population level. However, Tougaard *et al.*, 2006a highlights that it could become problematic if two or more windfarms are constructed close to each other at the same time. The authors warn of potential effects of several plans for windfarms being realised within a short time span in an area such as the German Bight (their example). The windfarm where this evidence was gathered, Horns Reef, was the largest windfarm in the world at the time with 80 turbines of 2MW each. In UK waters alone, the current programme of Round 3 aims to produce 25GW of energy, which could potentially result in the installation of 2500 turbines of 10MW. This could represent 30x the scale of development in Horns Reef.

The scale of the proposed developments in the North Sea (UK and neighbouring North Sea countries) with regards to the potential impacts on the harbour porpoise (and potentially seals and minke whales) cannot be taken lightly and strategic planning should be put in place to prevent the potential for displacing large numbers of animals from significant portions of the population's natural ranges, particularly in the central/southern North Sea (where most windfarms are currently planned) for large periods during the years of construction. JNCC would therefore like to see the SEA make recommendations on how/if the current programme could be achieved without causing this effect.

b) Population-level assessment and the PCAD framework

The only current framework to assess the potential impacts of noise at the population level is the PCAD framework – Population Consequences of Acoustic Disturbance (NRC 2005). JNCC recognises that it is a very difficult assessment to make and fraught with uncertainty; however PCAD provides the conceptual guidance for such an assessment. There are recent developments in knowledge that would allow at least having an idea of whether such predicted displacement of large numbers of porpoises could be of concern to the population. The results of such assessment would then inform whether certain restrictions would be needed at the strategic and regional level. Some degree of expert judgement would have to be employed, with uncertainty addressed through reasonable conservative assumptions.

² Tougaard, J., Carstensen, J., Wisz, MS Jespersen M, Teilmann, J. Bech NI, Skov, H. S., 2006a *Harbour Porpoises on Horns Reef - Effects of the Horns Reef Wind Farm*. Final report to Vattenfall A/S. **Roskilde, Denmark**. Also available at: www.hornsrev.dk.

Tougaard, J., Carstensen, J., Teilmann, J., & Bech, N. I. 2006b *Final Report on the Effects of the Nysted Offshore wind farm on harbour porpoises*. Technical Report to Energi E2 A/S. NERI, Roskilde (Also available at <http://uk.nystedhavmoellepark.dk>).

Other natural and anthropogenic pressures on population conservation status would also need to be considered. Knowledge of previously 'licensed disturbances' that are relevant to the populations should also be used in the assessment.

c) *Regional and strategic scenarios of windfarm construction*

The SEA presents an analysis of past pile driving hammer strikes per regional sea, and undertakes a prediction of shot and hammer activity associated with the proposed licensing round. This is welcome and does provide a perspective of the scale of the plan/programme. The use of different Y-axis between figure 5.10 and 5.11 (estimated number of pile-driving hammer strikes for constructed and consented windfarms) does mirror the huge difference in scale of the proposed programme with relation to what has previously taken place. However, we find it difficult to relate the measure of the predicted hammer strikes to the evidence on displacement of harbour porpoises, the type of assessment we think is lacking, as mentioned above.

Even though we recognise that the lack of definition of the actual programme brings difficulties, we believe that different temporal and spatial (and even technical) scenarios of construction could be worked through at a strategic (within a population natural range) and regional sea level. These would be useful, in addition to the hammer strike estimate, to assess the extent to which there is the potential for displacing large numbers of animals from significant parts of some regional seas and from the population's natural range for a significant proportion of the next 10 years. These scenarios would be based on how long pile-driving could go on for, where and when, alternative construction methods in some areas and the resulting potential displacement and numbers affected. If certain scenarios could result in significant effects for the population (at favourable conservation status), then the scheduling, the placing, the foundation method and the available techniques for reducing noise at the source (Nehls *et al.*, 2007)³, could be considered and adapted to reduce such risk.

A1.2 Assessment of the Risk of a Disturbance Offence

The approach taken in the SEA generally followed the JNCC's draft guidance on deliberate disturbance (March 2008), which addressed the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in 2007) and the Offshore Marine Conservation (Natural Habitats, &c.). These Regulations have since been amended in January 2009, to remove the concept of 'significant groups,' and therefore the guidance has been revised (publication imminent).

The fact that the disturbance offence now applies to any animals rather than 'significant groups', means that the SEA conclusions that "single seismic or pile driving sources are unlikely to have a significant disturbance effect" and "it seems improbable that (...) significant effects, as regulated under the Habitat Regulations and Offshore Marine Regulations, will occur" are now not appropriate. The SEA should be reviewed to take into account the 2009 amendments and follow the JNCC Guidance of 2009.

The risk of a disturbance offence will now depend very much on the scale of such activities and the species usage of the area where the activity takes place in. The guidance states that while the disturbance resulting from individual seismic surveys lasting for 4-6 weeks would not be likely to constitute an offence, the pile-driving in the construction of large offshore windfarms, which could last for many months, could constitute offence if likely to significantly displace animals. It is likely that individual developments could be exempt from such prohibitions through the issuing of 'wildlife licences', but one should not pre-empt

³ Nehls *et al.* (2007) Assessment and costs of potential engineering solutions for the mitigation of the impacts of underwater noise arising from the construction of offshore windfarms. COWRIE report

conclusions without undertaking project-specific licence assessments (3 tests, see JNCC Guidance) and considering the potential cumulative effects of a series of exemptions.

JNCC recognises that the Effects Threshold Level (ETL) concept would be a practical measure to use, however it does not allow for an estimate of the numbers likely to be affected by the injury or disturbance. These estimates will be an essential component of the information provided by developers to allow regulators to assess whether a wildlife licence can be granted or whether the granting of the licence could be detrimental to the maintenance of the populations at Favourable Conservation Status in their natural range. Additionally, keeping a record of the number of animals potentially affected is also essential to estimate the fraction of a population potentially being exposed to injury or non-trivial disturbance in any given year in order to avoid the risk of population-level effects. This is because the larger the proportion of a population that could be affected, the larger the risk of population-level effects.

A1.3 Potential Cumulative Effects

JNCC acknowledges that the UK provisions for species protection from disturbance might not be sufficient to deal with all the potential cumulative effects. Whereas it is now possible to regulate and keep a record of activities with the potential to cause non-trivial disturbance (that with the potential to be biologically significant, as defined in the regulations), the potential for a risk of cumulative effects to individuals and populations from multiple exposures to trivial disturbance remains unknown and therefore unregulated. An assessment should be undertaken of whether marine mammal populations in UK waters are being affected by additional cumulative effects of unregulated disturbance. JNCC recommends that this should be the starting point of a possible wider strategy of reducing particular types of noise where/if needed.

In the interim, and as a precautionary measure, JNCC considers that the concept of a pulse noise dose for certain areas could be considered further, and we suggest that placing limits on noise exposure to individuals and populations might be the most useful starting point to develop such a concept. This exposure dose would take into consideration species sensitivities and patterns in distribution and could inform the pulse dose. Simply placing limits on pulse dose without a reasonable biological justification would be likely to result in poor support and cooperation from industry and would not adequately protect species from disturbance.

A1.4 Areas of Sensitivity for Marine Mammals

JNCC welcomes the identification of key areas of marine mammal sensitivity to inform the potential management of noise. However, it is not clear from the SEA report how these areas would be used in the planning of where to place activities. Would these be areas to avoid or areas where exposure to noise would be capped, or both? Agreeing on the objective of such list of areas will be crucial to whether it can add any value to the protection of particular species or groups of species or whether it risks adding another complex layer of assessments or measures for little benefit. For example, it might be precautionary to limit noise exposure in areas where several species occur in high numbers on a regular basis and where the noise produced by each consented activity on its own would not reach disturbance offence thresholds (hence falling through the regulatory process). Conversely, in areas where windfarms are to be constructed and only harbour porpoises and minke whales are known to frequent the area, then JNCC deems the existing regulations and related assessments (in particular the FCS test) as sufficiently robust to ensure the protection of a species and its populations.

JNCC is also not convinced that all the key areas of marine mammal sensitivity proposed are justified by the evidence presented. The list of areas, and evidence supporting it, should be reviewed. For example, the Dogger Bank is listed as a key area for harbour porpoises, but the information provided in the annex and environmental report mentions (correctly) that according to latest census (SCANS II) the whole of the southern North Sea has higher densities for this species, compared to the northern north sea and particularly with the 1994 census (SCANS) – and not the Dogger Bank in particular. If particular measures are to be associated with such 'key sensitive areas' then the identification of those areas will be quite crucial. Wrongly identifying areas would risk displacing noise to a wider area, or prolonging its duration in the long-term.

JNCC would also like to see the SEA recommend that all areas where coastal bottlenose dolphins are known to occur frequently be avoided or that a limit on potential exposure is agreed in order to avoid chronic exposure or significant displacement. For this purpose we recommend adding the following areas to the list of those identified as key areas of marine mammal sensitivity: coastal areas from the Firth of Forth to the North of England, coastal areas from Cardigan Bay to Liverpool Bay, waters off Cornwall and around the western isles of Scotland; the latter two are areas where small groups appear to be semi-resident.

A2. Birds

The SEA concludes that “based on available evidence, displacement, barrier effects and collisions are all unlikely to be significant to bird populations at a strategic level”. Later it is stated that these effects are unlikely to be significant to birds at a population level (p127). It is unclear what is meant by a “strategic level,” and we have presumed that significant strategic effects implies having some form of population level effect?

Our principal concern with the SEA conclusion that there is unlikely to be a significant effect on birds, is the lack of available evidence in the form of synthesised post-construction monitoring reports from the UK. Available evidence is not appropriate for assessment of the impacts of the draft plan, due primarily to differences in scale and site characteristics. We provide further analysis and our own interpretation of the available evidence for displacement, barrier effects and collision risks. Our comments focus on identifying weaknesses and assumptions in the existing evidence base that require further work in order to manage the environmental risks they represent.

A2.1 Displacement effects of renewable developments

Specific to disturbance and displacement effects, there have been very few post monitoring studies which have increased our understanding of the likely effects as a result of renewables developments. We know that post-construction studies have demonstrated that disturbance and displacement effects do occur and that these are not restricted to the immediate vicinity of the windfarm area and can extend into a buffer zone of effect. For example, the monitoring from Horns Rev showed avoidance by common scoter and auks of areas up to 4km from the windfarm site (Drewitt and Langstone, 2006). In addition, the general consensus towards the assessment of direct and indirect habitat loss effects upon seabirds from offshore windfarms is dependent upon the assumption that all birds within the area are displaced. Although this approach is the 'worst case' scenario it is the current assessment approach advocated in Maclean *et al.*, (2008). So if the SEA followed the assessment approaches advocated i.e. that all birds are displaced from windfarm licence areas, and that these die upon displacement, can the conclusion be reached at this stage that effects will not be significant?

Furthermore, one of the key issues which we consider was not given enough consideration, is that displacement effects will affect different species in different ways, and will largely be dependent upon the availability and suitability of feeding habitats to which they are displaced. For example, species with very specific habitat requirements are likely to be more vulnerable to the effects of displacement than habitat generalists. Therefore, in our view, it is not really appropriate or possible to state that displacement effects are not likely to be significant [for all species] at a strategic/population level unless the differences in ecological requirements between species are more fully understood.

A2.3 Barrier effects

There is an urgent need for more detailed research to assess the impacts barrier effects can have on species survival and populations sizes. Until the results of such research become available any assessments made as to the significance of barrier effects, such as those made within this SEA are open to question. We would expect recommendations be made to propose research into developing a better understanding of the significance of barrier effects from renewable developments.

A2.4 Collision risk

The outputs of collision risk modelling are, as expected, highly dependent upon the parameters that are used within any given model. Factors such as 'avoidance rates' are key to assessing when impacts are likely to be significant upon seabird populations, or upon SPAs.

We are surprised, given the uncertainty that exists in methods to assess the collision risk for offshore seabird/geese, that the SEA has made a statement that there are not likely to be any significant effects associated with collision risk (at the 'strategic' level). Work is needed to address uncertainties that are inevitable when modelling data sets and interpreting their results. We emphasise the need to consider data as it is collected to ensure that assessment (and monitoring techniques) are continually developed to be fit for purpose. In our view, an important area for improvement not explicitly picked up by the recommendations would be the use of monitoring data to inform refinement of modelling assumptions.

A2.5 Use of a coastal buffer

The main outcome of the analysis on birds is to recommend a coastal buffer. Recommendations also need to recognise the value of having an evidence-based approach to bird sensitivities. For example, there is a possibility that impacts on birds in a particular area might be greater beyond the 12nm limit compared to within. We request emphasis instead on the need for studies of the use of the marine environment by birds, to highlight areas of importance such as feeding grounds, and the use of this information to influence location-specific decisions.

A2.6 Cumulative effects

Assessing the cumulative effect on birds at the project level will be essential and the SEA should consider how to enable the assessment and management of these effects more strategically. For example, are there broad scale surveys which are required which will provide a better basis for project level assessment?

A2.7 Offshore Vulnerability Index (OVI) and Data Needs

These comments overlap with those addressing Recommendations 8 and 17, below. We agreed that the OVI needs to be updated in consideration of the publicised changes in seabird numbers, distribution and breeding success. However, when incorporating new data, analysis is needed to ensure that the OVI model remains valid considering the varying methods used for data collection, e.g. the inclusion of aerial survey data. In our view industry and/or government should contribute to the required updating, including the cost of filling in any survey gaps.

Recognising the financial and time constraints of resurveying through an ESAS programme comparable to that which provided the data to inform the OVI, it may be more realistic to commission targeted ESAS surveys. Rationalisation of the spatial extent of the OVI, and therefore prioritising the data needs, may be possible by targeting areas where oil activity is prevalent, considering the risk of oil spills from drilling and production activities. We recognise that pollution arising from shipping presents a greater risk, however this approach would greatly reduce the target survey area, and the OVI data is used routinely in the management of impacts arising from oil industry activities, and not purely during incident response.

A3. Benthos

A3.1 Justification of Evidence

Several conclusions reached in this Section are unsupported by reference to relevant scientific literature. For instance, on page 104 it is stated that “*Sabellaria* reef is probably relatively tolerant of indirect disturbance, with high potential for recovery,” a statement which we may agree with but sufficient evidence needs to be presented to demonstrate how conclusions have been drawn.

A3.2 Impacts on Reefs (Page 104)

The SEA identifies fishing and aggregate extraction as those activities that have the potential to directly damage *Sabellaria* reefs. Renewable and oil and gas activities can also directly impact *Sabellaria* (and other biogenic) reefs if no appropriate mitigation measures are implemented, and this should be clearly stated within the SEA. We would also like to highlight that marine aggregate extraction activities in UK waters are subject to strict licence controls, and dredging permissions will only be issued if the proposed extraction activities are not considered to result in unacceptable environmental impacts. In this respect, operators are advised to apply mitigation measures to avoid direct damage to reef features in the first place.

The SEA only assesses the potential impacts on *Sabellaria spinulosa* reefs. Consideration should also be given to physical disturbance to other biogenic reef habitats such as *Lophelia pertusa* reefs.

Annex B- Additional General Comments

This Annex provides additional, more general comments.

B1. Natura 2000 and Appropriate Assessment

The probability of Appropriate Assessment being required for proposals that may adversely affect qualifying interests is recognised by the SEA, e.g. offshore wind proposals in the Dogger Bank (p155). However, the SEA does not reach any explicit and/or systematic conclusions on whether or not the plan/programme itself is likely to have a significant effect on specific qualifying interests of offshore Natura 2000 sites. Should it be considered necessary by the competent authority, JNCC is willing to work with DECC to ensure a robust audit trail for all qualifying features in the offshore sector is completed with respect to the overall plan/programme.

B1.1 'Appropriate assessments' to address disturbance of coastal bottlenose dolphin populations

JNCC does not consider that an 'Appropriate Assessment' is necessary or is the most adequate process to deal with the issue of disturbance of coastal bottlenose dolphins outside SACs. We consider that the disturbance regulations, which apply throughout the natural range of Annex IV species (e.g. all cetaceans) in UK waters, are the key framework to protect cetacean populations from non-trivial disturbance. The Appropriate Assessment process is of added value, but only relatively to avoiding significant disturbance to the species within the protected sites. The exception to this would be for activities outside the SAC that could have a significant effect on the site relative to the contribution this makes to the conservation status of the associated bottlenose dolphin population.

B1.2 Future Designations of N2K sites

A particular concern of JNCC's with respect to offshore sites is the fact that the boundaries of future offshore SPAs and a number of SACs have yet to be identified. In order to avoid an outcome whereby the plan/programme has unintended impacts on sites not yet identified, our view is that the recommendations flowing from the SEA need to address this risk in a reasonable manner. We are especially keen to ensure the SEA provides a framework that will enable developers to successfully progress project proposals within timescales that may include further evaluation during consenting if new N2K designations are proposed. Our comments, particularly on birds, should be considered in this context.

B2. Round 3 and the SEA (Section 2.4.3)

The draft plan/programme will require further rounds of offshore windfarm leasing. Crown Estate's Round 3 proposals have been developed, however there is only passing reference to them in Section 2.4.3 of the Environmental Report and it is clear that Round 3 is not integrated with the SEA. Ideally, Round 3 proposals would have resulted from the outputs of the SEA, incorporating recommendations and spatial analysis, thereby providing the essential next step towards achieving the aims of the plan/programme. It would benefit all stakeholders if the SEA clarified the iterative process by which the SEA's recommendations will be accounted for in the development of Round 3. If adequate integration was not achieved at this time, the SEA could also provide recommendations on how future leasing rounds should be fully integrated into the SEA process.

B3. Supporting innovation of new technology (Non-Technical Summary)

We note the observation in page ii of the Non-Technical Summary that the technology for offshore windfarms is continuing to evolve both in terms of structural options and techniques to monitor and mitigate environmental impacts. We recognise that market drivers are the principal reason for technological development, but highlight that regulators have a role to play in this. There is an opportunity for Government to collaborate with industry and research groups to facilitate innovation and ensure that new technological development are focused towards enabling environmental benefits, including at a strategic level.

An example relates to the uncertainties with respect to the impact of noise on marine mammals. These would be likely to be significantly addressed if pile driving was not required during installation, i.e. if alternative base structures were used such as gravity-base foundations. By being suitable for depths greater than 60m, alternative foundations may also increase options with respect to marine spatial planning, as this may increase the seabed area available for development of offshore windfarms. We would support a more explicitly focused recommendation for industry and government to seek ways to collaborate in order to enable development of new technologies that more effectively address environmental risks.

B4. Web-based Forum for Information Management

Although in principle the JNCC supports the development of a web-based forum for exchanging information on noise production and recording wildlife licences (mentioned throughout the report; including Recommendations 7 and 22), we would not have the resources to do this. Further, at this stage of the plan developing a web-based forum might not be a priority, and the primary focus should be on working with industry through scenarios of construction and undertake an assessment of potential cumulative effects based on these.

This relates to the wider need for facilitated data exchange and information management (reference also to Recommendation 9), and new initiatives should be developed with consideration for, and in co-ordination with, UK-wide data management policy and processes such as those covered by the Marine Environmental Data Information Network (MEDIN). Perhaps the SEA could provide a more direct recommendation about the needs of data management/sharing across the marine planning community?

B5. Biodiversity Indicators (Section 3.5 - SEA Objectives)

The SEA proposes as a biodiversity indicator, *“For selected ‘valued ecosystem components’ no loss of diversity or decline in population (measures as % of relevant biogeographic population) attributable to offshore oil and gas and wind farm activities and promotion of recovery wherever possible”* (Table 3.1). It is unclear what the SEA has considered to be “valued ecosystem components”. Furthermore, no recommendations are presented for how biogeographic populations of these “valued ecosystem components” could be estimated and subsequently monitored. If referring to protected species such as EPS, impacts should be assessed against Favourable Conservation Status (which in certain cases is related to % of the population), however, at the current state of knowledge, measuring the % of the relevant biogeographic populations for some species will be very difficult, if not impossible.

Finally, it will be very difficult to measure an indicator capable of distinguishing impacts attributable to offshore renewable and oil and gas activities from stresses caused by other anthropogenic impacts and natural changes.

B6. Relevant existing environmental problems (Section 4.3)

Table 4.1 (titled '*Environmental problems relevant to offshore oil and gas licensing and wind leasing*') is not clear, and we would welcome clarification of who is responsible for addressing these implications and how they will be delivered through the SEA Recommendations. For example, consider the problem "*vulnerability of seabirds and coastal water birds to pollution and disturbance from shipping and industry,*" where the implication is to: "*Review areas to be licensed for oil and gas or offshore wind activities and ensure awareness so that potential activities do not exacerbate problem.*" What do statements such as these mean, who is responsible for ensuring awareness, and how will this be delivered? We suggest that reference be made to the recommendations, and greater detail provided as to whom should be responsible for addressing these.

Again in Table 4.1, it is not clear how the proposed measure of "*Maintain awareness of research developments. Review potential blocks to be offered and ensure licensee awareness so that potential activities do not exacerbate problems,*" would be of any value to address the issue of "*Marine mammal sensitivity to disturbance, contaminants and disease.*" The statement is general and provides no helpful indication of what could be done to prevent disturbance, contamination and disease in marine mammals.

B7. EMF (Section 5.5.5)

The final paragraph on page 127 recommends that the research needs with respect to electromagnetic fields should be reviewed in the context of the DEFRA reviews of Round 1 and Round 2 monitoring. JNCC agree with this comment. It is not clear that this recommendation has been captured in section 6 of the report on Recommendations and Monitoring.

B8. Next Steps – Section 7

As part of the next steps it would be helpful if a vision for future SEAs of the offshore energy sector is provided. For example, if it is the intention to continue the integration of energy sources into single SEAs, how will future SEAs address wave and tidal?

Annex C – Specific Comments on the Recommendations and Monitoring

This section provides detailed comments on Section 6, Recommendations and Monitoring.

C1. SEA Recommendations

C1.1 Ownership of the Recommendations

JNCC welcomes the impact based approach contained within the SEA. In order to ensure that industry receives the maximum benefit from this approach it would be helpful if the implementation of the recommendations relates back to each of the oil and gas, carbon capture and storage and offshore wind sectors. The interpretation and recommendations relate mostly to offshore wind. This is understandable given the need to enable this new technology to meet targets set within the draft plan/programme. It does however mean that at a superficial level the other industries appear somewhat overlooked. For the recommendations to be effective it will be essential that there is clear ownership for their implementation, whether by government departments, agencies or by industry.

C1.2 Implementing the Recommendations

We welcome the provision of the broad range of recommendations as an outcome of the SEA process. It is our view that to be effective, the recommendations need to be incorporated into a sufficiently resourced implementation plan that can be effectively monitored and reviewed.

C1.3 Presentation of the Recommendations

The 23 recommendations could be presented in a manner that would enable clearer cross-referencing. The provision of a rationale that enables the recommendations to be considered in a more logical order than is currently apparent would facilitate an effective overview of their purpose and scope. For example, we have identified 3 main categories for the recommendations:

- The majority are concerned with addressing environmental risk by managing uncertainty (3,4,6,7,8,9,11,17,18,19,21 & 22);
- four principally relate to spatial planning (1,2,14,15);
- six to best practice/mitigation (5,10,12,13,20 & 23);
- recommendation 16 relates to clarifying statutory process.

For the recommendations concerned with addressing environmental risk, a number recommend improving the evidence base whilst others provide a rationale for applying the precautionary principle. JNCC consider that prioritising the recommendations would enable environmental risks that could potentially jeopardise implementation of the draft programme/plan to be more effectively managed. In that context those risks that can be addressed by an improved evidence base should be a priority for action. Ideally, future iterations of both spatial planning and best practice/mitigation recommendations will more effectively take account of environmental risk as uncertainty is addressed. The need for precautionary recommendations will be progressively minimised unless there is consensus that the benefits of a precautionary approach outweighs the costs/benefit of addressing uncertainty.

It may also be possible to summarise the recommendations within a table that clarifies to which sectors of offshore energy they relate and how they are to be implemented, resourced

and monitored. A more structured approach would help increase confidence that the recommendations can be acted upon and prioritised with a view to effective implementation.

C1.4 Recommendations arising from Supporting Evidence

The SEA describes the conclusions of several COWRIE studies without attempting to critically review those and come up with the specific recommendations from those studies that should be endorsed by the SEA Programme. For example, the SEA describes in section 5.3.4. the recommendations by Diederich *et al.*, (2008) for monitoring the potential impacts of windfarm construction on marine mammals, but it is not clear whether the SEA is recommending their adoption. The same comment applies for the description of the Nehls *et al.*, (2007) study on the effectiveness and costs of potential engineering solutions for the mitigation of the impacts of underwater noise arising from the construction of offshore windfarms. It would be useful if the SEA derived clear recommendations or endorsement of the studies reviewed.

C1.5 The Recommendations – Specific comments

- Recommendations 3 – In JNCC’s view, industry and regulators would benefit from clarification on the use of the precautionary principle, including how it is incorporated into ‘adaptive management,’ to effectively manage environmental risk. It would be helpful to develop some criteria that would enable decisions about when the precautionary principle should be used. Further, and more specifically, a reference here to the report section detailing the “areas known to be of key importance” is necessary.
- Recommendation 4 - Regarding the recommendation for a 12nm buffer zone around the coast, the value of an evidenced based approach to EIA of individual proposals should be acknowledged. JNCC would be concerned if this precautionary recommendation undermined an evidence based approach or if it resulted in proposals being located in offshore areas where they resulted in greater impacts. In addition, the 12nm buffer zone appears to be inconsistent with the licensing round currently being progressed in Scottish coastal waters and with Rounds 1 & 2.
- Recommendation 6 – JNCC recommend that in the final sentence “DECC” should be replaced with “relevant competent authority”, given that DECC will not be the consenting authority for all projects e.g. offshore wind over 100MW. We consider that further clarity on the consenting process would be valuable to industry, particularly detailing timescales for consenting, the role of the IPC and how appropriate assessment fits within the overall process for consenting (including the time required for any public inquiries).
- Recommendation 7 – We support the cross-industry co-ordination indicated in this recommendation but whilst willing to provide what support we can to enable this to happen, JNCC do not currently have the resources to host a web based forum (see related comments in B.4, above).
- Recommendation 8 – We are also concerned about the lack of recent data on waterbirds in offshore areas. However, in the current format this recommendation does not offer any viable solution as to how up-to-date waterbird data in the offshore environment can be obtained. It puts the onus on developers to obtain this information. Whilst it may be appropriate for renewable developers to collect ornithological data for the purposes of their baseline prior to a development,

individual oil and gas companies are not normally expected to collect seabird survey data before any developments.

Further, the current wording of this recommendation does not highlight the need for a collaborative approach between industry, Crown Estate and/or government to contribute to the collection of offshore seabird information. Offshore developers will inevitably focus on relatively localised areas of search, and if there is limited spatial coverage it is not always possible to make a valid comparison with the immediate vicinity. There is an opportunity for survey effort to be focused on spatial and temporal gaps such as those which have been identified through the SEA gap-analysis process. We would support proposals to fund organisations that can carry out European Seabirds At Sea (ESAS) type surveys. A priority should be to acquire data in areas of potential developer interest that have old or insufficient data.

- Recommendation 9 – We agree that there is a need to enhance datasets that will support future marine spatial planning. Government should consider the coordination of the several existing databases e.g. MEDIN & UKDMOS, its resource implications and an implementation strategy as a priority.
- Recommendation 11 - Regarding areas to the west of Hebrides, it is not clear what is being proposed to address the paucity of information or what criteria might be used to decide when sufficient information has been collated.
- Recommendation 14 – Whilst acknowledging the potential to reduce spatial conflict we consider it is also important to balance this against potential adverse impacts of co-locating renewable energy developments and Marine Protected Areas. There is a significant challenge in providing a robust evidence base that the objectives of both uses are coincident. The risk of a renewable energy development helping to meet conservation benefits of certain conservation features but potentially damaging others also needs to be recognised. There may be some Marine Protected Areas that are unsuitable for renewable energy development due to the particular conservation objectives for the site.
- Recommendation 15 – Although we are in agreement that with robust evidence, it is likely that developments can proceed in protected areas (and that future SPA/SAC designations can be made without significant effect on developing projects), there may be areas where development is deemed not suitable following an Appropriate Assessment, and this should be explicit here.
- Recommendation 17 – (This response has some overlap with A2.7 and that given to recommendation 8). JNCC agree that the Offshore Vulnerability Index (for the oil industry) should be updated in light of aerial and boat based survey data. Incorporating aerial seabird information into the ESAS database (which was used to develop the OVI) is possible providing that there is an accurate method developed for this (which in principle can be developed). Clarification of who would undertake a review and the allocation of resources is required.

With respect to the development of a Wind Farm Sensitivity Index there are particular challenges that need to be addressed, particularly the uncertainties involved due to the lack of data and the science of impact assessment. Such an index conceivably has the potential to inform temporal decisions such as construction timings, and determining when periods of shut down may be appropriate to mitigate collision risk (during migrations), but the level of detail needed for this would be equivalent to EIA resolution studies and therefore would be better assessed at this stage. Primarily,

JNCC consider that emphasis should be on improving baseline knowledge, potentially through regional level assessments, to highlight key species of concerns for siting decisions and in respect of consenting decisions.

- Recommendation 21 – Regarding increased understanding from site surveys and studies, it is not clear how the costs of carrying out this useful piece of work will be met.
- Recommendation 22 – JNCC welcome the consideration of approaches to address the potential for cumulative effects of noise on marine mammals. However, the proposal to establish operational criteria in key sensitive areas needs careful consideration and might only be useful in certain situations. Clarity would be welcomed on how this would add value and could be achieved through the current regulatory framework, as proposed. (See B4 for comments on the web-based forum).
- Recommendation 23 – Regarding the Habitats Directive, we agree that the adoption of consistent guidance should prove helpful. In that context it will be important to note the technical differences in devolved Scottish statute. Guidance to industry on if/how these technical differences will affect their management of environmental issues would be helpful.

C2. Monitoring (Section 6.2)

A concern of ours relates to monitoring of impacts of windfarm construction. JNCC's understanding is that not all the monitoring recommended in relation to previous SEAs and windfarm licensing rounds has been carried out. The monitoring review of FEPA conditions for offshore wind developments currently being carried out by CEFAS should provide a useful update. There is a risk that lack of monitoring could result in delays to future projects because of continued uncertainties with respect to potential impacts, which may result in unnecessarily precautionary recommendations. In line with government initiatives to streamline the consents regime, the monitoring of construction impacts of built windfarms needs to be coordinated and focused to address these important areas of uncertainty. This needs to be more explicitly addressed as either a recommendation or in the monitoring section, under effects. Effects monitoring could more explicitly seek to address the risk of unforeseen environmental outcomes.

Annex D – Comments on Appendices

This Annex contains a number of points relating to some of the Appendices of the Environmental Report.

D.1 Appendix 3a.2 – Benthos

The text in this section seems disjointed and the clarity of the Regional Sea sections might have been improved if the same structure had been followed for each. Although a wealth of useful information is provided, it would be helpful to provide maps where survey results are summarised showing the area discussed, to facilitate understanding.

We have noted several inaccuracies in the text, some of which are summarised below. We recommend that the Appendix is checked thoroughly before finalising.

Specific comments:

D1.1 In some of the Regional Sea sections, benthic habitats and communities are described separately for “offshore” and “nearshore” areas. In a regulatory context, the offshore area comprises waters beyond 12nm. It is unclear whether the SEA uses the same definition. We therefore recommend clarifying what is meant by “offshore” and “nearshore”.

D1.2 Page 19 (A3a.2.4.2): Both the Braemar and Scanner pockmark areas have been approved by the UK Government for designation as SAC. They were submitted to the EU Commission in August 2008 and are currently candidate SACs.

D1.3 Page 21, paragraphs 2 & 3 (A3a.2.5.1): These paragraphs describe statistical analyses undertaken to characterise the epifaunal communities in the North Sea but do not provide any environmental information. It remains completely unclear which are the characterising species of the epifaunal communities of Regional Sea 2.

D1.4 Page 21 (A3a.2.5.2, Offshore sandbanks): CEFAS, BGS and Envision Ltd. on behalf of JNCC have recently completed an information gathering exercise that provides better resolution of the geomorphological and biological baseline of the Dogger Bank dSAC⁴. This new information should be taken into account prior to finalising the SEA document. Copies of the report are available on request from JNCC’s Marine Protected Site Team (offshore@jncc.gov.uk).

D1.5 Page 25 (A3a.2.6.1) & Page 26/27 (A3a.2.6.2): Information from the Eastern English Channel Marine Habitat Map project (James *et al.*, 2007) should have been used and referenced as an additional source of information for the Section covering Regional Sea 3⁵.

D1.6 Page 56 (A3a.2.12.3, Banks and seamounts): We consider that more information on the Hatton Bank should be provided within the final report. A comprehensive summary on the environmental baseline of the Hatton Bank can be found in the SAC Selection Assessment document for the Hatton Bank dSAC (http://www.jncc.gov.uk/pdf/HattonBank_SelectionAssessment_1.0.pdf).

⁴ Diesing, M, Ware, S., Foster-Smith, R., Stewart, H., Long, D, Vanstaen, K., Forster, R. and Morando, A. (2009). Understanding the marine environment – seabed habitat investigations of the Dogger Bank offshore draft SAC. Joint Nature Conservation Committee, Peterborough. JNCC Report No. 429, 89 pp., 5 Appendices.

⁵ James, J.W.C., Coggan, R.A., Blyth-Skyrme, V.J., Morando, A., Birchenough, S.N.R., Bee, E., Limpenny, D.S., Verling, E., Vanstaen, K., Pearce, B., Johnston, C.M., Rocks, K.F., Philpott, S.L. and Rees, H.L. (2007). Eastern English Channel Marine Habitat Map. Sci. Ser. Tech Rep., Cefas Lowestoft, 139: 191pp.

D1.7 Page 57 (A3a.2.13.1, *Sabellaria* reefs): References should be provided for the ecological functioning and distribution of *Sabellaria spinulosa* reef (paragraph one & two of this section).

D1.8 General: It should be noted that both Natural England and the JNCC will be commencing consultation (on behalf of Defra) on the designation of a series of new SACs. Information on these sites will shortly be available (end of April 2009) on the Natural England and JNCC websites. We consider that the final SEA report should consider these new potential conservation sites.

D2. Appendix 3b – Geology, Substrates & Coastal Geomorphology

D2.1 Page 266 (A3b.3.5, Reefs): The SEA correctly identifies Pobie Bank as an area containing potential Annex 1 reef habitat. Please note that JNCC are currently reviewing the results of a contract that analyses existing data from surveys conducted on Pobie Bank.

D2.2 Page 271 (A3b.3.9, Sandbanks and sandwaves): The SEA states that “The covering of sandy sediments in shallower <20m depth areas to the south west and its associated benthic fauna ... falls within the Annex I classification”. Please be aware that the 20m depth contour does not define the shallow sandbank feature for which the Dogger Bank dSAC is recommended. The 20m depth contour has been used by JNCC, following European guidance, as an indicator to help identify areas which may qualify under Annex I of the Habitats Directive as ‘Sandbanks which are slightly covered by seawater all the time’. Such sandbanks can extend beneath 20m below chart datum where these areas are part of the feature and host its biological assemblages - and this is the case for the Dogger Bank dSAC. We would welcome if this paragraph could be amended considering the above comments. This also applies to other sections of the SEA where reference is made to the 20m contour.

D2.3 Page 274 (A3b.4.3 & A3b.10.1, Reefs and seabed features): We note that the SEA refers to Johnston *et al.*, 2002 as the main reference for the spatial distribution of potential Annex I habitats in UK waters. Please be aware that since publication of this report substantial progress has been made with regard to the identification of Annex I habitat, and we consider that this should be acknowledged in the SEA. Up-to date information on the marine SAC work programme can be found at JNCC’s website and Committee Papers (follow links at <http://www.jncc.gov.uk/page-1445> & <http://www.jncc.gov.uk/page-2671>). Within the Eastern English Channel, the Median Deep is no longer under consideration as potential SAC for Annex I reef habitat (<http://www.jncc.gov.uk/pdf/comm06n09.pdf>) but the Wight-Barfleur reef is currently classified as an Area of Search (AoS) containing potential Annex I geogenic reef habitat (http://www.jncc.gov.uk/PDF/comm_08P14a.pdf). Within the Rockall Trough & Bank Regional Sea, the Anton Dohrn and George Bligh area are currently classified as offshore AoS for bedrock reef. Hatton Bank has now been formerly advised to Defra as dSAC.

From: Kate Eldridge
Sent: 07 February 2009 15:03
To: sea.2009@berr.gsi.gov.uk
Subject: Offshore Energy SEA Consultation

Dear Sirs,

I am in very much favour of the aims to reduce the UK's CO2 emissions and improve our energy security so we are not as reliant on foreign countries/companies for our energy requirements.

I support offshore wind energy and the plans to enable further rounds of offshore wind farm leasing in the UK Renewable Energy Zone and the territorial waters of England and Wales with the objective of achieving some 25GW of additional generation capacity by 2020. I agree that there should be buffer zones to take into account local wildlife but the target of 25GW should still be met. As the UK's target is 15% of energy from renewables by 2020, will 25GW be enough, taking into account energy use reductions, renewable energy generation from onshore wind and solar power?

With regard to offshore oil and gas, I would prefer that the UK made use of its own oil and gas reserves rather than relying on other countries, however, I do not agree that the UK should be committed to a prosperous oil and gas industry. The industries should be winding down as the UK improves energy efficiency and derives greater proportions from renewables. In relation to gas storage, I agree that resilience of supply should be maintained to prevent gaps during cold times.

Many thanks
Kate Eldridge
Hazel Grove

This email has been scanned by the MessageLabs Email Security System.
For more information please visit <http://www.messagelabs.com/email>

From: Renata.Gavelkova
Sent: 27 February 2009 12:27
To: sea.2009@berr.gsi.gov.uk
Subject: Odp: UK Offshore Energy - Strategic Environmental Assessment

Good afternoon,

on behalf of the Ministry of the Environment of the Czech Republic, we appreciate that you've provided us the opportunity to participate in the SEA process in UK. The Department of environmental impact assessment, unit of SEA came to the conclusion that draft plan/programme to enable further leasing for offshore wind and licensing for offshore oil and gas, including the underground storage of combustible gas in partially depleted oil/gas reservoirs can't has a significant effect on environment in the Czech Republic. Therefore, **the Czech Republic doesn't wish to comment** on the Environmental Report or the draft plan/programme in question.

Best regards,

Renata Gavelková
Department of environmental impact assessment
unit of SEA
Ministry of Environment of the Czech republic
Vršovická 65, 100 10 Praha 10



Liberté - Égalité - Fraternité
RÉPUBLIQUE FRANÇAISE

MINISTÈRE DE L'ÉCOLOGIE, DE L'ÉNERGIE,
DU DÉVELOPPEMENT DURABLE ET DE L'AMÉNAGEMENT DU TERRITOIRE

Commissariat Général au Développement Durable

Paris, le **20 AVR. 2009**

Service de l'Économie, de l'Évaluation
et de l'Intégration du Développement Durable

Sous-direction de l'Intégration des Démarches
de Développement Durable dans les Politiques Publiques

Bureau de l'Agriculture, de l'Industrie et des Infrastructures
Énergétiques

La Commissaire générale au développement
durable

au

Département Britannique de l'Énergie et du
Changement Climatique

Référence : IDDPP3 / IDDPP3-09-44-YA_Avis programme UK_v3.doc
Vos réf. :

Affaire suivie par : Yvan Aujollet
yvan.aujollet@developpement-durable.gouv.fr
Tél. 01.40.81.85.83 - Fax :

Objet : Avis sur le Plan/programme offshore britannique (art 7 directive 2001/42/CE)

La directive 2001/42/CE relative à l'évaluation des incidences de certains plans et programmes sur l'environnement (transposée par ordonnance n°2004-489 du 3 juin 2004) prévoit l'évaluation de l'impact environnemental d'un certain nombre de plans et programmes afin d'intégrer les impacts environnementaux dans la conception même de ces plans et programmes.

Conformément à l'article 7 de la directive 2001/42/CE, le Département anglais de l'Énergie et du Changement Climatique a saisi par message électronique (copie en annexe), le 27 janvier 2009, les États membres de l'Union Européenne pour qu'ils émettent un avis **avant le 22 avril 2009** sur un projet de Plan/Programme marin de prospection off-shore (éolien, pétrole, gaz et stockage de gaz) dans les eaux côtières et territoriales britanniques.

Dans ce cadre, vous trouverez ci-joint l'avis établi par les autorités françaises en charge de l'évaluation environnementale.

L'examen du dossier que vous m'avez fait parvenir m'amène à formuler plusieurs remarques.

1. Cartographie

D'après les cartographies contenues dans ce plan, les zones de prospection jugées favorables aux projets éoliens, pétroliers et gaziers se limitent actuellement à la mer territoriale britannique. Ces éléments ne présentent pas de difficulté particulière au regard de nos préoccupations nationales.

Néanmoins, la zone énergie renouvelable (ERZ) définie par l'« Energy Act 2004 » qui s'étend de 12 à 200 milles pourrait susciter des inquiétudes, liées notamment à l'impact que les futures installations éoliennes offshore sont susceptibles d'avoir sur le trafic maritime et les rails de navigation. L'ERZ, qui s'appuie sur les limites du plateau continental, devrait permettre avec l'évolution des techniques d'implantation la mise en place de parcs éoliens dans une zone où le trafic maritime est particulièrement dense.

**Présent
pour
l'avenir**

Or, les effets des champs d'éoliennes sur les instruments de radionavigation des navires sont loin aujourd'hui d'être techniquement maîtrisés. Les préconisations définies par les autorités britanniques en la matière ne permettent que d'atténuer les effets de masquages et les phénomènes de doubles échos produits par les champs d'éoliennes sur les écrans radars.

Si dans un futur proche, les autorités britanniques envisageaient l'implantation de parcs éoliens en ERZ dans une zone de fort trafic maritime, il conviendrait dès lors d'être vigilant sur les impératifs de sécurité maritime.

2. Impact sur les zones sensibles des eaux marines françaises (sites Natura 2000, convention OSPAR)

En application des directives communautaires « Habitats-faune-flore » et « Oiseaux », les Etats-membres se sont engagés à constituer un réseau cohérent de sites Natura 2000 en mer d'ici mi-2008. La France a donc lancé un processus lui permettant de proposer un ensemble cohérent de sites à l'automne 2008, sur la base des meilleures informations scientifiques disponibles. Ainsi, suite à la circulaire du 20 novembre 2007, les préfets ont mis en consultation 100 projets de sites Natura 2000 en mer. Parmi les 100 propositions, 76 sites Natura 2000 en mer (29 Zones de Protection Spéciales et 47 propositions de Site d'Importance Communautaire) ont été notifiées à la Commission européenne le 31 octobre 2008 (voir <http://www.natura2000.fr/>), 4 projets de sites nécessitent l'élaboration d'une proposition commune (désignation et gestion) avec le Royaume-Uni (« Ridens et dunes hydrauliques du Détroit du Pas de Calais ») et l'Espagne. D'autres projets de sites en mer sont également en cours de préparation en vue d'un envoi prochain à la Commission européenne (voir <http://www.aires-marines.fr/>).

En ce qui concerne les sites Natura français (4 potentiellement) à proximité des sites britanniques, le document proposé devra faire l'analyse des impacts susceptibles d'affecter de manière significative les habitats et espèces ayant justifié la désignation des sites par la France.

Il a été noté que le document britannique s'est engagé à effectuer une évaluation des incidences Natura 2000.

Natura 2000, dans une logique de développement durable, vise à concilier les enjeux de développement économique avec la préservation de milieux naturels remarquables. Ce dispositif n'interdit donc pas, a priori, le maintien, le développement ou l'installation d'activités économiques. Il prévoit par contre que tout projet de travaux ou d'aménagement est soumis à une évaluation de ses incidences écologiques. S'il s'avère que le projet ne porte pas atteinte à l'intégrité du site, il peut être autorisé. Dans la négative, le projet sera soumis aux conditions fixées par l'article L.414-4 du code de l'environnement.

De plus, les programmes ou projets situés hors d'un site Natura 2000 peuvent rentrer dans le champ de l'obligation de réaliser une évaluation d'incidence dans la mesure où ils sont susceptibles « d'affecter de façon notable un ou plusieurs sites Natura 2000, compte tenu de la distance, de la topographie, de l'hydrographie, du fonctionnement des écosystèmes, de la nature et de l'importance du programme ou du projet, des caractéristiques du ou des sites et de leurs objectifs de conservation ».

3. Avis sur les impacts du Plan-Programme offshore sur le transport des sédiments et la géomorphologie des fonds marins

L'examen de l'appendice "3b- Geology, substrates and coastal geomorphology" et du rapport environnemental du document conduit, au regard des éléments présentés, à considérer que les impacts majeurs du Plan-Programme offshore sur le transport des sédiments et la géomorphologie des zones sous marines auront lieu lors de la phase d'installation des infrastructures offshore. Ils seraient, selon certaines observations, comparables aux effets produits par les vagues lors d'une très forte tempête et les bancs de sable affectés seraient stabilisés en moins de 5 ans (entre 1 et 5 années).

Néanmoins les modalités de montage des infrastructures et des mesures de mitigation (« scour protection in the form of gravel, rocks, sandbags, gabions, pre-formed concrete blocks and fronts mats ») sont de nature à réduire les impacts négatifs de l'implantation des infrastructures sur la géomorphologie des fonds marins et les transports de sédiments.

Durant la phase d'exploitation, des modifications très localisées des bancs de sédiments seront ensuite observées (formation de « bedform tail » au pied des piles). Globalement les effets sur les bancs de sable de ces activités offshore sont considérés comme mineurs voire négligeables et cela en comparaison des activités de pêche dont le effets négatifs sur les fonds sédimentaires sont largement supérieurs.

Par ailleurs, la préconisation du choix de l'alternative 3 (« to restrict the areas offered for leasing and licensing temporally or spatially ») est celle qui en terme d'impacts sur la géologie et de sédiments a le moins d'impact (« potential minor negative impact on topic »).

Au regard des impacts ponctuels dans le temps et l'espace, on peut en déduire implicitement qu'aucun impact sur les transports de sédiments à l'échelle de la Manche et de la Mer du Nord n'est attendu et que le Plan-Programme offshore n'aura dans sa phase d'exploitation que des impacts très localisés en ce qui concerne cet aspect.

4. Conclusion

Le rapport environnemental (p. 213) conclut en disant que la troisième de trois alternatives envisagées au départ semble préférable.

Par contre, l'évaluation stratégique n'a pu conclure qu'à une série de recommandations faute de travailler sur un plan et programme qui auraient pu mieux localiser les zones pressenties.

Ainsi, s'il est a priori souhaitable que la plupart des recommandations soient effectivement suivies, il reste une incertitude des projets qui rendront d'autant plus nécessaires les procédures de consultations transfrontalières des projets sur l'impact futur lors de leur élaboration.

P/0

La Commissaire générale
au développement durable

Michèle PAPPALARDO

Copie :

- Monsieur le Secrétaire général de la Mer

16, Boulevard Raspail

75007 Paris

- Monsieur le Directeur Général des Infrastructures des Transports et de la Mer

- Monsieur le directeur des affaires maritimes

Arche Sud

Le parvis de la Défense

92800 Puteaux

- Monsieur le Directeur Général de l'Energie et du Climat

- Monsieur de Directeur des Affaires Européennes et Internationales

- Sous- direction Régulation européenne

- Monsieur le Directeur des Affaires Juridiques

- Monsieur le Directeur Général de l'Aménagement, du Logement et de la Nature

- Direction de l'eau et de la biodiversité
- Direction de l'habitat, de l'urbanisme et des paysages

- Monsieur le Directeur Général de la Prévention des Risques

- Service des risques naturels et hydrauliques

- Monsieur le Préfet maritime de la Manche et de la Mer du Nord

50115 Cherbourg Armées

- Monsieur le Préfet maritime de l'Atlantique

Place du Château

29200 Brest

- Monsieur le DIREN de Basse-Normandie, déléguée de façade Manche Mer du Nord

- Messieurs les DREAL Bretagne et Nord-Pas-de-Calais.

- Monsieur le Directeur régional des affaires maritimes Haute-Normandie

4, rue du Colonel Fabien

76083 Le Havre Cedex

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR
Fax: 01224 254019

Offshore Energy SEA Consultation

NATS En Route Ltd (NERL) response to UK Offshore Energy Strategic Environmental Assessment

NATS En Route Ltd (NERL) recognises the benefits of wind turbines in addressing the UK's commitment to reduce carbon emissions and is committed to work with all stakeholders to secure a better environmental future. Indeed, as a company, we have become the first Air Navigation Service Provider to set environmental targets both for our own estate and for the ATC service we provide to our customers.

NATS has pledged that our estate will be carbon-neutral by 2011 and that by March 2020, we will have co-operated with the industry in reducing ATM CO₂ emissions by an average of 10% per flight (against a 2006 baseline). In this area our immediate priorities are to increase environmental awareness within our air traffic operation, identify priority areas for improvement across our network whilst continuing to deliver emissions benefits now and planning for the delivery of longer term opportunities.

NERL provides air traffic services across the UK and surrounding high seas airspace as well as across the north-eastern quadrant of the North Atlantic. To do this, it relies on a communication, navigation and surveillance (CNS) infrastructure as well as associated data processing systems. Our licence requires NERL to safeguard the CNS facilities it

operates, not only for its own air traffic services but for the benefit of the UK as a whole.

The primary concern for NERL remains aviation safety and NERL is continually striving to improve safety levels whilst meeting future ATM demands. In this respect NERL has made significant investments to ensure that these levels are maintained and this includes replacing and upgrading all of its current radars. NERL is mindful that windfarm developments can impact our CNS infrastructure, particularly our Primary Surveillance Radar (PSR) which can be affected in the following ways:

- The windfarms can return the transmitted signal and are processed as an object. This is displayed as clutter.
- The characteristic of the rotating blades defeats moving target processing and for large windfarms the resultant tracks can appear as real targets.
- If the windfarm is large, the radar receiver can become saturated and the performance of the system becomes degraded.
- The windfarm can shield aircraft operating behind the site at low level.

NERL has produced a Policy Paper which sets out in more detail, the impact of windfarm generated clutter on the safety of our Air Traffic Service, the desire to pursue a strategic UK technical solution to the problem of clutter on PSR (known as the 'Raytheon solution') and a set of criteria which a developer would need to address should they wish to pursue a site specific solution to a potential impact.¹ With Raytheon NERL is keen to ensure that the development and introduction of the solution is of benefit to our business by being both cost and performance neutral.

With respect to the Government's 2007 White Paper to meet the energy challenge and specifically off-shore windfarm developments, NERL is pleased that the DECC/SEA authors have recognised the impact of wind

¹ http://www.nats.co.uk/text/248/nats_and_windfarms.html

turbines on aviation and surveillance radar and that these concerns have been captured in the consultation. Specifically within the Round 3 off-shore programme, we have assessed that some zones in the plan will have a technical and operational impact and at an early stage NERL has been actively engaged with Crown Estates to achieve a common understanding of the impact. We are both working towards a suitable mitigation that will enable renewable energy development whilst ensuring NERL continues to provide a safe and efficient air traffic service.

NERL welcomes the opportunity to respond to this consultation. Following our review of the SEA report, we would like to highlight what we believe to be a number of errors and would also be grateful for clarification on a number of points:

General

- Clarification of the use of NATS and NERL throughout the document. It could be easier to simply refer to us as NERL.
- Whilst the majority of our concerns are related to primary surveillance radar it should be noted that developments closer to the UK land mass have equal potential to degrade communication, navigation and secondary surveillance radar performance. These areas are included in the maps.

Specific

- The draft plan/programme does not include the territorial waters of Scotland and Northern Ireland (ref Non-Tech summary page ii). It should be noted that NERL comments made with respect to the offshore SEA would be relevant for these zones as well.
- The report makes reference to the CAA position on 6nm zones in and around offshore oil/gas operations. There is no mention of protection for the airspace routes joining the platforms to the mainland, which are

not seen by NERL primary surveillance radars and are often flown at turbine height. Helicopter operators would almost certainly have a view on the safety of their operations in the vicinity of these routes but we are not sure whether they or the Civil Aviation Flight Operations department have had a chance to respond to this consultation.

- Page xviii of the Non-Tech summary refers to "Area wide mitigation solutions for potential radar interference may be possible but require pilot studies and trials". Investment would also be required for these solutions.

Appendix 3 – Environmental Baseline page 441 A3h.3 Aviation.

- In the second paragraph wind-turbines and turbine motion do not generate an electromagnetic signal.
- In the third paragraph and the aviation related constraints map, there seems to be both 15km & 17km stated as the consultation area.
- In the fourth paragraph the reference to the Raytheon Solution should read "NERL and its radar sensor provider Raytheon have identified a number of potential solutions to mitigate the effects of wind-turbines on its en-route primary surveillance radar systems. This work has been proposed as a research and development programme under the Aviation Plan (ref BERR website) and is pending confirmation of funding availability (as of March 2009)."
- In the fourth paragraph we are not clear on the reference to 'output stage radar data'. Suggest that this is deleted.
- NERL have provided technical line of sight maps to the SEA author and the Crown Estates indicating the areas where our primary surveillance radar network will see turbines at different tip heights up to 200m. These maps provide technical line of sight from our primary surveillance radar network and zones where there is an operational impact to en-route air traffic control. These will shortly be available on the NATS web site.²

² http://www.nats.co.uk/text/248/nats_and_windfarms.html

Once again thank you for providing us with the opportunity to comment on your report.

If you require clarification of any of the issues or comments we have raised in our response then our NERL safeguarding experts (natssafeguarding@nats.co.uk) would be more than happy to continue dialogue and provide input to any future activities.

Robert Westerberg
Policy Support

NATS
4000-4200 Parkway,
Whiteley,
Fareham,
Hampshire,
PO15 7FL.

Tel: 01489-616375
E-mail: rob.westerberg@nats.co.uk



OFFSHORE ENERGY SEA CONSULTATION

1. Introduction

The Department for Energy and Climate Change (DECC) is undertaking a public consultation on the Offshore Energy SEA Environmental Report of a draft plan/programme to enable further rounds of offshore wind leasing and offshore oil and gas licensing in UK waters.

The NFFO is the representative body for fishermen in England, Wales and Northern Ireland. Our member vessels range from 40 metre stern trawlers operating at North Norway and Greenland to small, under 10metre vessels, beach launched and with limited range. The Federation holds seats on the EC Advisory Committee for Fisheries and Aquaculture, and the North Sea, North West Waters, Pelagic and Long Distance regional advisory councils. The NFFO is also a member of Europeche, the European trade federation for the fishing industry.

Consequently, the NFFO has considerable interest in the SEA as it relates to fisheries and particularly with respect to the future leasing of offshore wind farms.

2. Fisheries Displacement and Associated Impacts (Environmental Report, 5.7.1)

The SEA provides commentary and recommendations relating to the interactions with fishing activity in the Environmental Report (5.7.1, 5.7.3, 5.7.4, 5.7.5, 6.1) and the Appendix (A3h.13).

The report recommends there:

“should be a presumption against Offshore Wind Farm developments which... occupy recognized important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede previous activities) (Environmental report p213).”

The NFFO welcomes the recognition that in principle important fishing grounds should be avoided. The report recognises that:

“Inshore fisheries may be particularly vulnerable to spatial exclusion as these smaller vessels are unable to travel further afield to fish new grounds.” (Appendix 3h, p286)

The NFFO support this statement, which highlights a very significant element of fleet vulnerability, and welcomes the recommendation to apply a coastal buffer of 12nm (Environmental Report 5.7.3 and 6.1) that will help to address this. However, the report does not mention other factors that can also affect vulnerability to displacement. These, for instance, include the distribution of the fisheries affected. Shellfish grounds tend to be limited in their distribution and the use of static gear (e.g. pots, static nets) in particular can limit opportunities to relocate to alternative fishing grounds as static gear may not be compatible with existing activity in the area. The availability of alternative grounds may be further limited by market access or regulations in force.

Navigation around structures to reach fishing grounds will also have operational impacts upon local fishing fleets, particularly if located in the coastal zone, although the proposed coastal buffer zone would help to limit this effect.

A displaced local fleet potentially places at risk the continued viability of the fishing port with its constituent port facilities and onshore businesses dependent upon the landings of the local fleet concerned. This would have knock-on effects to the local economy and the social fabric and skills base of affected coastal communities.

The report recognises that:

“exclusion in some areas is likely to result in negative effects on other fishing grounds through displacement of effort.” (Environmental Report p163)

To provide clarification to this statement, displaced effort can have environmental implications if activity is displaced from important fishing grounds to areas where environmental impacts are greater or effort is concentrated onto remaining accessible areas, leading to local resource depletion. Greater conflict with other fishing fleets can also occur as a result of displacement.

3. Spatial Constraints Analysis

Although the report recognises fishing is a key spatial constraint factor (Environmental Report, p149), it was not included in the constraints mapping analysis (Environmental Report, 5.7.2). The report goes on to acknowledge that:

“Vessel Management System (VMS) data has substantially improved understanding of the spatial and temporal distribution of larger fishing vessels (>15m from 2005); however, the distribution of smaller vessels (which

dominate the UK fleet by numbers) is less well understood.” (Environmental Report, P149).

Furthermore:

“At a strategic level, it is not feasible to identify all such grounds; small, inshore vessels operate at almost all ports throughout the UK, although those in remote and rural areas are likely to be most sensitive. At region- and site-specific levels, early consultation with relevant SFCs and fishermen, will facilitate the identification of these locally important areas.” (Environmental Report p118).

While the NFFO believe that such a large development programme as proposed for offshore wind farms should have addressed the absence of detailed knowledge of the spatial sensitivities of the fishing industry (as is expected to occur under the Marine Conservation Zone (MCZ) planning process), the NFFO strongly endorse the aforementioned recommendation to consult at the earliest opportunity, both to address this deficiency and to follow best practice procedures.

In addition, the use of chart outputs on the spatial distribution of fishing activity prepared under the SEA should be subject to careful interpretation in collaboration with industry stakeholders, given the limitations of the underlying data used and as such outputs provide only a proxy for the spatial sensitivities of the industry as highlighted above. A more detailed description of the methodology used in deriving chart outputs from Vessel Monitoring Scheme (VMS) and log book data would highlight the limitations of the procedure used and facilitate correct interpretation. Some of these limitations include:

- Poor spatial resolution of non-VMS data units. Effort and landings data are mainly reported to ICES rectangles (approximately 30nm²).
- Limited time series of data particularly for VMS and under 10metre fleet data.
- Limited attention given to international fleet activity which would considerably alter the results of fisheries spatial analyses.
- No analysis of seasonality which would inform development planning time frames.

The NFFO believe that spatial constraints analysis should take into account the vulnerability of the fleet to displacement. Within the SEA spatial analysis of fishing activity addresses only the distribution of fishing effort. It is worthwhile noting the preparation of fisheries data layers recently produced under a COWRIE contract¹ which attempt to derive layers based on spatial financial value derived from effort and landings data. As with the SEA fisheries mapping work, careful interpretation is required and should be undertaken in conjunction with the fishing industry.

It should also be possible to resolve spatial data sets to facilitate the identification of stakeholders at the local level.

¹ http://www.offshorewindfarms.co.uk/Pages/Projects/Research_project_areas/Data/

The Regional Advisory Councils (North Sea RAC and North Western Waters RAC) are appropriate forums to facilitate engagement with international fisheries stakeholders.

4. Fishing Compatibility

The report observes that from stakeholder discussions:

“Risk was perceived to increase significantly if fishing within a wind farm; different fishermen have different perceptions of risk, with some willing to take more risks than others - it is considered inappropriate to define one type of gear as compatible with offshore wind farms and another as incompatible. Mobile gears such as trawls or drift netting were generally not considered possible” (Environmental Report p163).

While the NFFO supports the statement above, we underline that coexistence between both the fishing and offshore wind industries will be best achieved by good location decision-making to minimise conflict, rather than through post-site selection mitigation measures. The presence of wind farm structures inevitably increase safety risk, and their physical presence in most cases will limit fishing opportunities.

The report recommends that:

“To minimise habitat change and to ensure areas developed as a result of the current draft plan/programme are left fit for previous or other uses after decommissioning, the volumes of rock used in cable armouring, foundation scour protection and pipeline protection must be minimised and there should be active promotion of alternative protection methods through the consenting process.” (Environmental Report, p214)

In the interests of minimising safety risk, the NFFO urge this recommendation should be extended as follows:

- cabling within and between windfarms and to the shore should be buried.
- a clear seabed policy should apply to the decommissioning of windfarm structures.

5. Reef Effects

The report remarks that windfarms may act as artificial reefs encouraging the abundance of fish and shellfish (p163 and Appendix A3h.13.15.1, p523). As windfarms are not presently planned together as part of a coherent marine conservation strategy, the NFFO maintain that such effects where they did occur would be incidental and such considerations should not supersede the priority to minimise spatial conflict with fishing activity through good site selection decision-making.

6. Electromagnetic Fields (EMF) (Environmental Report: 5.5.2.6)

The report recognises the potential for behavioural impacts to electrosensitive species, but there presently is no conclusive evidence of its effects and:

“further research is required to investigate the potential significance (if any) of artificial electric and magnetic fields for marine organisms.” (Environmental report p118).

The report goes on to recommend that:

“attention to this issue should be proportionate to the potential for impacts, e.g. careful consideration should be given to mitigation and monitoring where there are important areas for key species such as elasmobranchs” (Environmental report p118).

In light of the lack of knowledge on EMF behavioural effects, the NFFO believe that site selection for wind farms should take into account the location of aggregations of electro-sensitive species. Some of these such as rays form important fisheries which could be affected by the dual impacts to the fish stocks themselves and the displacement effects upon fleet activity. Such areas should therefore be avoided as sites suitable for development.

7. Round 3 Offshore Wind Planning Process

Notwithstanding the limited capacity of the SEA to address the sensitivities of the fishing industry with a degree of precision that would inform windfarm siting decision making effectively, the NFFO is seriously concerned that the recommendations of the SEA could be undermined or ignored in circumstances when the process of offshore leasing of Round 3 zones has commenced before the SEA was completed.

In particular, the recommendations for a coastal 12nm coastal buffer conflicts directly with current zonation proposals on the South Coast and the Bristol Channel. Furthermore, despite representations from NFFO members and constituent bodies about the sensitivities of these zones to fishing communities, no adjustments have yet been made. Copies of these representations are enclosed with this response. A chart detailing the extent of the East Yorkshire crab and lobster pot fishery is also provided as this intersects with western extent of the indicative “Hornsea” R3 zone.

In addition to these specific concerns, the NFFO believes that in principle a process of offshore leasing should take place following the strategic assessment, and running it in parallel is not compatible with good governance in marine spatial planning.

8. Summary

The NFFO comments can be summarised as follows with respect to the SEA as it relates to future leasing of offshore wind farms:

- Effort displacement is particularly important to the inshore fleet which is recognised by the SEA but other factors also affect fleet and fishing port vulnerability to fisheries displacement.
- Displacement can have knock-on environmental implications and impacts to other fishing fleets not directly affected by proposals.
- The SEA has not effectively addressed fisheries sensitivities in a comprehensive manner and this places emphasis upon post SEA planning to address such issues.
- Site level mitigation is no substitute for good siting decision-making that should aim to minimise spatial conflict with the fishing industry.
- As a precautionary measure, siting decisions should aim to avoid the location of important aggregations of electrosensitive fish species until there is more knowledge on the behavioural responses of those species to electromagnetic fields.
- Offshore leasing of Round 3 zones should take full account of the recommendations of the Strategic Environmental Assessment and in principle seabed leasing processes should not take place until strategic assessments are completed.

21st April 2009

National Federation of Fishermen's Organisations
30 Monkgate
York
YO31 7PF

Email: nffo@nffo.org.uk

22 April 2009

Our ref: VC/JB

Your ref:



The Offshore Energy SEA Consultation
Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild St
Aberdeen AB11 6AR

Northminster House
Peterborough
PE1 1UA

T 01733 455305
F 01733 568834

Email: sea.2009@berr.gsi.gov.uk

Head of Environmental Policy Unit

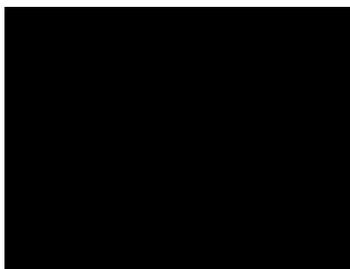
Dear Sir / Madam

UK Offshore Energy SEA Environmental Report consultation (Strategic Environmental Assessment for Offshore Oil and Gas Licensing and Wind Leasing)

Thank you for including Natural England in the above consultation. We attach our detailed response herewith.

Please contact victoria.copley@naturalengland.org.uk (Tel: 01929 557454) if you wish to have any follow up discussions on this response.

Yours faithfully



Rob Cooke
Director Policy

UK Offshore Energy SEA Environmental Report consultation (Strategic Environmental Assessment for Offshore Oil and Gas Licensing and Wind Leasing)

Response from Natural England

Background

Natural England was established under the Natural Environment and Rural Communities Act 2006. It is a non-departmental public body.

Natural England has been charged with the responsibility to ensure that the natural environment including its flora and fauna, land and seascapes, geology and soils are protected and improved.

Natural England purpose as outlined in the Act is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

This response is provided in addition to the submission made by JNCC on behalf of all of the statutory nature conservation bodies and should be read in conjunction with it.

General Comments

We support the Government's commitment to lead with a strategic approach to offshore energy generation. We reiterate our call for a strategic assessment of the environmental impacts of all of the different energy options to determine the optimal energy mix for England at least cost to the natural environment.

Natural England believes that there is an urgent need to develop clean energy supplies in order to mitigate climate change whilst ensuring that the natural environment is not irreversibly damaged by such developments. We emphasise that the environment should not be seen as a barrier to sustainable energy deployment. We are working proactively with the energy industry to identify areas of England where sustainable energy development can proceed in a manner that avoids unacceptable impacts on the natural environment.

Our response to the SEA Environmental Report focuses on the implications of offshore wind energy leasing, as it could be the most significant spatial use of the sea and has not reached the maturity which the oil and gas sector has in the marine environment.

We support the conclusion that in general within territorial waters, there are a greater number of users and sensitive receptors. The uncertainties and information gaps are greatest offshore, so whilst the general move to locate windfarms further offshore to avoid significant impact on inshore areas is welcomed, we believe that this should remain flexible in order to progress those developments within territorial waters where it can be demonstrated that there would not be significant impact. The Report itself states that the environmental sensitivity of coastal areas is not uniform, and in certain cases new offshore wind farm projects may be acceptable closer to the coast. We believe that this does not provide clear enough guidance in identifying areas within which the risks to the environment and uncertainties are lowest (i.e. where development is most likely to be successful), and also to areas where risks and uncertainties are highest whereby developments could encounter many hurdles before consent can be successfully gained.

Appropriate Assessment

The Environmental Report does not consider the requirement for Appropriate Assessment under the Habitats Regulations or the stage(s) in the process from SEA through to Government response to Environmental Impact Assessment of individual developments. We strongly recommend that DECC consider the need for carrying out an Appropriate Assessment at the Government response stage since the Government's response will underpin all future decisions and therefore needs to be compliant with the Habitats Regulations. We believe that an appropriate assessment is likely to be required at this stage and can be carried out with useful results. We advise that an Appropriate Assessment may also be required at the stage in which site leases are offered by the Crown Estate to those development consortia which are successful in tendering for Round 3 and future rounds. We also recognise that many individual development proposals may also require an Appropriate Assessment being carried out by the competent

authority(ies) at the time of application for development consent. Natural England will work closely with those authorities to support and advise this process.

Scope of the SEA and consideration of alternatives

Natural England believes that there is an apparent lack of recognition of the potential role of energy demand and efficiency measures. The Environmental Report refers to energy demand and efficiency, but purely as background information there does not appear to be recognition that the greater the success in demand management / energy efficiency, the less needs to be done in respect of new generation and associated environmental, economic and social costs.

We recommend that the assessment of alternatives should include wider energy efficiency measures and other forms of energy generation and not be restricted to offshore wind and oil and gas. This was raised in our scoping response and we do not consider that this has been addressed in the Environmental Report.

We suggest that the SEA should have considered potential conflicts between energy generation activities, for instance, whether oil and gas licensing should be ruled out in some blocks to provide space for renewable energies to be built.

Evaluation of the effects of gas storage and oil and gas activity

Gas storage is a new industry and has not received much attention in this SEA. Whilst our response focuses on the offshore wind generation aspect we should highlight that issues related to gas storage, including research needs have not been thoroughly flagged and assessed in the consultation document.

Natural England asks for clarification of the status of areas previously ruled out of licensing for oil and gas activities (i.e. in SEAs 1- 7) due to sensitive environmental concerns.

Impacts on coastal and terrestrial infrastructure

While some attention is paid to the impact of connecting to the onshore grid, the report could do considerably more to set out environmental objectives for this aspect of development. We believe the impacts (including cumulative) have been underestimated. Although the Environmental Report describes the potential impacts in general terms, it is not clear whether or how this has been considered within the mapping of spatial constraints.

As raised in our scoping response, it is right and proper that grid connections should be assessed at a strategic level within this SEA and that this should not be left to individual development proposals to tackle in the EIA process. It will not be possible to achieve the target plan of an additional 25GW of generation capacity by 2020 without having taken into account at this strategic level the constraints or otherwise of current and future grid capacity. There are real and serious implications of cable routes under consideration by Round 2 wind projects for sites of European nature conservation importance (see Annex 2). This will only be exacerbated by additional development proposals. This SEA has not sufficiently recognised the importance of assessing the turbines, transmission lines, sub-stations and, to some extent, access roads. The in-combination effects of both onshore and offshore issues, particularly related to wind energy developments have also not been sufficiently addressed.

The report has not highlighted the high proportion of protected and sensitive areas/landscapes in inshore/coastal locations in relation to grid connection. We strongly recommend that the sensitivities of and potential impacts on the natural environment should be an integral part of the consideration of the most suitable sites for transmission and connection with the onshore grid. Whilst the report recognises that significant expenditure is required to update and provide new infrastructure, it should also identify geographic areas where this is a particular issue. We want to avoid the situation in the Wash where decisions on cable routes are being driven by cost, based on where there is existing onshore capacity and environmental considerations are not integral to this process.

Landscape implications of energy development

We agree with the general conclusion that there are multiple sensitive receptors in coastal waters and that the bulk of current proposed development should be sited outside 12 nautical miles in order to reduce conflicts. This would especially protect AONBs, National Parks and Heritage Coasts. However, we believe that this conclusion is not evidence based since work on assessing the sensitivity of different seascape units around the coast has not been completed. As a result, areas within territorial waters which may be less sensitive visually are being potentially excluded from development. Natural England provided significant comment on the requirements for assessing land and seascape impacts in our scoping response which we do not believe has been addressed in the Environmental Report. Therefore the SEA is significantly lacking in this aspect.

Potential Benefits of OWF development

We believe that across Natural England's engagement with energy there is a need to integrate policy goals. We encourage development of win-win outcomes on energy, marine nature conservation, and climate change. The principles which underlie our approach to the identification of a network of marine conservation zones around England support this, wherein stakeholders and decision-makers will be actively involved in planning the network to increase our knowledge of the socio-economic value of areas, maximise potential benefits, facilitate buy-in and decrease conflict and objections to sites. Opportunities for win-wins with biodiversity protection and marine industry needs will be taken where possible and practical.

We therefore support the principle of co-locating Marine Protected Areas with renewable energy generation where the conservation objectives would not be compromised. We are keenly interested in actively engaging in opportunities to test and better understand the possible benefits to the local environment of renewable energy generation.

Evolution of the baseline

We welcome acknowledgement in the report that there will be some new Natura 2000 (N2K) sites at sea to be consulted on during this year. We acknowledge that boundaries of future marine Special Protection Areas and a number of Special Areas of Conservation have yet to be identified and emphasise that we wish to work with DECC to develop Impact Assessments and advice on management in relation to these sites to ensure that both conservation objectives and licensing decisions in and near these sites are robust and based on evidence.

Resource implications of Round 3

Significant resources will be required by the statutory advisors to enable future offshore windfarm development to come to fruition. We request greater clarity on what will be required of us and by when to ensure that we are able to provide quality advice at a strategic level. We emphasise the importance of ensuring that key issues are addressed at the strategic level and early on in the process so that our engagement at a project level is reduced, thereby avoiding uncertainties to developers and investors and delays in the consenting process.

Natural England welcomes the considerable level of work which has been put in to this SEA and previous SEAs which underpin it. We are committed to ensuring that the plan/programme can be implemented in ways which ensure sustainable energy generation in the future and look forward to engaging further in the process.

Further comments on particular aspects of the Environmental Report are provided in the Annex which follows.

Natural England
22 April 2009



ANNEX 1: Detailed comments from Natural England on the Environmental Report

1. Noise

Overall comments

We welcome the importance given by the SEA to marine mammals as a highly sensitive receptor. Piling noise generating high source levels is of potential concern, particularly for large developments with sequential piling. Prolonged seismic surveys are also of concern.

Natural England
John Dower House
Crescent Place
Cheltenham
Gloucestershire
GL50 3RA

T : 01242 533490
F : 01242 584 270

The information and analysis presented with regards to impacts on marine mammals is highly relevant and useful. However, we believe that some of the key questions remain unanswered especially with respect to whether a cumulative dose from several projects simultaneously piling or longer duration offset piling is a greater impact on marine mammals. We also query how a noise dose could be regulated and enforced between development zones given the continually shifting construction timescales and schedules we have experienced in Rounds 1 and 2. Will the operational criteria take into account the impacts from other sectors such as shipping, especially for deeper water areas?

Detailed comments

5.3.2.2 We agree that longer term continuous disturbance effects from operational noise are considered less probable although given that on page 73 it is noted that for larger turbines, narrow tones with clearly defined peaks might considerably exceed background noise levels, and the zone of audibility of these rather discrete frequencies might be much larger than for relatively broadband noise, we query whether this might mean that operational noise has the potential to be more significant for Round 3. Also we note that sound travels further in deep water therefore potential for zones of impact on marine mammals could be greater for future development sites.

5.3.6 We welcome the identification of key areas of marine mammal sensitivity to inform the potential management of noise. However, how these areas will be applied to influence locations and methods of development is not clear from the SEA report.

se dolphin population in the south west of England has not been identified as sensitive.

We believe that further consideration could be given to increasing background noise levels when assessing cumulative noise impacts. P is the dominant noise source at low frequencies in most locations, and its contribution to increased ambient noise levels

2. Physical damage / benthos

It appears that no assessment has been made of potential impacts on cobble or rocky reef Annex I habitats or UK BAP habitats.

3. Birds

Overall comments

We are unclear what is meant by strategic or population level in this context. We do not consider that for many bird species, there is enough information to conclude that collisions and effects are all unlikely to be significant to birds at a population level. Different species have different ecological requirements and need to be assessed separately. This is why Natural England has recommended population viability analyses for several species which may be impacted upon by certain Round 2 projects. The proposed scale of future offshore wind generation is considerably greater than this.

We are surprised that there are no specific recommendations to gather more data or initiate research into particular topics such as modeling displacement or barrier effects and ways in which cumulative effects on birds might be assessed and mitigated.

Whilst we support in general the conclusion that there are more numerous and potentially greater sensitivities in coastal waters, the SEA does acknowledge that there are data gaps further offshore, especially for up to date bird distributions, therefore we are concerned that there could be areas beyond territorial waters which may be more sensitive to windfarm development than areas within where we can have greater confidence in the data available.

Detailed comments

The summarised bird information would appear to be a good synopsis and would be supplemented well by the inclusion of compiled offshore wind monitoring data once the strategic monitoring review being led by CEFAS is complete.

Unfortunately the new boat based data from the SEA gaps analysis, whilst being a good snapshot is a single survey only. It was carried out a time when terns have finished nesting and will have dispersed so feeding aggregations (if present) will have been missed. It was also conducted too late to note moulting auk aggregations (although we note that a significant number were seen around Dogger).

The general seabird distribution at sea data is based on summaries from 1987/95. In view of changes in sea temperature/ fish abundance and distribution, are these likely to have changed? Are the trends still valid? This is acknowledged on pg 197, but no reinterpretation has been attempted.

The only information presented on migratory species is that from SPA counts, so there is no acknowledgement of potential issues with species such as Pink Footed Geese and Whooper Swan for instance. Little or no information is presented on key flyways, though they are mentioned. A synthesis of some of the OWF studies would have been beneficial to the chapter. Some mention is made of mass passerine migration to/from Europe.

Only three of the potential Round 3 zones are covered (Dogger & the zones in the English Channel). The areas due east of Flamborough, off east Anglia, and between Anglesea and the Isle of Man are not covered.

4. Seascape

Overall comments

We support the conclusion that in general within territorial waters, there are a greater number of users and sensitive receptors. However whilst the move to locate windfarms further offshore to avoid significant impact on sensitive landscapes in particular is welcomed, we believe that this should remain flexible in order to progress those developments within territorial waters which would not have a significant impact. We believe that the Environmental Report does not deal well with the implications on seascape/landscape and this is because the environmental baseline concerning landscape/seascape is inadequate and the characterisation work needed to underpin the SEA has not been carried out. The document “*Offshore Energy Strategic Environmental Assessment (SEA) Seascape Study – Identification of Seascape Units around the English coast*

and consideration of sea scape offer one " s ss ss ss s s s ' ' were held before the seascape work commenced.

The SEA appears to be inconsistent in how it has assessed sensitivity and concluded that the bulk of development should be beyond 12 nautical miles. There is a case to argue that for certain especially sensitive coastal landscapes a limit beyond 22km should be applied (as stated in 5.6.1.3).

The potential significant impacts of substations and electricity transmission lines etc. onshore appears to be overlooked. The impact of such features (unless carefully sited) could significantly impact upon the character and characteristics, and the visual qualities of highly valued landscapes/seascapes most especially at the landward edge/coastal strip of the seascape, and within adjacent inland landscape(s). We believe these important secondary, or indirect, effects as well as the effects of the construction phase have not been addressed. The relevance of these matters to the coastal access agenda (ie encouraging people to have access to and appreciation of coastal areas) also needs to be understood and acknowledged.

We are surprised that the recommendations at the end of the Report do not explicitly address issues of relevance to land and seascapes. Our understanding is that these are implied within the recommendation to avoid significant detriment to tourism, recreation and quality of life.

Detailed comments

5.6.6.1 Regional Sea 1. There is no mention of Northumberland Coast AONB here.

5.6.6.2 Regional Sea 2. We note that Spurn Heritage Coast and the North Norfolk Heritage coast are not mentioned. There is also no mention of constructed and consented Round 1 and 2 OWFs.

5.6.6.4 Eastern Channel area. This section has been assessed in a different way to the other regional seas and the concluded impact of low to moderate is not consistent with the comment elsewhere in the document which states that even up to 22km impacts could be at least moderate.

5.6.6.6 Regional Seas 4 & 5. The treatment of AONBs in this section is improved .

5.6.6.7 Regional Sea 6. There is no mention of Solway AONB in this section. Also no mention of existing constructed and consented OWFS? The text mentions cumulative impacts with onshore turbines, but omits other offshore wind turbines?

Cumulative impacts are generally not very well considered within this section.

Page 308 first paragraph - note that the effectiveness of the Round 2 8-13km buffer has not been practically tested. I agree it would have been beneficial to have this before deciding on Round 3 seascape impacts. Please note that Round 1 sites in certain areas have an amplified visual impact than as predicted as part of the EIA process.

Page 308 we note that it is proposed that regional seascape units should be identified and used to assess any potential visual impacts

Page 316 Table Showing Landscape/Seascape assessments for offshore wind farm developments relevant to regional Sea 2 needs updating to include Docking Shoal, Race Bank, Sheringham, Humber and Greater Gabbard.

Page 336 Table showing Landscape/Seascape assessments for Offshore wind farm developments relevant to regional Sea 6 needs updating to include Ormonde

5. Recommendations and Monitoring

Natural England is fully supportive of the wide range of initiatives which are continuously improving our knowledge of receptors and effects (we play an active role in COWRIE for instance). We

encourage continuation of these initiatives and more focused research as we get a better feel for what are the greatest priorities. The Recommendations set out in the Environmental Report include some indications (we would argue incomplete) of when to get more evidence as well as when to take a precautionary approach. It is not clear whose responsibility it is to implement the recommendations and we believe that this section needs to be clearer on which recommendations are the specific responsibility of government, developers, the Crown Estate or a combination of some/all of these or other bodies. Clarity on this would ensure that the relevance and immediacy of some recommendations are not lost.

Recommendation 1 we recommend that decisions taken now for offshore wind and oil and gas minimise sterilization potential for future wave and tidal energy generation in particular.

Recommendation 2 this should include a presumption against developments which result in significant harm to biodiversity and landscape.

Recommendation 3 we support this recommendation but do not consider that the Environmental Report provides developers with sufficient spatial information to avoid areas known to be of key importance to waterbird and marine mammal populations.

Recommendation 4 s s s' s acceptable closer to the coast than 22km. It is also not clear whether the SEA is leaving it to developers to gather the more detailed site specific information or if more information is being gathered by the SEA process (the seascape baseline and sensitivity information for instance is currently work in progress).

Recommendation 5 we fully support this recommendation but feel that the evidence presented in the SEA rather undermines the need to minimise habitat change and promote alternative methods.

Recommendation 9 clarity on who is responsible for the various information gaps and by when these should be filled is needed. We recommend that completion of the seascape characterisation and sensitivity work is included.

Recommendation 14 we support this in principle although the wording is a little unclear. We recommend that further research to understand the spatial and temporal implications of co-locating renewable energy generation with future or existing marine protected areas is added to the list of information gaps in recommendation 9.

Recommendation 15 we welcome the special attention drawn to N2K sites and the recognition s - ' s s s s be placed on the regulatory steps which need to be taken mitigation may not be sufficient or appropriate in some cases.

ANNEX 2: Case study of grid connection issues in the Wash

As part of three proposed windfarms in the Greater Wash Strategic Area, an offshore transmission corridor has been identified that will result in offshore transmission cabling through The Wash. The Wash is ecologically biodiverse and supports numerous ecosystem services and functions for a wide range of habitats and species. This is recognised both nationally and internationally, through its status as a National Nature Reserve, Site of Special Scientific Interest, Special Area of Conservation, Special Protection Area and a Wetland of importance under the Ramsar Convention.

It is the intention of the developer to ensure that activities within the Wash are sustainable and do not result in an adverse effect on the integrity of the site. At the present time this site is relatively undisturbed by major industrial impacts, and unlike other large shallow inlets and bays or estuaries within the U.K., such as the Humber Estuary, it has not been impinged upon by oil and gas pipelines or other subtidal benthic cabling infrastructure (e.g. telecom cables).

Natural England recognises that as part of the Strategic Environmental Assessment carried out for Round 2, suitable areas for offshore wind farm development were identified. The Greater Wash Strategic Area was one of these three Strategic Areas. Eleven developments are proposed within this area. However, Natural England are concerned that the SEA did not adequately address the infrastructure needed to enable offshore wind farm to be developed and identify optimal investments to ensure offshore transmission connections to the national grid that would not disrupt or put at risk key environmental assets.

As a result of limited grid connection options available to the developer, transmission routes through The Wash or across the North Norfolk coast are being put forward. These routes will cross areas of high environmental and ecological value resulting in higher ecological risk than that of a connection at the Skegness substation (the maximum capacity of which will be achieved once the proposed Lynn and Inner Dowsing wind farm is connected). This is a regrettable position, and from the outset it was clear that this would be the best option and would minimise risks to higher value environmental interests.

The potential impacts of the proposed transmission routes through the Wash are set out in full within our responses to the individual Round 2 proposed windfarms. We have advised that there could be significant impact on the *Sabellaria spinulosa* reefs within The Wash and North Norfolk Coast SAC through damage from cabling.

Lincs OWF (consented 21-10-08) is the first of three developments which propose to cable through The Wash. Consent for two export cables which go through The Wash was granted due to mitigation measures which include micro-routing the cables around interest features. The exact route of the Lincs cables has yet to be agreed, but will need to take into account the latest data once a pre-construction survey has been undertaken. The route will also have to consider the draft Inner Dowsing, Race Bank and North Ridge SAC reefs. On its own, and with the mitigation in place, Natural England advised that the Lincs project will not have an adverse effect on the integrity of existing and draft European Marine Sites.

Docking Shoal and Race Bank have applied for consent (in January 2009) for a total of 8 more cables however the adjustments that will need to be made for Lincs project cable route will reduce the total width of the cable corridor identified for the three developments. In addition to this, Eastern Sea Fisheries Joint Committee (ESFJC) has identified an area of historically stable reef within the cable corridor. Natural England is working with ESFJC to protect this area through a *Sabellaria* fisheries byelaw and will advise that other activities with a benthic impact should avoid this area also. It is still possible that, once further benthic surveys have been completed, an

alternative route can be identified to the west of the reef, outside the currently proposed cable corridor.

Norfolk County Council Standards Wind Farm Proposals - Potential Requirements for inclusion in an Environmental Statement / Environmental Impact Assessment

Offshore Wind Proposals

March 2008

Scoping Report – Round 3 Consultation

The officer-level comments below are made without prejudice and as such the County Council reserves the right to make further comments on any potential application that may be brought forward.

I would suggest the following areas ought to be addressed/covered in an Environmental Statement (ES) / Environmental Impact Assessment (EIA) relating to Round 3 schemes:

(a) Landscape

1. Landscape and Visual Assessment Including Impact on Heritage Landscape

For both off-shore and any associated on-shore developments (e.g. work compound, sub-station) the ES/EIA would need to provide:

- An assessment of the impact of the development on the landscape and seascape character, including landscape in neighbouring counties where they fall within the zone of visual influence;
- An assessment of the visual intrusion caused by the development which should include the preparation of a Zone of Visual Intrusion plan/map;
- Photomontages illustrating the impact of the development (See also Grid Connection Issues below);
- An assessment of the cumulative impact of this development taken together with the other (a) operational wind farms, (b) permitted wind farms in the area and (c) development proposals likely to come forward; and
- An assessment of the impact of the development on the heritage landscape.

2. Transport and Landscape Issues

The ES/EIA will need to evaluate the impact on the landscape of upgrading existing roads and creating new access routes in the construction and operational phase of the project (including enhanced signage) as all of this can sub-urbanise a rural landscape. It will also need to consider how these should be mitigated, perhaps through removal and reinstatement at the end of the project. Please also refer to *Highway - Traffic and Access* section.

3. Tourism and Landscape Issues

The ES/EIA will need to address the impact of the wind farm on tourism, including tourism occurring in neighbouring counties, which may be affected if the natural landscape is altered sufficiently.

4. Grid Connection and Landscape Issues

The ES/EIA will need to address whether the existing overhead lines and substation are sufficient to be able to cope with the Wind Farm, or whether there will need to be

any up-grading of any of the existing overhead power lines. The ES/EIA should also address the cumulative impact on the Grid Network arising from any existing or proposed Wind Farms/Wind Turbines in the area.

In the event that new power lines are needed (or existing power lines up-graded) or any other infrastructure needs up-grading (e.g. sub-station) there would need to be a description of the route(s) including plans at an appropriate scale incorporating, for example:

- an assessment of their impact (e.g. photomontages etc).
- details of temporary construction compounds
- identification of any sensitive features along route

The ES/EIA should consider the possibility of putting over head power lines underground in order to minimise their impact.

For further information I would suggest you contact Judith Cantell (Senior Landscape Architect) on 01603 222768. For further information on Heritage Landscape issues, please contact Mike Knights on 01603 222709.

(b) Ecology

The ES/EIA will need to address the potential impact on Ecology, including in particular, impact on the following interests:

- designated sites e.g. Sites of Special Scientific Interest (SSSI), National Nature Reserves, Special Protection Areas (SPA), Special Area for Conservation (SAC), County Wildlife Sites (CWS) etc;
- Coastal and sedimentary processes;
- Marine benthos (wildlife of the seabed);
- Fish resources;
- Marine mammals; and
- Birds.

The need to consider cumulative impact is a requirement of the EIA process. This is of particular importance when considering ecological impacts. Projects to be incorporated in such an assessment must include those in the past, present and foreseeable future. Projects to be incorporated in such an assessment must include not only other potential wind farms but also other types of project taking place in the marine environment or onshore so that all elements of the infrastructure are assessed.

(c) Cultural Heritage and Archaeology

These issues ought to be discussed with Norfolk Landscape Archaeology (Ken Hamilton) 01362 869275.

(d) Socio-economic

It would be helpful if the ES/EIA could provide accurate figures of those likely to be employed both during construction and once the Wind Farm is fully operational. There should also be a statement as to whether the labour would be sourced from local firms or if expertise would need to be imported to the region. In addition the ES

should provide an indication of the likely impact on the local fishing industry particularly when other proposals are taken into account.

(e) Highway – Traffic and Access

The comments below relate to the on-shore works associated with any offshore schemes including: construction of ancillary facilities such as sub-stations; cabling routes; and transporting and servicing of equipment.

1. **Vehicles** – define the nature of the traffic likely to be generated. In addition for the largest vehicles proposed to use each access route(s) this must include: -
 - minimum width (including unhindered horizontal space)
 - vertical clearance
 - axle weight restriction

2. **Access & Access Route** – description of the route (including plans at an appropriate scale incorporating swept-path surveys). Assessment to include site inspection and details of contact with the appropriate Highway Authority (including the Highways Agency for Trunk Roads where applicable). In addition: -
 - details of any staff/traffic movements/access routes;
 - detailed plans of site access/es incorporating sightline provision
 - confirmation of any weight restrictions applicable on the route together with details of contact with the relevant Bridge Engineer
 - overhead/ underground equipment – details of liaison with statutory undertakers - listing statutory undertakers consulted together with a copy of their responses
 - details of any road signs or other street furniture along each route that may need to be temporarily removed/relocated

3. **Impacts during construction** – are any special requirements needed and if so provide details e.g.:-
 - timing of construction works
 - removal of parked vehicles along the route(s) – full details will need to be provided – including whether or not alternative parking arrangements are being offered or bus services provided in lieu of potential loss of ability to use private cars
 - removal and reinstatement of hedgerows – since these are usually in private ownership has contact been made with the owners. Has formal legal agreement been reached or are negotiations pending/ in progress
 - identification of the highway boundary along the construction traffic route together with verification from the Highway Authority
 - confirmation of whether the identified route involves the acquisition of third party land and if so has consent been given, (verbal or has a formal legal agreement been entered into)
 - confirmation of any required third party easements – e.g. will construction vehicles need to overhang ditches (these are usually in private ownership), private hedges or open land adjacent to the highway. If so, details of consent (verbal or a formal written agreement)
 - any modifications required to the alignment of the carriageway or verges/over-runs

- identification of sensitive features along route
 - trimming of overhead trees – has a survey been undertaken to identify trees that will need to be trimmed and if so what steps have been undertaken to identify the owners of those trees
 - confirmation of whether any affected trees are covered by a tree preservation order
 - confirmation of whether any of the verges along the route(s) are classified as SSSI or roadside Nature Reserve status. If so, detail any impact
 - confirmation of any extraordinary maintenance agreement/s required by the Highway Authority
4. **Cabling route/grid connection** – description of the route/s including plans at an appropriate scale, incorporating, for example:
- assessment to include site inspection and details of contact with the appropriate Highway Authority (including the Highways Agency for Trunk Roads where applicable)
 - traffic details of grid connection enabling works
5. **Impacts during operation**
- details of type and frequency of vehicle to be used to service the facility/structure(s) when in operation
 - details of any long-term highway impact e.g. will trees and hedgerows need additional trimming to allow access for service vehicles
 - position of structures relative to public highways and/or public rights of way – the minimum distance of which should be no less than 50m
 - assessment of any impact on adjacent/affected public rights of way e.g. horses and pedestrians – e.g. with a wind farm are the blades positioned in close proximity to bridleways such that flicker may startle horses
6. **Impacts during decommissioning** – define the expected life span of the facility/structure(s).
- provide details of decommissioning works including an assessment of whether or not the structure is to be scrapped - i.e. can it be broken up on site and removed or will it require the same logistical process as initial construction.

For further information on highway related matters I would suggest you contact John Shaw (Senior Engineer) on 01603 223231.

If you have any general queries with any of the above comments please call or Stephen Faulkner (Principal Planner) email on 01603 222752 (stephen.faulkner@norfolk.gov.uk).

Offshore Energy SEA Consultation,
The Department of Energy & Climate
Change,
4th Floor Atholl House,
86-88 Guild Street,
Aberdeen,
AB11 6AR



20th April 2009

Dear Kevin,

RE: DECC Offshore Energy Strategic Environmental Assessment Programme. Consultation on the Environmental Report for Offshore Energy SEA.

Thank you for your letter dated 26th January 2009 regarding the above consultation.

The department welcomes the opportunity to comment on this report. The Northern Ireland Environment Agency's (NIEA) response to your consultation request is set out below.

We are broadly content with this Environmental Report. We believe it has been carried out at a very high standard, well researched and presented.

Our main issue relates to the proposed monitoring of implementing the plan which we found to be unclear (Section 6.2). The section about Effects Monitoring does not detail what is being monitored. In addition we note Section 3.5 includes information about SEA objectives and indicators but we are unsure about the source of information for these indicators. As a final point about monitoring it would be worthwhile knowing if there is any monitoring envisaged which relates directly to the proposed mitigation measures.

In terms of Cultural Heritage we are impressed with the comprehensive annex and associated OES covering the various archaeological aspects of the offshore zone. This summarises the relevant current state of knowledge and opportunities for further research, legal conditions applying in each of the jurisdictions and the range of possible threats to the cultural heritage from development of the offshore seabed.

One further point we believe you should address is the fact that there will be a need to ensure that the regulations listed in respect of combustion emissions from power generation etc are UK wide.

Yours Sincerely,



John Minnis

SEA Co-ordinator

THE NORTHUMBERLAND SEA FISHERIES COMMITTEE

Response to UK Offshore Energy Strategic Environmental Assessment Future Leasing for Offshore Wind Farms and Licensing for Offshore Oil and Gas and Gas Storage Environmental Report January 2009

This response is filed on behalf of this Committee after appropriate consultation particularly with the Committee's Environmental Fishery Officer. We have picked out from the report those themes which are of most relevance to fisheries and we comment accordingly below and this is hopefully helpful.

1. The draft plan/programme subject to this SEA needs to be considered in the context of overall UK energy supply policy and greenhouse gas emission reduction efforts. The main objectives of the current draft plan/programme are to enhance the UK economy, contribute to the achievement of carbon emission reductions and security of energy supply, but without compromising biodiversity and ecosystem function, the interests of nature and heritage conservation, human health, or material assets and other users.

Comment

This is a good overall objective that gives protection to a wide area of concerns that demonstrate that energy production while important is not the overriding issue

2. What are the alternatives to the draft plan/programme – three alternatives are mentioned.

Comment

Option 3 to restrict the areas offered for leasing and licensing temporally or spatially is felt to be the most likely, as is acknowledged later in the report. Other issues will always need to be considered and addressed.

3. Energy consumption from renewable sources

Comment

The UK has considerable potential for offshore renewable energy production. The interests of fisheries need to be properly considered before any development takes place.

4. UK Energy needs met by oil, gas and coal.

Comment

From this Committees involvement with the new proposed coal fired power station at Blyth it is noted that the majority of coal will be resourced from overseas and fisheries interests should be taken account of.

5. What areas are included in this SEA?

Comment

This Committee has understood that placement of wind turbines would only occur in shallower water than mentioned in this part of the consultation. For this reason the coast of Northumberland has been found to be unsuitable for the siting of wind farms. This Committee will need to be consulted therefore on applications which may be made in its district.

6. EU Marine Strategy Framework Directive

Comment

This statement again highlights the issue that energy production is not paramount in decision making.

7. Water depth, distance from areas of high electricity demand, and the availability of connection points to the onshore transmission grid are significant factors in the preferred location of offshore wind developments.

Comment

Assuming that the power station at Blyth is given approval it is relatively unlikely that there would be sufficient justification to sight a wind farm off the Northumberland coast as there would not be demand for more energy production on a local basis.

8. Biodiversity, habitats, flora and fauna - acoustic disturbance by noise

Comment

The Committee has previously raised the issue of spawning sites and is pleased to note that it will be considered again during any SEA.

9. Bird sensitivities

Comment

This statement indicates that siting of wind farms within the Committee's district is unlikely to occur particularly as most of the coast is home to a variety of important species throughout the year.

10. Landscape/seascape

Comment

The siting of wind farms within 12 miles of any sites of national or international importance should be avoided wherever possible.

11. Fishing in the UK has a long history and is of major economic and cultural importance. In 2007, there were nearly 13,000 working fishermen in the UK (of which 79% were full time), operating over 6,700 vessels, many of which were smaller inshore boats. These vessels landed 610,000 tonnes of fin and shellfish in 2007, with a total value of £645 million.

Comment

Extrapolating from the figures quoted for value of fin and shellfish landed, this produces an average of £49,000.00 per fisherman before costs which is felt to be in excess of the average income of local fishermen. This does not detract from the importance of the fishing industry to fishermen, associated businesses and local fishing communities, but incomes tend to be lower in Northumberland and the North East of England than the national average.

12. It is recommended that waters near the coast and certain especially important fishing areas offshore are avoided for future wind farm siting.

Comment

This is an important statement for the current and future fishing industry.

13. Offshore wind farms have the potential to affect civilian aerodromes and radar systems.

Comment

This is felt to be unlikely to affect fisheries matters and see 19 below.

14. A number of offshore European Conservation (Natura 2000) sites are in the process of being designated under the Habitats Directive, and the boundaries of some coastal and marine sites are being extended. In addition, the Marine Strategy Directive through the Marine and Coastal Access Bill will introduce further requirements for identification and designation of Marine Conservation Zones (or Marine Protected Areas). These will require careful consideration in the selection of offshore wind farm sites and oil and gas/gas storage infrastructure to avoid adverse effects on the integrity of the sites or compromising good environmental status.

Comment

These considerations will also apply to coastal and inshore sites so development in or near the European Marine Site in Northumberland are unlikely, which is appropriate.

15. Transboundary effects

Comment

It is noted that displacement of fishing activity has been considered in this report, which is important.

16. The SEA considered the alternatives to the draft plan/programme and the potential environmental implications of the resultant activities in the context of the objectives of the draft plan/programme, the SEA objectives, the existing regulatory and other control mechanisms, the wider policy and environmental protection objectives, the current state of the environment and its likely evolution over time, and existing environmental problems. The conclusion of the SEA is that alternative 3 to the draft plan/programme is the preferred option, with the area offered restricted spatially through the exclusion of certain areas. It is concluded that there are no overriding environmental considerations to prevent the achievement of the offshore oil and gas, gas storage and wind elements of the plan/programme, albeit with a number of mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea.

Comment

This confirms option 3 as preferred and which this Committee would agree with.

17. The requirement for SEA.

Comment

This object is to be welcomed as the main protection is to the environment as a whole.

18. Consultation bodies.

Comment

It is noted that only Governmental organizations are deemed to be consultation bodies in this report, and all other bodies are therefore stakeholders but it is vital that their views are sought where appropriate.

19. Offshore wind farms have the potential to affect civilian aerodromes and radar systems. The UK air traffic control service for aircraft flying in UK airspace has made available mapped data indicating the likelihood of interference from offshore wind turbines on its radar network. Similarly, the Civil Aviation Authority (CAA) produces an Aerodrome Safeguarding Map and Local Planning Authorities are required to consult on relevant Planning Applications which fall within a 15km radius.

Military use of the coasts and seas of the UK is extensive, with all 3 Services having defined Practice and Exercise Areas, some of which are danger areas where live firing and testing may occur. Additionally, several military radars - Air Surveillance and Control Systems (ASACS) - are present around the coasts of the UK; these have been mapped along with corresponding buffers relating to potential conflict with wind farms.

Comment

In particular in Northumberland the position of RAF Boulmer should mean that there should not be wind farms in the vicinity thereof.

Dated: 21 April 2009

From: Chris Bale
Sent: 20 April 2009 19:08
To: SEA.2009@berr.gsi.gov.uk
Subject: Offshore Energy SEA Consultation

FAO Kevin O'Carroll
Head of Environmental Policy Unit
Department of Energy and Climate Change

Dear Kevin

Thank-you for the opportunity to respond to BERR's Offshore Energy SEA Consultation.

Ocean Electric Power (OEP) is a marine renewable energy project development company. Our business model involves identifying suitable sites and then undertaking project design, obtaining all necessary licenses and consents, procuring equipment, raising funding and then managing construction and operation of wave and tidal stream energy farms. We are technology neutral and aim to develop projects utilising both wave and tidal stream resources.

We have identified a number of prospective projects in UK waters and elsewhere. OEP is a participant in The Crown Estate's current marine licensing round in Scotland where the company will be seeking a site for a tidal stream project. OEP has also identified a site off Cornwall for its first offshore wave project.

Our principal contribution to the consultation revolves around the proposed scope of the SEA. As matters currently stand, it is not possible to conceive of a commercial wave energy farm outside of Scottish waters due to the capacity limitations imposed by The Crown Estate on any project in England where there is no SEA. Unfortunately, a number of the necessary conditions for commercial offshore wave energy projects cannot presently be fulfilled in Scotland. The 10MW ceiling on site licenses applied by The Crown Estate in English waters, coupled with the 'development' categorisation has the effect of rendering projects uneconomic and unsuited for investment. Such a situation risks damaging the progress of the marine energy sector in the UK. It is inhibiting the creation of a market for the technology that is being designed by the device developers. Without a market being created by companies such as OEP, device developers will struggle to obtain investment for their activities. There is also a real risk that a delay in completing SEAs in suitable areas in the UK will lead to companies such as OEP focusing effort elsewhere.

OEP would therefore wish to see the scope of the SEA extended to include marine renewable energy in areas in England that have the potential for early development. These would include the South West of England and the Western Approaches. We would be very happy to suggest specific areas for marine energy SEAs.

Best regards

Chris Bale

Chris Bale | Chief Executive | Ocean Electric Power

Ocean Electric Power
Tamar Science Park
Davy Road
Derriford
Plymouth
PL6 8BX

Tel: +44 (0) 1666 847017

www.oceanelectricpower.co.uk

Disclaimer Notice

This message and any attachments are confidential and should only be read by those to whom they are addressed. If you are not the intended recipient, please contact us, delete the message from your computer and destroy any copies. Any distribution or copying without our prior permission is prohibited. Internet communications are not always secure and therefore Ocean Electric Power does not accept legal responsibility for this message. The recipient is responsible for verifying its authenticity before acting on the contents. Any views or opinions presented are solely those of the author and do not necessarily represent those of Ocean Electric Power.

From: Donners, Maurice
Sent: 06 March 2009 15:07
To: sea.2009@berr.gsi.gov.uk
Subject: Offshore Energy SEA Consultation
Attachments: PCIC_Europe_Paper 535.doc; _1 Poot 2008 Green Light for Nocturnally Migrating Birds.pdf

Dear Madam, Sir,

As a reaction to your Environmental Report of DECC's Strategic Environmental Assessment (SEA) of a draft plan/programme to enable licensing for offshore activities related to energy, I'd like to draw your attention to the possible risks which the lighting of offshore activities can pose to migrating birds. One of the possible prevention measures is the use of light sources with an adapted light spectrum which is less disturbing to the migrating birds.

You can find more information in several published papers and reports. For your convenience I've attached the most important ones to this e-mail.

In a few weeks time, a research report from the dutch ecological consultancy firm Altenburg and Wybenga will be published, stating that for the Wadden Sea, 52 bird species are put at serious risk by the effects of offshore platform lighting.

vriendelijke groeten, best regards,

Maurice

dr.ir. M.A.H. Donners
Project Leader / Segment Team Leader Outdoor, Advanced Development Lighting

Mathildelaan 1, 5611 BD Eindhoven, The Netherlands

Simply Switch to printing double-sided and printing less

The information contained in this message may be confidential and legally protected under applicable law. The message is intended solely for the addressee(s). If you are not the intended recipient, you are hereby notified that any use, forwarding, dissemination, or reproduction of this message is strictly prohibited and may be unlawful. If you are not the intended recipient, please contact the sender by return e-mail and destroy all copies of the original message.

ADAPTING THE SPECTRAL COMPOSITION OF ARTIFICIAL LIGHTING TO SAFEGUARD THE ENVIRONMENT

Joop Marquenie NAM	Maurice Donners Philips Lighting	Hanneke Poot Max-Planck Institute for Ornithology	Willy Steckel Coopers Crouse Hinds GmbH	Bas de Wit NAM
Schepersmaat 2 9405 TA Assen	Mathildelaan 1 5611 BD Eindhoven	Postfach 1564 D-82305 Starnberg/Seewiesen	Senator Schwartz Ring 26 D-59494 Soest	Schepersmaat 2 9405 TA Assen
The Netherlands	The Netherlands	Germany	Germany	The Netherlands

Abstract - Over 60 million birds, of many species, cross the North Sea each year, twice. Light has a significant impact on migratory birds at sea, as it can attract and trap birds at large illuminated structures, such as off shore platforms. We first studied the behaviour of birds around offshore platforms and secondly tested the effect of the presence of lighting, the intensity and type of lights and the light colour on bird behaviour. As a conclusion, about 10% of the North Sea migrating bird populations are impacted by offshore installations. We developed a light spectrum that can be applied off shore, offering safety to both humans and birds. A field demonstration test, involving the exchange of lights to the new colour on a gas production platform has demonstrated a reduction of bird reaction of at least 50 to 90 %. Finally, the compliance to explosion safety requirements has been demonstrated. It is expected that the bird-friendly lighting will become the new standard for any installation situated in areas with bird migration.

Index Terms — Migrating birds, lighting, off shore platforms, fatal light attraction, ecology.

I. INTRODUCTION

The North Sea is an important migration route for a large number of bird species (songbirds, waders, birds of prey and other bird species). Over 50 million birds may cross the North Sea each year twice, with peaks in spring and autumn. Appendix 1 gives an overview of migration intensity and direction above the North Sea in different months. This route is normally indicated as the Atlantic flyway. Several more of such flyways exist around the globe.

At the same time, these bird populations are worldwide under pressure. Their environment is subject to rapid change by multiple factors (land-use, climate change, exploitation of natural resources, etc.). In order to protect endangered and vulnerable species and to enhance resilience of the ecosystems, measures are taken worldwide. For EU countries this results in the further implementation of the habitats and Bird directives, developing environmental legislation and the creation of a network of interconnected protected areas (Natura2000). This recently also includes the North Sea. Several international treaties have been signed to protect migratory species including the Migratory Bird Treaty Act (US) and the African-Eurasian Migratory Waterbird Agreement (Lenten, B. 2006).

The investigations were initiated because of observations that large flocks of migratory birds occasionally may enter flares. It was found, however, that also without flaring, large flocks of birds accumulated

around illuminated installations at open sea at night. The reason was not fully understood, but it was estimated that North Sea wide, about 10% of the migrating bird population (6 million birds) could be significantly affected (delay, wasting energy resources, exhaustion, enhanced predation, etc.) by the installations. The impact could worldwide even be magnitudes greater.

In the period 1992-2002 we experimentally proved that artificial light was the reason that these birds accumulated and what were the conditions that triggered this behaviour. In the following period we revealed that only a part of the spectral light was responsible for the bird's reactions.

Finally we developed and tested a spectrum for different light sources as are mostly used offshore that is electrically safe, allows safe and comfortable working conditions and does no longer disorient birds.

Our paper will cover three major topics:

- 1) Migration in the ecology of birds and the response to artificial lighting;
- 2) The development of light sources for safe working, while being bird-friendly;
- 3) The electric safety of replacement light sources.

II. MIGRATION IN THE ECOLOGY OF BIRDS AND THEIR REACTION TO ARTIFICIAL LIGHTING

Many bird species migrate long distances. The most common pattern involves flying north to breed in the temperate or Arctic summer and returning to wintering grounds in warmer regions in the south.

There are many reasons to migrate. One reason is to avoid predation, other reasons involve essential food reserves and the longer day length. The longer days of the northern summer provide greater opportunities for breeding birds to feed their young. Most species developed their own optimum for migrating, most go north as soon as possible, some return immediately after the first clutch, some stay till the bitter end of season. Species that breed extremely north, like many wader birds, have a very limited window. If they come to early, there might still be snow, if they come too late, their offspring might not make it.

Migration is often concentrated along well established routes known as flyways. These routes typically follow mountain ranges or coastlines, and may take advantage of updrafts and other wind patterns or avoid geographical barriers such as large stretches of open water. Much information about flyways can be found in a recent series of web publications: www.jncc.gov.uk/worldwaterbirds. The altitude at which birds fly during migration varies. Most bird migration is in the range of 150 m (500 ft) to 600 m (2000 ft), but occasionally up to 6 km (20.000 ft) to cross mountain ridges. Bird hit records from the US show

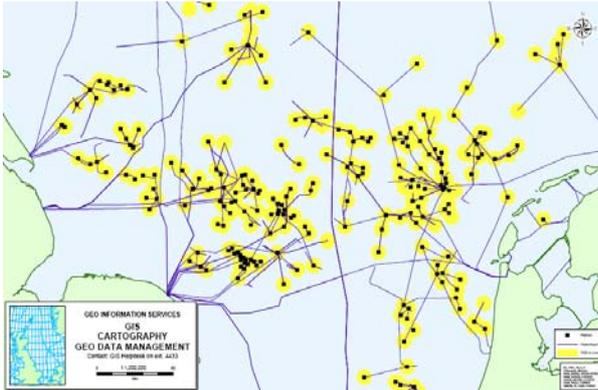


Fig. 1 Map of the southern section of the North Sea with existing production platforms (2007). Also indicated the potential impact zone of 5 km (in yellow)

most collisions below 600 m (2000 ft) and almost none above 1800 m (6000 ft).

Reactions to artificial lights are known for a long time. Clarke (1912) was the first to record the impacts of lighthouses in his extensive studies on bird migration. Many bird watchers became obsessed by the phenomenon of large flocks of birds circling around lighthouses in incredible high concentrations and species diversity, often resulting in the death of many. The “problem” was solved, by applying floodlights around the lighthouse, enabling the birds to orient themselves on the surroundings. Marquenie and Van der Laar (2004) identified the same phenomenon around gas and oil production installations at sea. Their systematic approach led to the conclusion that the majority is song and wader birds and that the milling behaviour around platforms only occurs during cloudy or foggy nights during the broad front migration. In addition, the milling in high concentrations of birds only occurred between midnight and dawn.

The role of the platform lighting was assessed by turning lights off and on and sequential testing groups of lighting. A typical outcome for the on-off experiment is shown in table 1 and for the impact of different groups of lighting in table 2.

TABLE I
TYPICAL REACTION RATE OF BIRDS TO LIGHT AT SEA
DURING CLOUDY NIGHT MIGRATION (ALL LIGHTS ON,
INCLUDING MAIN DECK LIGHTS; 30 kWh)

Time in minutes after light-on	Number of birds
7	200-250
12	1000
20	1500
25	2000
30	4000-5000
Time in minutes after lights off	
3	Significant decrease
15	Gone

The results prove that the artificial lighting is responsible for the disorientation of birds during periods of cloudy skies. They also prove that the response is dose related: the more light, the stronger the effect. Upward directed TL floodlights have an increased effect as well as the sodium flood lights of the cranes. The impact was estimated to reach between 3 and 5 km. Maximum lighting (TL and Sodium floodlight) gives the strongest impact. The

estimated residence time of bird flocks is about 20 minutes, but some solitary and therefore specific recognisable birds (like a solitary Woodcock, etc) have been observed to circle for several hours.

From an analysis of the spatial distribution of platforms in the southern North Sea (Fig. 1) in relation to migration routes, the reach of the impact and the frequency of cloudy conditions during periods of migration, it was concluded that about 10% (6 million birds) of the migrating population is impacted every year.

The solution to switch off lights appeared not workable due to costs of redesign of the electrical scheme and costs of installation. Moreover, light is essential for safety reasons.

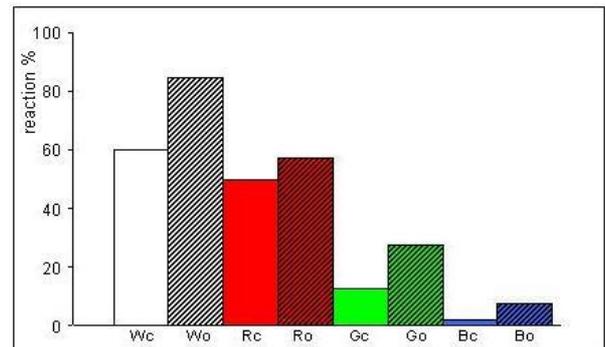


Fig. 2 Bird responses to different light conditions: white (W), red (R), green (G) and blue (B) under clear (c) and overcast (o) conditions.

III. BIRD FRIENDLY LIGHT SOURCES FOR SAFE WORKING CONDITIONS

Eager to find a solution, a novel experimental approach was chosen and the sensitivity of birds in field conditions was tested towards primary colours blue, green and red, and a “white” spectrum. The experiments were performed using a HPI 1000 W light source directed to the sea in a nature conservation area at 10 km distance from the nearest light point. The spectrum was manipulated with filters and the response parameter was change of original flight direction of migrating birds coming freshly from sea. Bird’s reactions were registered as solitary birds or as groups. The results are shown in figure 2. This shows a clear trend of increasing bird’s reaction going from red to green, blue, to white light. The reaction under cloudy conditions also proved to be stronger as under clear skies.

This outcome led to the hypothesis that the reaction of birds to change flight direction is mainly due to the red component in the spectrum. This red part of the spectrum, is known to interact with the bird’s internal compass (Wiltschko, W., Munro, U., Ford, H. & Wiltschko, 1993). This also explains the observations during the previous 10 years that birds only reacted during overcast nights or fog and disappeared at the onset of dawn or breaking of clouds, whereas moonlight did not make a difference. We speculated that lighting in general attracts birds, but the reason for accumulation and circling around is loss of direction due to a disturbance of their compass by red light.

To put this result in practice, a number of other factors had to be taken into account. A light source without any red light would not be acceptable from safety considerations, as any colour, which is not present in the

available light will not be visible. A certain minimum level of red is therefore necessary for a sufficient visibility of important safety equipment such as fire extinguishers and emergency buttons and safety signs.

To ensure that helicopter pilots can locate the helicopter deck easily, a new standard for helicopter deck lighting is being put in place, defining the perimeter lighting to be green and excluding the use of green lighting on other parts of the platform. The ICAO definition of green is shown in figure 3.

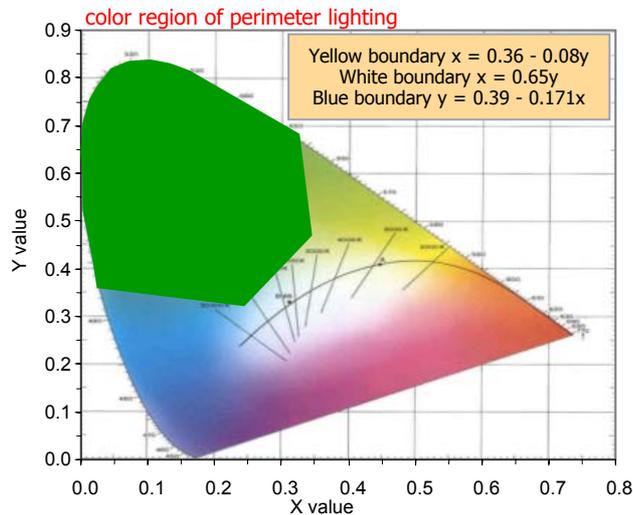


Fig. 3 x,y CIE colour triangle, showing ICAO definition of green.



Fig. 4. Off shore platform equipped with low-red exterior lighting.

The following two years, similar tests were performed during autumn migration, now using specially developed lamps with adapted spectra. A detailed analysis of all data, has shown that the best description of the relation between the spectrum and the bird reaction is given by the parameter B which we defined as the fraction of the light (radiation with a wavelength between 380 and 780 nm) which has a wavelength between 575 and 650 nm:

$$B = \frac{\int_{575}^{650} E(\lambda) d\lambda}{\int_{380}^{780} E(\lambda) d\lambda} \quad (1)$$

The correlation of the bird reaction to this parameter is shown in figure 5. This has been the basis for our further lamp development.

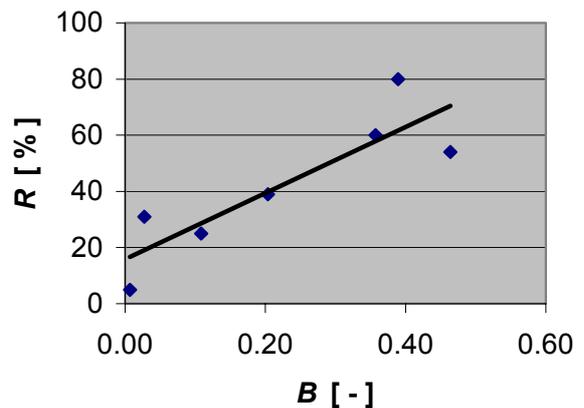


Fig. 5 Reaction percentage, R , versus parameter, B , for seven tested spectra.

In order to confirm that a light source as this would not disorient birds when used at a large scale, a test was needed offshore. To ensure safe working conditions, perception and functional tests were first done at on shore test facilities under the guidance of lighting application specialists. These tests were performed both with off shore personnel and randomly selected members of the public and showed that safety was indeed guaranteed. The new light was applied on an off shore platform 20 km north of the Dutch island of Vlieland. In May 2007 almost all of the exterior 400 TL and 20 floodlights were replaced with lamps with the new spectrum. A photo of the platform is shown in figure 4.

Autumn 2007 the reaction of birds off shore was assessed following the techniques that were applied during the offshore inventory phase. The observations were compared with observations in previous years, taking into account the weather conditions and aligning with bird intensive counts all along the shore. The results are shown in table 3.

It was concluded that the period of observation fell with in the top of the period of migration (based on coastal bird counts and radar observations) and that the circumstances for disorientation were optimum (cloudy weather). Taking this into account, the disturbance of birds declined with 50-90%. It has to be noted that at the time of this test not all white lamps had been replaced. Much of the remaining bird reactions were concentrated around the remaining white lamps. Therefore, the total effect is assumed to be even more positive.

**TABLE 2
INFLUENCE OF BRIGHTNESS AND LAMP TYPES ON BIRDS**

Intensity of light	Number of birds	Remarks
Beacon and obstruction lights (300 W)	None	This level of brightness is inconsequential
Light in crane (1500 W)	Small number	Bright lights shining outward, albeit to a limited extent, has some influence on birds
Light in crane, beacon and obstruction lights (160 W) and beacon and obstruction lights	Limited numbers	Lights in a place clearly visible to birds has a marked, but limited influence
All lights on the helicopter landing platform (incl. landing lights: 480 W)	Numbers clearly increase	Quite a lot of light in a place conspicuous to birds has quite a considerable influence
All lights switched on (30 kWh)	During intensive migration, large to very large numbers	Standard lighting of a location has a marked, considerable and prolonged influence

**TABLE 3
RESULTS OF THERMAL MEASUREMENTS FOR /840 AND LOW-RED LAMP TYPES**



Lamp type	driver				lamp		reflector		protective bowl			enclosure
	above L3	above L3 in furrow	at side of L3	above L22	near filament No. 1	No. 2	under lamp 1 near filaments	under lamp 2 near driver	above the filaments lamp 1	lamp 2	above lamp 2 near driver	above driver
/840	57	62	66	57	69	67	53	64	34	33	37	41
Low-red	57	61	66	56	70	68	52	64	34	34	37	41

**TABLE 4
RESULTS OF ELECTRICAL MEASUREMENTS FOR /840 AND LOW-RED LAMP TYPES**

Lamp type	main			lamp 1			lamp 2			total power
	I [mA]	P [W]	cos φ	I [mA]	P [W]	U [V]	I [mA]	P [W]	U [V]	Dissipation [W]
/840	285	62.5	0.95	300	27.8	93.2	288	27.4	95.8	7.3
Low red	287	63.1	0.96	299	28.2	94.9	287	27.6	96.5	7.3

IV. ELECTRIC SAFETY OF RETROFIT TL LAMPS

The process area lighting of the relamped platform is in majority of a double bi-pin TL type. All the production / process areas are classified zone 1 and zone 2 for explosion protection, meaning all lighting equipment is certified for use in these areas. However for standardization reasons the luminaries are all EX"e" (zone 1 luminaries). Replacement of the platform luminaries, to conduct the test, was not seen as an option. Replacement of the "white lighting tubes" by "bird-friendly" ones was the most efficient way to do the testing. The light output of the tubes is 16% lower as the normal 36W/840 tubes. It is remarked however that this not resulted in an increase of safety risk, as the perceived brightness is higher due to the higher colour temperature of this light.

The installation owner is responsible to operate the lighting within the certification boundaries. A risk assessment on the new lighting was done by the manufacturer of the luminaries by assessing the influence of the "bird-friendly" tubes on the existing lighting certification. The impact investigation of the lamp change

with respect to Ex requirements was done by the luminaries' original manufacturer. The first luminary, with an electronic ballast, used for the investigation was manufactured after 2003. The luminary, 2x36W, was rated for a voltage range of 110 V to 254 V and a frequency range of 50 Hz to 60 Hz. The working temperature range is from -20° C and 70°C.

Compared were the Master TLD 36/840 lamp with the same lamp type but with a new phosphor composition producing the new light color.

On request of the installation owner two additional luminaries were tested too, an older one of the same manufacturer (manufactured in the nineties) and a luminary of another manufacturer.

Test results of the first test are given in attachment x (number to be given). The test results of the additional test were equal to the ones of the first test.

The test program consisted of:

- 1) Temperature measurement with both types of tubes at normal ambient temperature,
- 2) Electrical measurements (voltage, current) including signal analysis at the tubes,

- 3) Light output measurement with both types of tubes.

The executed measurements on the fixture show nearly the same results for the "white" tubes as well as for the new "low-red" tubes.

"Nearly" means that the results of the thermal and electrical measurements are within the estimated variances of different tubes of the standard "white" tubes.

Based on these results and the fact that the structural design of the "white light" and "low red" lamps are identical the "low-red" fluorescent lamps could be used for replacement of "white light" lamps in installed luminaries in hazardous areas. This statement is to our opinion valid for luminaries with electronic ballasts of different make and type. However it is advised to check this with the original manufacturer of the luminaries in use.

CONCLUSION

Lighting is the main factor in attracting migrating birds to off shore platforms. In many cases, lighting is needed to give safe working conditions. A new light colour has been designed which can reduce the distraction of migrating birds with a factor of up to 90 %. In separate experiments, the safety of these new lamps with respect to human working conditions and explosion safety has been demonstrated.

NOMENCLATURE

- B Bird parameter (-).
- I Current (A).
- P Power (W).
- R Reaction percentage (%).
- U Voltage (V).

REFERENCES

- [1] Boere, G.C. & Stroud, D.A. 2006. The flyway concept: what it is and what it isn't. Waterbirds around the world. Eds. G.C. Boere, C.A. Galbraith & D.A. Stroud. The Stationery Office, Edinburgh, UK. pp. 40-47.
- [2] Lenten, B. 2006. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds. Waterbirds around the world. Eds. G.C. Boere, C.A. Galbraith & D.A. Stroud. The Stationery Office, Edinburgh, UK. pp. 350-353.
- [3] Clarke, W.E. 1912. Studies in bird migration. Gurney and Jackson, London.
- [4] Marquenie, J. M. & F. Van de Laar, 2004. Protecting migrating birds from offshore production. Shell E&P Newsletter, January 2004.
- [5] Wiltschko, W., Munro, U., Ford, H. & Wiltschko, R. Red light disrupts magnetic orientation of migratory birds. Nature 364, 525-527 (1993)

VITA

Maurice Donners is working on the relation of animals and lighting and outdoor lighting in general with Philips Lighting in Eindhoven, The Netherlands.

Joop Marquenie is an environmental and ecology specialist of the Dutch oil and gas company NAM.

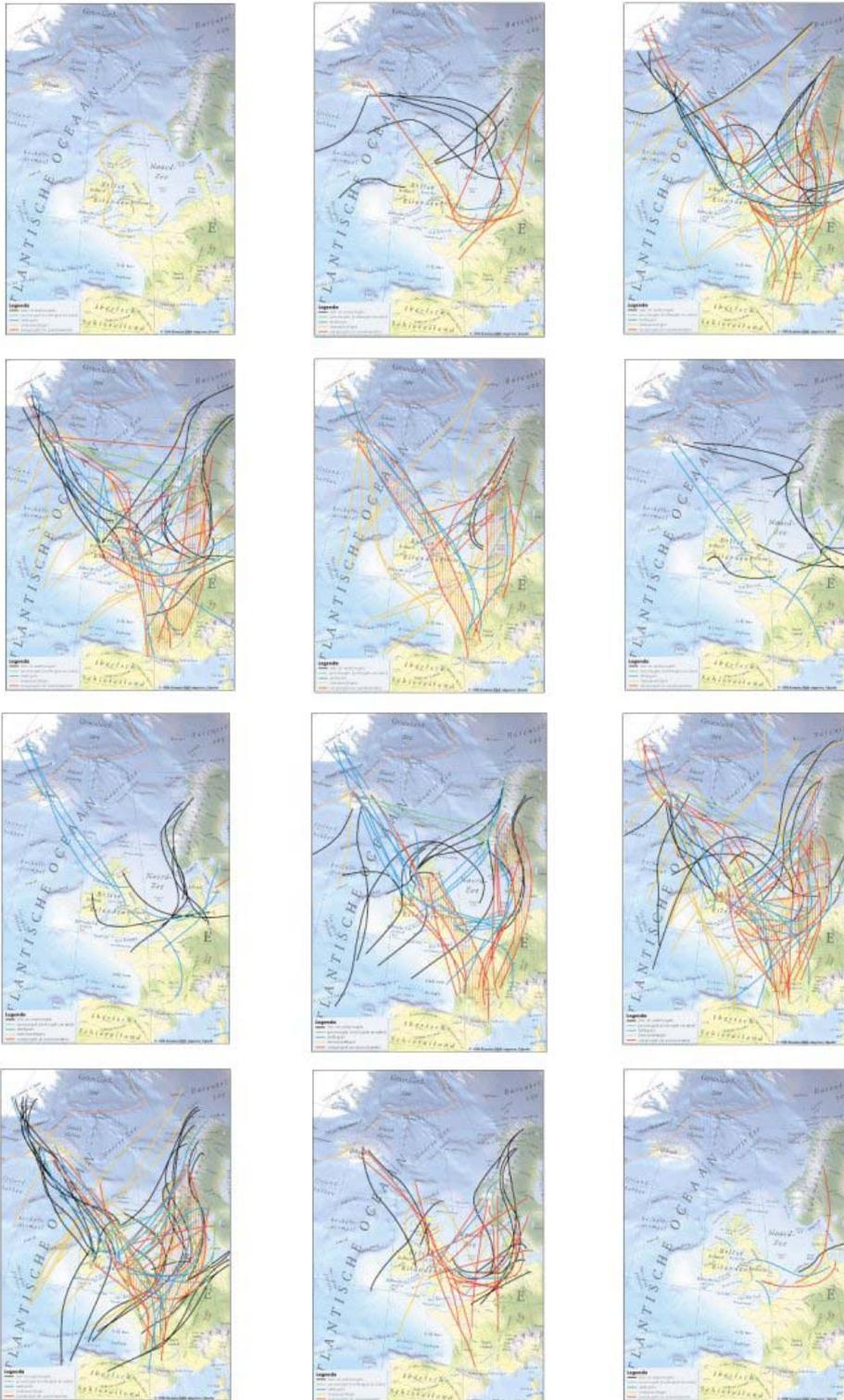
Hanneke Poot did her MSc and a number of subsequent projects on the influence of light colours on distraction of migrating birds. She is currently at the Max Planck Institute of Ornithology at Seewiese.

Willy Steckel is product line manager lighting with Cooper Crouse Hinds.

Bas de Wit is a senior electrical engineer of the NAM.

Appendix

Migration intensity and direction in different months (January through December) above the North Sea. In spring species migrate to northerly breeding grounds.



Legenda

Black	=	Sea birds
Green	=	Birds of prey
Red	=	Songbirds
Bleu	=	Waders
Yellow	=	Gulls

Research

Green Light for Nocturnally Migrating Birds

*Hanneke Poot*¹, *Bruno J. Ens*², *Han de Vries*³, *Maurice A. H. Donners*⁴, *Marcel R. Wernand*⁵, and *Joop M. Marquenie*⁶

ABSTRACT. The nighttime sky is increasingly illuminated by artificial light sources. Although this ecological light pollution is damaging ecosystems throughout the world, the topic has received relatively little attention. Many nocturnally migrating birds die or lose a large amount of their energy reserves during migration as a result of encountering artificial light sources. This happens, for instance, in the North Sea, where large numbers of nocturnally migrating birds are attracted to the many offshore platforms. Our aim is to develop bird-friendly artificial lighting that meets human demands for safety but does not attract and disorient birds. Our current working hypothesis is that artificial light interferes with the magnetic compass of the birds, one of several orientation mechanisms and especially important during overcast nights. Laboratory experiments have shown the magnetic compass to be wavelength dependent: migratory birds require light from the blue-green part of the spectrum for magnetic compass orientation, whereas red light (visible long-wavelength) disrupts magnetic orientation. We designed a field study to test if and how changing light color influenced migrating birds under field conditions. We found that nocturnally migrating birds were disoriented and attracted by red and white light (containing visible long-wavelength radiation), whereas they were clearly less disoriented by blue and green light (containing less or no visible long-wavelength radiation). This was especially the case on overcast nights. Our results clearly open perspective for the development of bird-friendly artificial lighting by manipulating wavelength characteristics. Preliminary results with an experimentally developed bird-friendly light source on an offshore platform are promising. What needs to be investigated is the impact of bird-friendly light on other organisms than birds.

Key Words: *artificial light; bird-friendly lighting; ecological light pollution; light color; magnetic compass; nocturnally migrating birds; orientation*

INTRODUCTION

For millions of years, plants and animals evolved under a day–night cycle, where the bright light of the sun during the day was replaced at night by weak light from the stars and sunlight reflected off the moon and planets. This situation ended very recently when humans started to artificially light the nighttime sky, which is especially clear in wealthy industrialized areas (Cinzano et al. 2001). Because animals (including man) and plants did not evolve under these artificial conditions, nighttime lighting may have serious negative consequences for the ecosystem, which made Longcore and Rich (2004) coin the term “ecological light pollution,” after Verheijen (1985) had coined the term “photopollution”

in 1985. According to Rich and Longcore (2006), the vast majority of conservation studies have focused on the daytime. As a result, we are just starting to appreciate the magnitude of the ecological consequences of artificial night lighting.

Artificial night lighting affects the natural behavior of many animal species. It can disturb development, activity patterns, and hormone-regulated processes, such as the internal clock mechanism; see references in Rich and Longcore (2006). Probably the best-known effect, however, is that many species are attracted to, and disoriented by, sources of artificial light, a phenomenon called positive phototaxis. Apart from insects, birds that migrate during the night are especially affected (Verheijen 1958). This

¹Max Planck Institute for Ornithology, ²SOVON Dutch Centre for Field Ornithology, ³Utrecht University, ⁴Philips Lighting, ⁵Royal Netherlands Institute for Sea Research, ⁶Shell EP Europe (NAM B.V.)

may cause direct mortality, or may have indirect negative effects through the depletion of their energy reserves. Reviewing the literature, Gauthreaux and Belser (2006) conclude that “all evidence indicates that the increasing use of artificial light at night is having an adverse effect on populations of birds, particularly those that typically migrate at night.”

The reason why migrating birds are attracted toward artificially lit structures remains obscure. Gauthreaux and Belser (2006) discuss several hypotheses, including the possibility that artificial lighting interferes with the magnetic compass. It is assumed that migrating birds use visual cues (Emlen 1967, Evans Ogden 1996, Åkesson and Bäckman 1999, Mouritsen and Larsen 2001) as well as a magnetic compass mechanism (Wiltschko and Merkel 1966, Emlen et al. 1976, Wiltschko and Wiltschko 1995a, Deutschlander et al. 1999, Wiltschko and Wiltschko 2003) for orientation. It is clear that light is an important factor in using visual cues, but the second mechanism involves light as well. Magnetic orientation is probably based on specific light receptors in the eye and shown not only to be light dependent (Ritz et al. 2000), but also wavelength dependent: migratory birds require light from the blue-green part of the spectrum for magnetic compass orientation (Wiltschko and Wiltschko 1995b, 2001, Muheim et al. 2002) whereas red light, the long-wavelength component of light, disrupts magnetic orientation at least in laboratory conditions (Wiltschko et al. 1993). During overcast nights, the birds cannot use celestial cues and may be more dependent on the magnetic compass for orientation. In line with the hypothesis that artificial night lighting interferes with the magnetic compass, it is well established that during overcast nights, birds are more affected by artificial lights than on clear nights (Cochran and Graber 1958, Herbert 1970, Avery et al. 1977, Evans Ogden 1996, Wiese et al. 2001, Evans Ogden 2002). Resident birds are less affected, or even unaffected as they get accustomed to the presence of artificial light, do not use magnetic compass orientation, or lack this mechanism altogether (Mouritsen et al. 2005).

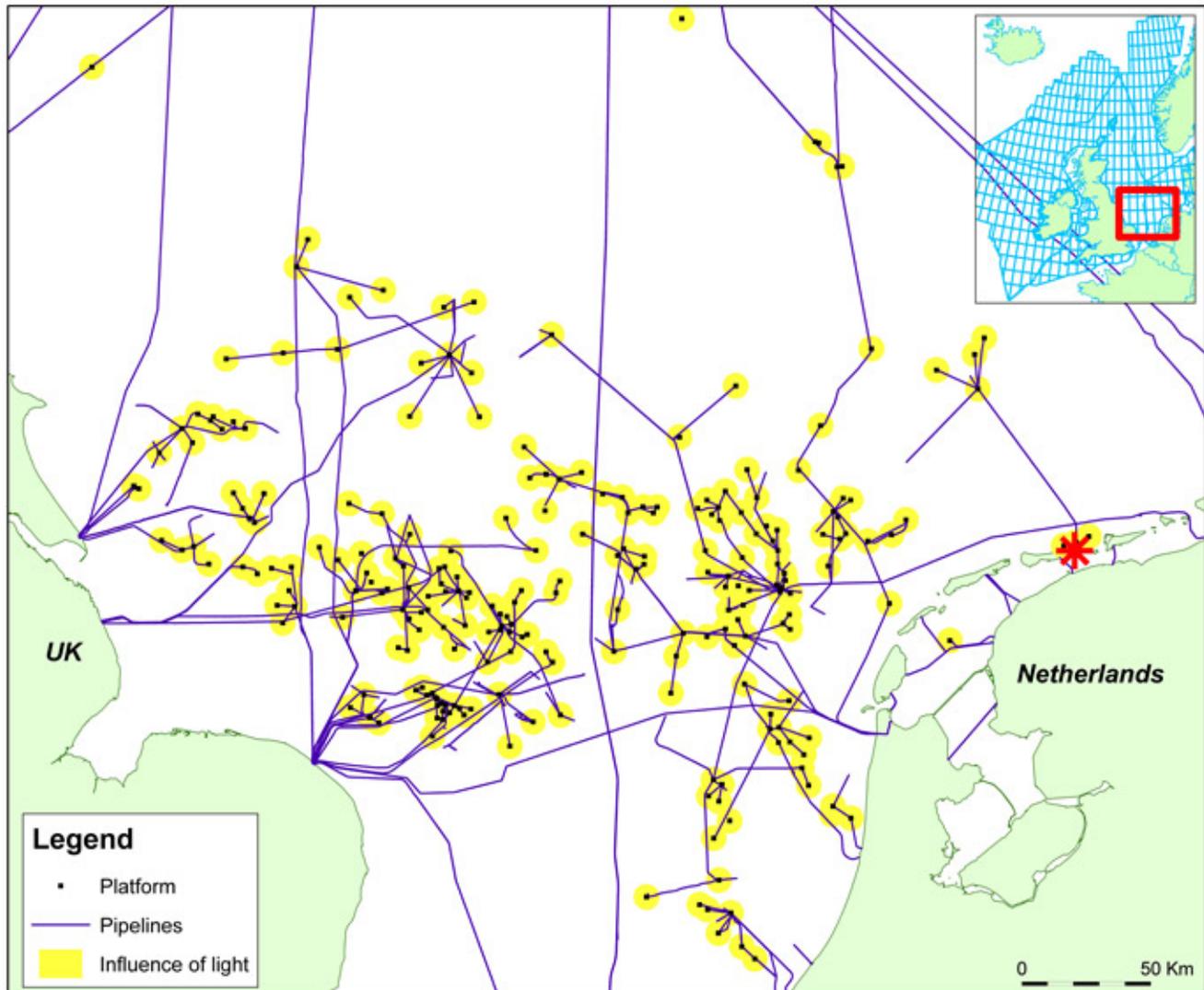
Irrespective of the precise mechanism, it is clear that artificial lights may interfere with the birds' ability to orient themselves (Evans Ogden 1996). Nocturnal bird kills occur wherever a lit obstacle, such as a tall building, lighthouse, or offshore installation, extends into an air space where birds are flying

(Verheijen 1958, 1985, Evans Ogden 1996, Wiese et al. 2001, Evans Ogden 2002). Globally, hundreds of millions of migrating birds are affected by the presence of artificial light on a yearly basis, many of which do not survive the encounter. The potential consequences can be excessive for sea areas with a high density of offshore installations. For the southern North Sea, for instance, it is impossible for a bird to cross without encountering two to ten installations (Fig. 1). Millions of seabirds, waterbirds, raptors, owls, shorebirds, gulls, terns, and songbirds pass through this area on their migrations back and forth between their breeding areas and wintering areas (Fig. 2). What can be done to minimize the losses among these migrants caused by the many offshore installations?

In an unpublished study, Marquenie and van de Laar (2004) investigated the behavior of migrating birds around offshore installations in the southern North Sea in the period 1992–2002. They observed that the milling behavior of dense—often mixed species—flocks only occurs during overcast nights (>80% cloud cover) and is most concentrated between midnight and dawn. In order to prove the cause-effect relation of lighting of offshore installations, they performed several experiments during two nights in November 2000 in which they manipulated the lighting of a gas-production platform (gas-production platform L5, situated 70 km offshore of the Dutch coast). When the lights were switched on, the number of birds on and around the platform quickly increased and when the lights were switched off, the birds rapidly dispersed from the platform, showing that it was indeed the artificial lighting that attracted the birds. A typical example is given in Table 1. In a second experiment on the same platform, they assessed the impact of partial lighting. It was shown that the influence of lighting increases with power (i.e., light intensity) and skyward-directed position (Table 2). It was estimated that the influence of full lighting (30 kW) extends to 3–5 km.

The easiest solution to this problem, turning off the lights (Evans Ogden 1996, Marquenie and van de Laar 2004), is not feasible for most offshore installations because of safety requirements or technical design. Many offshore installations in the North Sea and elsewhere are developed without the capability to switch off lights because this is regarded as undesirable because of explosion and corrosion risks. Retrofitting offshore installations also proved to be extremely expensive. Apart from

Fig. 1. Map of the southern section of the North Sea with existing production platforms in 2007. For each production platform, the potential impact zone of 5 km is indicated in yellow. The inset indicates where this area is located in the southern part of the North Sea. The red star indicates our study area.



redrawing the platform electrical scheme, it requires explosion-proof switches, installing switch wires, and temporarily taking the platform out of production.

A promising alternative would be to change light color, as laboratory studies show that birds are only disoriented under specific wavelength conditions (Wiltshcko and Wiltshcko 1995b, 1999, 2001,

Muheim et al. 2002). This idea dates back to A. L. Thomson, who suggested in 1926 that changing light color could result in a decline of the number of birds affected by artificial light (Thomson 1926). When the longer wavelengths of ceilometers (very bright vertically pointed spotlights that were developed in the late 1940s to measure the height of the cloud ceiling) were filtered so that mainly ultraviolet light remained, massive mortalities

Fig. 2. Schematized maps of the migrations of various bird groups through and around the North Sea area (van de Laar 1999). The following groups are distinguished: seabirds and waterbirds (black lines), raptors (green lines), shorebirds (blue lines), gulls and terns (orange lines), and songbirds (red lines). From top left to bottom right, maps are for July, August, September, October, November, and December.

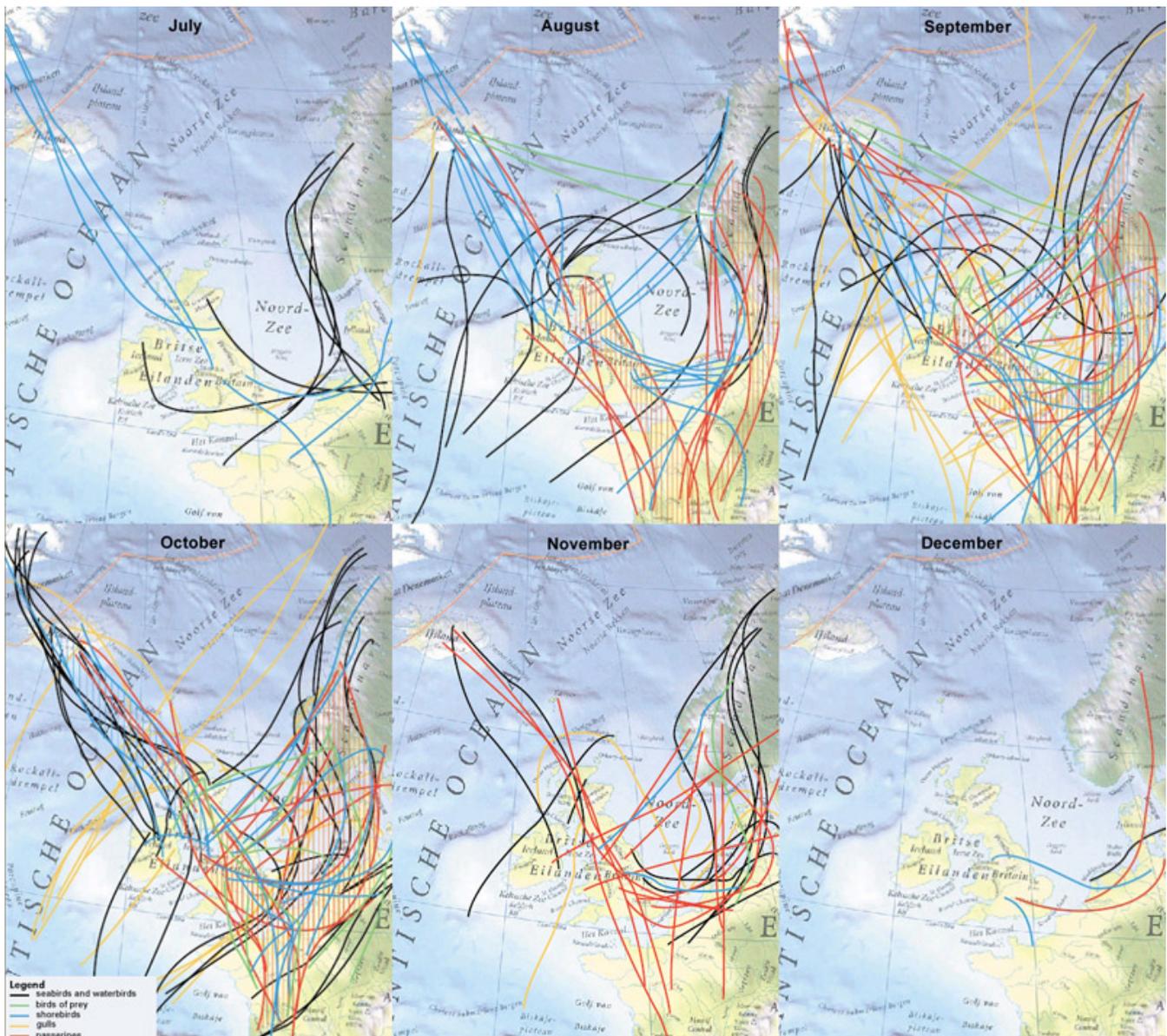


Table 1. Typical reaction rate of birds to light at sea during cloudy night migration as measured on the gas-production platform L5 (Marquenie and van de Laar 2004). The intensity of the lights when all lights were on, including main deck lights, was 30 kW.

Time in minutes after lights on	Number of birds
7	200–250
12	1000
20	1500
25	2000
30	4000–5000
Time in minutes after lights off	Number of birds
3	Significant decrease
15	All gone

among migratory birds due to these ceilometers were essentially eliminated (Gauthreaux and Belser 2006). However, being invisible to the human eye, ultraviolet light is not an option for offshore installations that must be visible to humans at a distance and where people must be able to work safely during the night. Thus, the challenge consists of developing bird-friendly lighting that is visible to the human eye, but does not attract and disorient nocturnally migrating birds. As a first step, we tested the response of nocturnally migrating birds to artificial lights of different colors during autumn migration in a field situation far removed from other artificial light sources.

METHODS

Our experiment was carried out directly next to a production site of the Nederlandse Aardolie Maatschappij (NAM) for natural gas on the eastern part of the Dutch Frisian (or Barrier) isle Ameland (53°45' N 5°68' E) (Fig. 3). This production site is located behind the North Sea beach, surrounded by sand dunes, and at about 10 km distance from the nearest village with artificial night lighting. During nighttime, the site is not artificially lit.

A 4.8-m lamp post with two identical 1000 W metal-halide lamps was used, directed northeastward at a 110° angle toward the sky. Lamps were alternately covered with red, green, blue or three opaque white Perspex filters. The opaque filters were used to control for intensity effects of the light. Absolute values of intensity and spectral composition measured at 0.57 m from the lamp and filter are shown in Fig. 4. Initially, measurements with white light did not include the Perspex filters. Thus, the measurements with white light were of variable light intensity. Measurements indicated that for wavelengths exceeding 450 nm, the three opaque white Perspex filters reduced illumination to 40% of the initial value.

Bird responses to the different colors were observed by the first author with the naked eye from an observation cabin made of wood and clear Perspex at some distance (about 15 m) behind the lamp standard in the shadow of the lights. In this arrangement, the observer was invisible to approaching birds, preventing a fright response from the birds. Observations started around 22:00 in the evening, as this turned out to be the time that migrants started to arrive on the island, and lasted throughout the night, except on nights with no or very little migration. Throughout the night,

Table 2. Relationship between light intensity and the number of birds attracted to gas-production platform L5 (Marquenie and van de Laar 2004). Disconnecting different light groups varied light intensity: beacon and obstruction lights (300 W), light in crane (1500 W), helicopter platform (160 W), and landing lights (480 W). When all lights were on, total intensity was 30 kW.

Installed light sources	Type of lighting	Number of birds
300 W	Red and green safety lights	None
1500 W	Sodium floodlights of crane	Small number
1960 W	Above sources plus helideck perimeter lighting	Limited numbers
640 W	Upward helideck TL lights	Numbers clearly increase
30000 W	Mostly TL (400x36 W) and sodium floodlights (20x400 W)	Large to very large numbers in times of heavy migration

observation periods were about 45 min per light color, alternated with 15-min breaks. In all, observations were collected over the course of 41 nights during autumn migration in 2003 (September–November) under various weather conditions. Moon phases were noted according to the monthly sun- and moon-phase calendar for Amsterdam. Cloud coverage was estimated on a scale of one-eighth of the sky covered as visible from the observation site. Wind direction, wind force, and precipitation were also noted, but not used in the subsequent analysis. Two categories of bird responses were distinguished: oriented flight (no reaction) and attraction to the light source (reaction). To avoid pseudoreplication due to group effects, both individual birds and bird groups were treated as single observations. As it was hard to identify birds at a species level, all observations were treated the same. The observed species were mostly passerines (thrushes and smaller songbirds), but also included some shorebirds, ducks, and geese.

Oriented flight was defined as flying in a straight line in the seasonally appropriate direction. As we mainly observed migrating birds coming from Scandinavia, we assumed a general North–South movement as being seasonally appropriate; see also Fig. 2. Birds flying straight lines but in different directions were not taken into account because they were most likely not autumn migrants. Directions were estimated when the bird or bird group flew

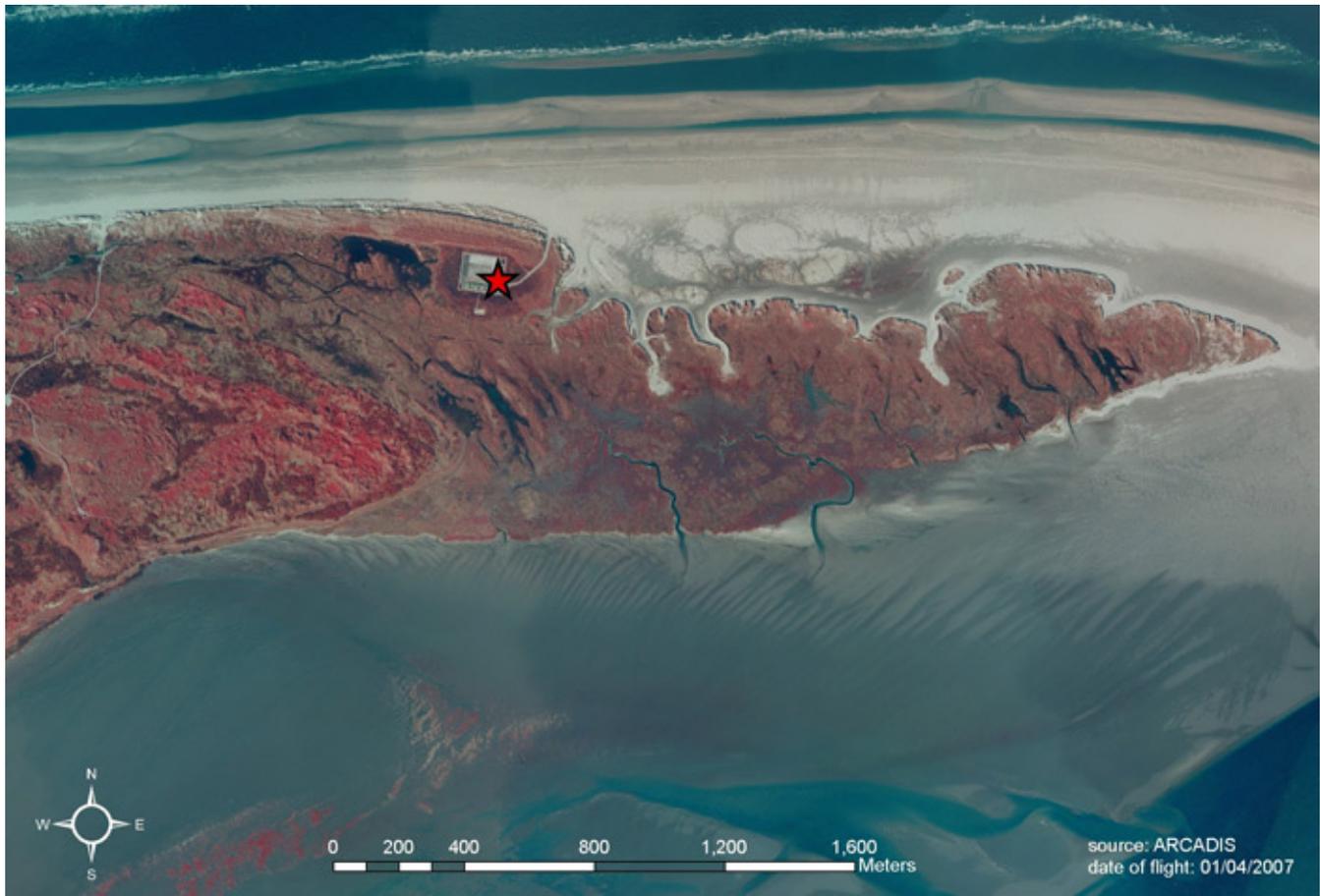
over the light source, which made it visible to the observer. Flight altitude of birds varied with weather conditions and species between ca. 10–100 m above the light source: birds flying higher could not be seen and were thus not included in this study.

We employed hierarchical log-linear modeling to statistically separate the possible effect of light conditions (white, red, green, and blue), overcast conditions (cloudy with more than 50% cloud cover or clear with at most 50% cloud cover), and moonlight (less than or equal to half moon, or more than half moon) on the reaction of the birds (reaction or no reaction).

We subsequently employed logistic regression to test the direction of the relationship between peak wavelength of the light and reaction of the birds. This analysis was necessarily restricted to the observations with red, green, and blue light and we included cloud cover as an additional independent variable.

Statistical analyses were performed using SPSS 15.0 for Windows (Release 15.0.1 dated 22 Nov 2006).

Fig. 3. Aerial view of the study area on 1 April 2007 (false color image produced by ARCADIS). The uninhabited eastern cape of the barrier island Ameland (Dutch Wadden Sea) is shown. The red star indicates the location of the artificial light source used for experiments.



RESULTS

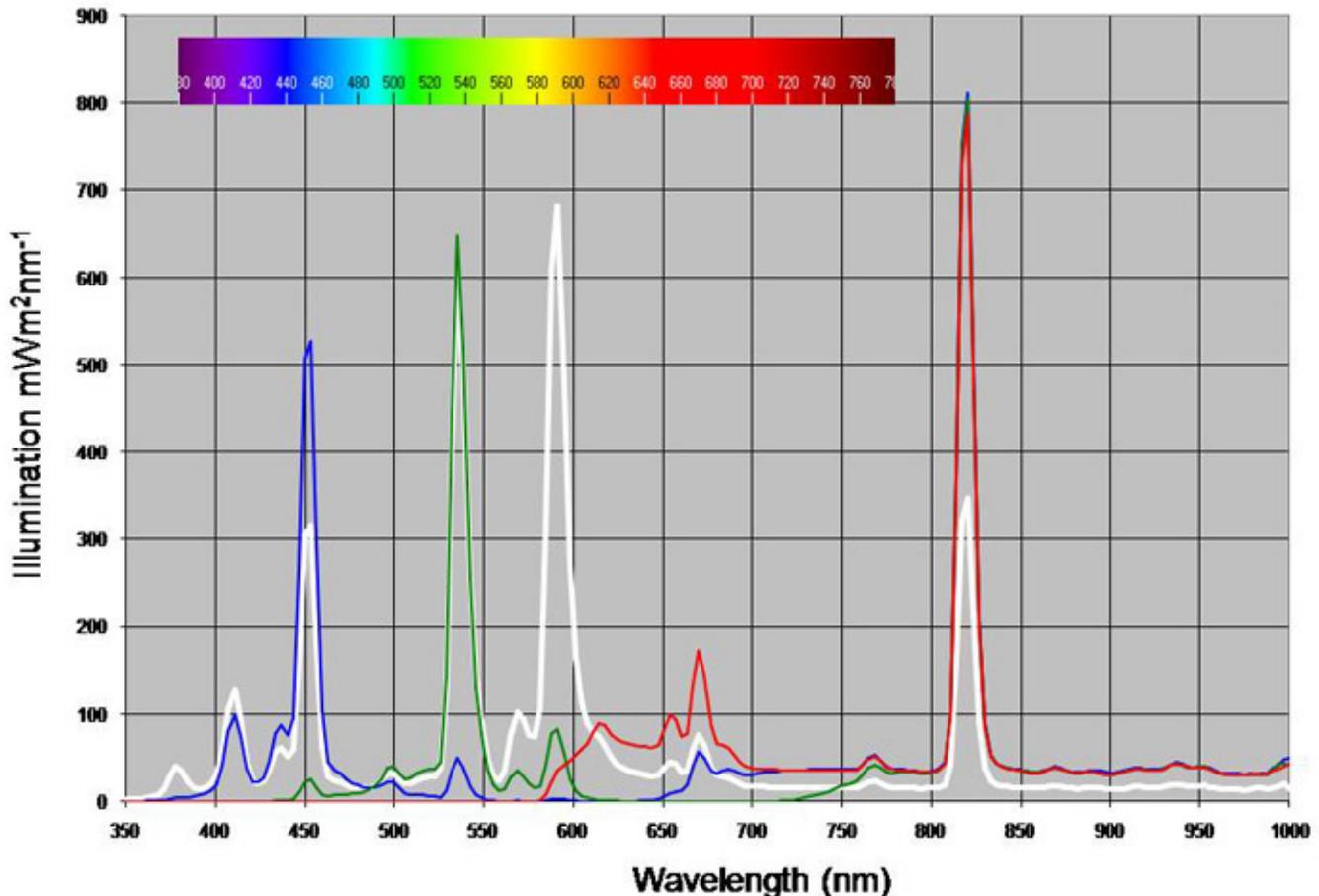
We obtained bird observations for all lamp types and weather conditions on different nights during the observation period. Light configurations (two types were used each night) were changed regularly in order to prevent possible order effects. The bird responses in all situations, including sample sizes, are given in Table 3.

Bird responses to the three different white-light conditions were statistically indistinguishable (Pearson $\chi^2 = 4.945$, $df = 2$, $P = 0.084$) and thus all white-light data, irrespective of intensity, were totalled for further analysis. Under white-light

conditions, the birds were significantly disturbed and attracted to the light source. The same is true for the red-light condition. In blue-light conditions, birds generally followed a seasonally appropriate migratory direction. In green light, birds were less well oriented than in blue light, but significantly less disturbed or attracted than in red and white light (Fig. 5). The effects of disturbance and attraction were strongest on overcast nights, regardless of lamp configuration, indicating primary use of celestial cues for migratory orientation.

We started the log-linear analysis with the fully saturated model including reaction (REACT), light conditions (COLOR), overcast conditions (CLOUD),

Fig. 4. The spectral shape of, respectively, the diffuser filter (white line), the blue filter (blue line), the green filter (green line), and the red filter (red line).



and moonlight conditions (MOON), i.e., the generating class of this model is REACT*COLOR* CLOUD*MOON. Table 4 shows the significance of all two-way and three-way interactions in this model involving the variable REACT, i.e., a reaction by the birds. There were highly significant two-way interactions between COLOR and REACT, and between CLOUD and REACT. The three-way interaction MOON*CLOUD*REACT bordered significance. We obtained the best-fitting hierarchical log-linear model ($\chi^2 = 9.867$, $df = 11$, $P = 0.542$) using backward elimination of terms, i. e., non-significant terms ($P > 0.05$) were dropped, starting with the least significant term. Comparing the best-fitting model with the model that excluded

the interaction between COLOR and REACT indicated that birds responded differently to different light conditions (partial $\chi^2 = 153.68$, $df = 3$, $P < 0.0001$). Comparing the best-fitting model with the model that excluded the interaction between CLOUD and REACT indicated that birds were also affected by overcast conditions (partial $\chi^2 = 13.71$, $df = 1$, $P < 0.001$). We found no effect of moonlight.

Logistic regression indicated that the probability that birds reacted to the light significantly increased with wave length of the light ($B = 0.013$, $Wald = 28.0$, $df = 1$, $P < 0.001$) and cloud cover ($B = 0.014$, $Wald = 4.8$, $df = 1$, $P = 0.029$). Thus, birds were

Table 3. Reaction of nocturnally migrating birds to different light conditions (peak wavelength indicated) under clear and overcast skies. It was noted that the red part of the spectrum is best characterized by a shoulder between 590–680 nm. The number of observations is given in parentheses, where groups are counted as a single observation.

Condition	Peak wavelength (nm)	% bird reaction clear sky	% bird reaction overcast conditions
White (diffuser)	—	60.5 (n = 38)	80.8 (n = 156)
Red	670	53.8 (n = 13)	54.2 (n = 24)
Green	535	12.5 (n = 8)	27.3 (n = 77)
Blue	455	2.7 (n = 37)	5.3 (n = 38)

more likely to respond to the light when it had a long wave length, i.e., when it was red, and when cloud cover was high, i.e., on overcast nights.

DISCUSSION AND CONCLUSION

As in other field studies, strongest bird responses were found in white light, which seems to interfere with visual orientation on celestial cues (Verheijen 1958, Evans Ogden 1996): the artificial light becomes a strong false orientation cue and birds can get trapped by the beam (Verheijen 1958, 1985).

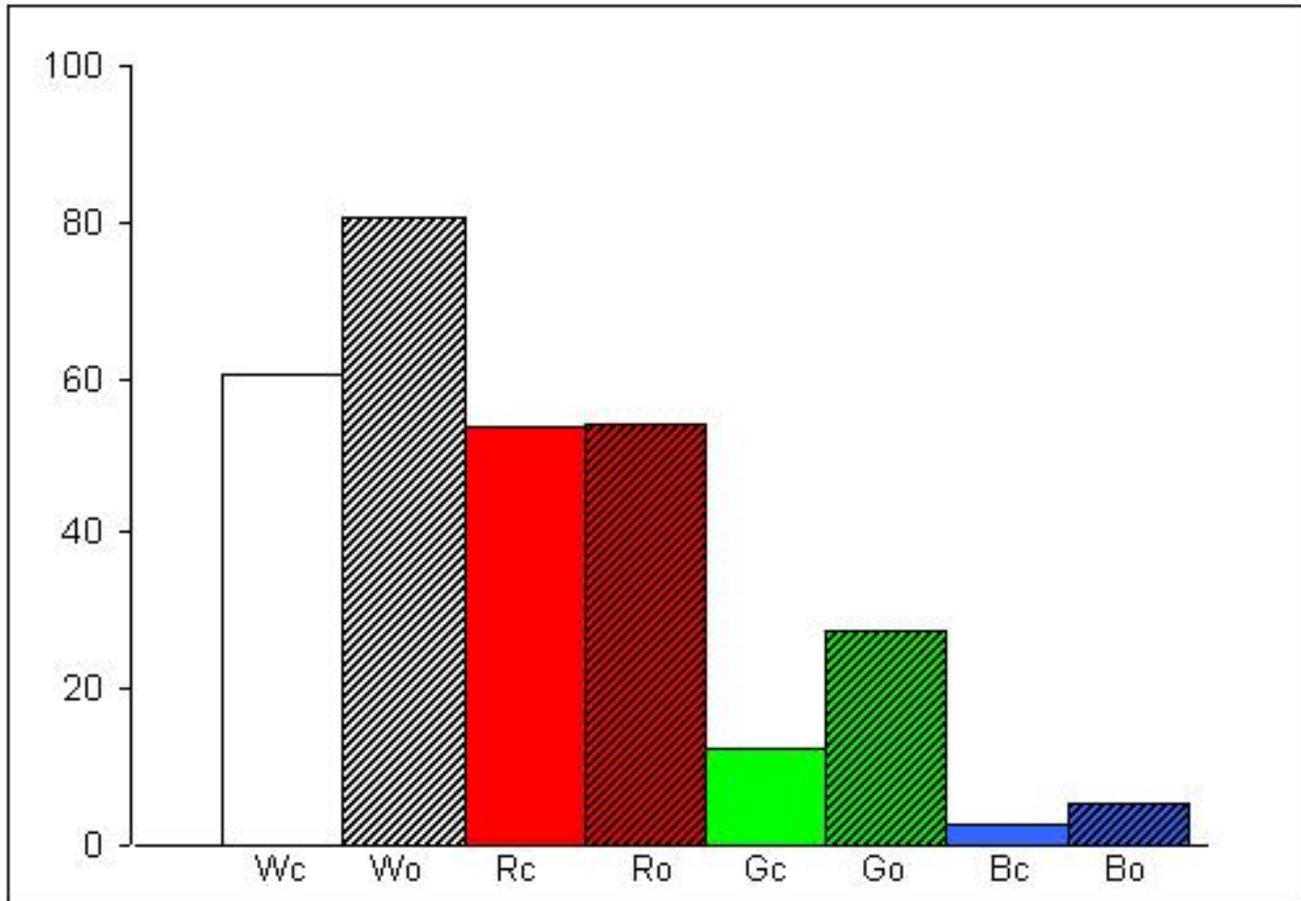
The bird responses observed in the colored-light conditions are similar to those of previous studies in the laboratory where red light caused disorientation by impairing magnetoreception (Wiltschko et al. 1993, Wiltschko and Wiltschko 1995b). In our study, birds were oriented in the seasonally appropriate migratory direction in blue light (Wiltschko et al. 1993, Wiltschko and Wiltschko 2001). As in these earlier laboratory studies, it was found that green light caused no or minor disturbance of orientation (Wiltschko and Wiltschko 1995b, Wiltschko et al. 2000, 2001, Wiltschko and Wiltschko 2001).

It is unlikely that differences in responses to various light conditions in our study were caused by differences in intensity. Red light caused disorientation at low light intensity, whereas the relatively high-intensity green light caused less

disorientation, even though birds are optimally sensitive to the green part of the spectrum (Maier 1992). Our results show also that bird responses to all light conditions are strongest on overcast nights when moon and starlight are unavailable as orientation cues. This finding is consistent with the outcome of previous research (Verheijen 1958, Evans Ogden 1996, Marquenie and van de Laar 2004). Overall, the results of our field study fit the hypothesis based on laboratory work that white and red light interfere with the magnetic compass of migrating birds. This magnetic compass is especially important to birds during overcast nights, when celestial cues are not visible. We did not find an effect of moonlight, but this could be due to small sample sizes. With larger sample sizes, we could have distinguished more than the two moonlight classes used in this study.

The impression that we derived from our observations on oil platforms leading up to this study was that birds could be attracted from up to 5 km distance with full lighting (30 kW). With the methodology of this study, we could not see birds flying much higher than 100 m, but the two lamps that we used were only 1 kW each. However, we cannot rule out the possibility that the birds that passed by in this study were already attracted to the experimental lamps from a much greater distance. At present, radar seems the only feasible option to study long-range responses of birds during the night. Future field experiments on the impact of bird-friendly lighting on nocturnally migrating birds

Fig. 5. Percentage of bird (groups) responding to different light conditions: white (W), red (R), green (G), and blue (B) under clear (c) and overcast (o) conditions during our observation period.



would do well to include the use of radar in their experimental setup.

From an applied perspective, the main conclusion that can be derived from this experiment is that birds do respond significantly differently under field conditions to various colors of artificial light, i.e., reactions of migratory birds to artificial light are largely determined by the wavelength characteristics of the light source. Migratory birds react strongest to white and red light (long wavelength); little to green light (shorter wavelength); and blue light (short wavelength) hardly causes any observable effect on the birds' orientation. Birds apparently did not react to the infrared heat radiation > 680 nm.

This led to the assumption that the visible long-wavelength part of the spectrum (excluding the infrared part) causes the disorienting effect on migrating birds. White light contains all parts of the spectrum (including long wavelengths), our red-light source only contained a small fraction of the long-wavelength part of the spectrum, and our green-light source contained very little long-wavelength radiation, whereas the blue-light source did not contain visible long-wavelength radiation at all.

Based on the results of the experiment presented here, it can be suggested that changing the color (spectral composition) of artificial lights for public

Table 4. Tests of all two-way and three-way partial associations involving reaction of the birds (REACT) in the fully saturated hierarchical log-linear model with generating class COLOR*MOON*CLOUD*REACT.

Effect name	Partial χ^2	df	P
COLOR*MOON*REACT	3.26	3	0.354
COLOR*CLOUD*REACT	1.50	3	0.682
MOON*CLOUD*REACT	3.59	1	0.058
COLOR*REACT	154.62	3	<0.001
MOON*REACT	0.94	1	0.331
CLOUD*REACT	11.29	1	<0.001

roads and on human-built structures will significantly decrease the number of casualties among nocturnally migrating birds. Therefore, as a follow-up, the electronics company Philips experimentally developed bird-friendly light sources, low in red. It was not possible to include only blue light, even though this would seem optimal from the point of view of the birds. The problem is that humans cannot work safely under blue light. Therefore, the newly developed light source includes the green spectrum and appears greenish to human observers. We replaced the lights of the offshore gas-production platform L15 with these new bird-friendly light sources in autumn 2007. Figure 6 shows that the platform is sufficiently visible from a distance with the new lighting and so far the crew of the platform has not filed complaints about the new working conditions. In fact, an unexpected added bonus of the newly developed bird-friendly lamps is that the platform crew stated that they were less blinding and increased contrast vision during crane operations. Preliminary observations also suggest that far fewer birds are attracted to the platform (van de Laar 2007). Just how strong the reduction is remains to be determined.

Our study has initiated new research on the effects of artificial lighting on migrating birds and the possibilities of the further development of bird-friendly artificial lighting that would still be safe for humans to work with. This light will lack the long-

wavelength part of the spectrum and will thus be seen as greenish by human eyes. Additional advantages of using such a new type of lighting are improved contrast due to the high sensitivity of the human eye for the green part of the spectrum, better reflection on (green) roadside vegetation, and potentially less disturbance of natural vegetation (flowering, seed setting, and germination) by affecting the red:far-red ratio (see, e.g., Pons 1986).

The concept of bird-friendly lighting can potentially be used everywhere, both off- and onshore, artificial night lighting affects migrating birds. Examples include marine ports, coastal refineries, industrial areas, highways, airports, etc. However, as the recent book on ecological consequences of artificial night lighting edited by Rich and Longcore (2006) abundantly proves, migratory birds are not the only species harmed by artificial night lighting. What is needed now are systematic investigations into the impact of bird-friendly light on other organisms than birds. In the case of oil platforms in the North Sea, for instance, the possibility that migratory fish and sea mammals are also affected cannot be ruled out. The question we now face is whether it is possible to develop light sources that satisfy human demands, yet do not harm the ecosystem in general.

Fig. 6. Photo of the Nederlandse Aardolie Maatschappij (NAM) offshore gas-production platform L15, situated in the North Sea about 20 km offshore of the barrier island Vlieland (photo courtesy NAM), after our light-color recommendations were acted upon. At the time of the photo, some of the white lights still needed to be replaced by green lights.



Responses to this article can be read online at:
<http://www.ecologyandsociety.org/vol13/iss2/art47/responses/>

Acknowledgments:

This work was funded by NAM. We thank the NAM Ame-1 crew and J. A. Poot for their help in conducting the experiments.

LITERATURE CITED

- Åkesson, S., and J. Bäckman. 1999. Orientation in pied flycatchers: the relative importance of magnetic and visual information at dusk. *Animal Behavior* 57:819–828.
- Avery, M., P. F. Springer, and J. F. Cassel. 1977. Weather influences on nocturnal bird mortality at a North Dakota Tower. *Wilson Bulletin* 89:291–299.
- Cinzano, P., F. Falchi, and C. D. Elvidge. 2001. The first world atlas of the artificial night sky brightness. *Monthly Notices of the Royal Astronomical Society* 328:689–707.
- Cochran, W. W., and R. R. Graber. 1958. Attraction of nocturnal migrants by lights on a television tower. *Wilson Bulletin* 70:378–380.
- Deutschlander, M. E., J. B. Phillips, and S. C. Borland. 1999. The case for light-dependent magnetic orientation in animals. *The Journal of Experimental Biology* 202:891–908.
- Emlen, S. T. 1967. Migratory orientation in the Indigo bunting, *Passerina cyanea*. Part I. *The Auk* 84:309–342.
- Emlen, S. T., W. Wiltschko, N. J. Demong, R. Wiltschko, and S. Bergman. 1976. Magnetic direction finding: evidence for its use in migratory Indigo buntings. *Science* 193:505–508.
- Evans Ogden, L. J. 1996. *Collision course: the hazards of lighted structures and windows to migrating birds*. WWF Canada and Fatal Light Awareness Program, Toronto, Ontario, Canada.
- Evans Ogden, L. J. 2002. *Summary report on the bird friendly building program: effect of light reduction on collision of migratory birds*. A special report for the Fatal Light Awareness Program (FLAP), Toronto, Ontario, Canada.
- Gauthreaux, S. A., and C. G. Belser. 2006. Effects of artificial night lighting on migrating birds. Pages 67–93 in C. Rich and T. Longcore, editors. *Ecological consequences of artificial night lighting*. Island Press, Washington, D.C., USA.
- Herbert, A. D. 1970. Spatial disorientation in birds. *Wilson Bulletin* 82:400–419.
- Longcore, T., and C. Rich. 2004. Ecological light pollution. *Frontiers in Ecology and the Environment* 2:191–198.
- Maier, E. J. 1992. Spectral sensitivities including the ultraviolet of the passeriform bird *Leiothrix lutea*. *Journal of Comparative Physiology A* 170:709–714.
- Marquenie, J. M., and F. van de Laar. 2004. Protecting migrating birds from offshore production. *Shell E&P Newsletter*: January issue.
- Mouritsen, H., and O. N. Larsen. 2001. Migrating songbirds tested in computer-controlled Emlen funnels use stellar cues for a time-independent compass. *The Journal of Experimental Biology* 204:3855–3865.
- Mouritsen, H., G. Feenders, M. Liedvogel, K. Wada, and E. D. Jarvis. 2005. Night-vision brain area in migratory songbirds. *Proceedings of the National Academy of Science* 102:8339–8344.
- Muheim, R., J. Bäckman, and S. Åkesson. 2002. Magnetic compass orientation in European robins is dependent on both wavelength and intensity of light. *The Journal of Experimental Biology* 205:3845–3856.
- Pons, T. L. 1986. Response of *Plantago major* seeds to the red/far-red ratio as influenced by other environmental factors. *Physiologia Plantarum* 68:252–258.
- Rich, C., and T. Longcore, editors. 2006. *Ecological consequences of artificial night lighting*. Island Press, Washington, D.C.
- Ritz, T., S. Adem, and K. Schulten. 2000. A model for photoreceptor-based magnetoreception in birds. *Biophysical Journal* 78:707–718.

- Thomson, A. L.** 1926. *Problems of bird migration*. H. F. and G. Witherby, London, UK.
- van de Laar, F. J. T.** 1999. *Vogeltrek boven de Noordzee*. Uitgave SBNO, NAM, Assen, The Netherlands.
- van de Laar, F. J. T.** 2007. *Green light to birds. Investigation into the effect of bird-friendly lighting*. Report NAM locatie L15-FA-1. NAM, Assen, The Netherlands.
- Verheijen, F. J.** 1958. The mechanisms of the trapping effect of artificial light sources upon animals. *Archives Néerlandaises de Zoologie* **13**:1–107.
- Verheijen, F. J.** 1985. Photopollution: artificial light optic spatial control systems fail to cope with. Incidents, causations, remedies. *Experimental Biology* **44**:1–18.
- Wiese, F. K., W. A. Montevecchi, G. K. Davoren, F. Huettmann, A. W. Diamond, and J. Linke.** 2001. Seabirds at risk around offshore oil platforms in the northwest Atlantic. *Marine Pollution Bulletin* **42**:1285–1290.
- Wiltschko, R., and W. Wiltschko.** 1995a. *Magnetic orientation in animals*. Springer Verlag, Berlin, Germany.
- Wiltschko, R., and W. Wiltschko.** 2003. Avian navigation: from historical to modern concepts. *Animal Behavior* **65**:257–272.
- Wiltschko, W., M. Gesson, and R. Wiltschko.** 2001. Magnetic compass orientation of European robins under 565 nm green light. *Naturwissenschaften* **88**:387–390.
- Wiltschko, W., and F. W. Merkel.** 1966. Orientierung zugunruheriger Rotkehlchen im statischen Magnetfeld. *Verhandlungen der Deutschen Zoologischen Gesellschaft* **32**:362–367.
- Wiltschko, W., U. Munro, H. Ford, and R. Wiltschko.** 1993. Red light disrupts magnetic orientation of migratory birds. *Nature* **364**:525–527.
- Wiltschko, W., and R. Wiltschko.** 1995b. Migratory orientation of European robins is affected by the wavelength of light as well as by a magnetic pulse. *Journal of Comparative Physiology A* **177**:363–369.
- Wiltschko, W., and R. Wiltschko.** 1999. The effect of yellow and blue light on magnetic compass orientation in European robins, *Erithacus rubecula*. *Journal of Comparative Physiology A* **184**:295–299.
- Wiltschko, W., and R. Wiltschko.** 2001. Light-dependent magnetoreception in birds: the behavior of European robins, *Erithacus rubecula*, under monochromatic light of various wavelengths and intensities. *The Journal of Experimental Biology* **204**:3295–3302.
- Wiltschko, W., R. Wiltschko, and U. Munro.** 2000. Light-dependent magnetoreception in birds: the effect of intensity of 565 nm green light. *Naturwissenschaften* **87**:366–369.



Ocean Energy Group

REA RESPONSE TO THE GOVERNMENT CONSULTATION ON THE UK OFFSHORE ENERGY STRATEGIC ENVIRONMENTAL ASSESSMENT

The Renewable Energy Association represents British renewable energy producers and promotes the use of sustainable energy in the UK. The membership is active across the whole spectrum of renewables, including wave and tidal, electric power, heat and transport fuels.

The REA represents a wide variety of organisations, including generators, project developers, fuel and power suppliers, equipment producers and service providers. Members range in size from major multinationals to sole traders. There are over 570 corporate members of the REA, making it the largest renewable energy trade association in the UK.

's is to secure the best legislative and regulatory framework for expanding renewable energy production in the UK. The Association undertakes policy development and provides input to government departments, agencies, regulators and NGOs.

In order to cover sector-specific issues, a number of so- s s' s up. The Ocean Energy Resource group, comprising more than 100 individuals, covers wave energy and tidal energy. The primary focus of the Group is the progress of energy conversion device development to prove the capability and survivability of full-scale prototypes, and the transitional measures required to finance projects and bring them to commercial fruition. The results of the UK Offshore Energy Strategic Environmental Assessment (SEA) are of fundamental interest to the Group since a similar SEA in English and Welsh waters is required for wave and s industry beyond

Scotland, where a full marine SEA has already been conducted.

This response to the UK Offshore Energy SEA consultation was formulated following discussions at a meeting of Ocean Energy Group on 12th March 2009.

The UK Wave and Tidal Energy Industry and the Offshore SEA

In 1997, the Marine For s s s ss renewable energy available in the oceans could be converted to electricity, it would satisfy the s

The UK possesses 's tidal energy resource (10-15% of the global resource) and 's s We currently lead the world in the development of wave and tidal stream device development. Exploitation of tidal and wave energy offers significant benefits to the UK, through the supply of a clean, renewable and secure source of energy and by 's s ss s

The Carbon Trust estimates that wave and tidal stream energy could contribute 15-20% of the UK's for the proposed Severn Barrage (which utilises tidal head rather than tidal stream technology) predicts that it could contribute an additional 5% of UK demand.

It is therefore vital that the government conducts a wave and tidal energy SEA in English and Welsh territorial waters, in order to progress the deployment of commercial-scale wet renewables in these areas. Until this work is completed, the Crown Estate will grant only short-term leases for

demonstration projects, which are defined as being no larger than 10MW. Such terms are not of interest to large utility companies and major investors.

The beneficial effect of conducting the requisite SEA on deployment of marine renewables is illustrated by the flurry of activity in the Pentland Firth, following the completion of the Scottish marine SEA and the subsequent announcement of a bidding round for commercial-scale sites by the Crown Estate in September 2008. Thirty eight individual companies and consortia have been invited to tender, following confirmation of their interest by registering for the pre-qualification process.

The REA believes that it would have been a more effective and efficient use of public funds if an SEA for wave and tidal energy had been conducted alongside the SEA that is the subject of the present consultation. The cost of including wave and tidal would have been insignificant in comparison to the cost that will now be incurred in conducting a separate SEA.

Evidence for this appears in the Non-Technical Summary of the UK Offshore Energy SEA:

- There is much overlap between the wave and tidal energy deployment activities that can interact with the natural and broader environment and those activities listed for offshore wind, oil and gas on page x of the Summary
- A similar overlap exists for interactions with other users of the marine space and material assets, as described on pages xvi- xviii of the Summary
- The interrelationships and cumulative effects described on page xviii of the Summary are incomplete without the inclusion of wave and tidal energy

the poten s s s s s s s s s s It is clear that the most sensible route would have been to conduct an offshore SEA encompassing **all** forms of marine energy offshore wind, wave and tidal, plus oil and gas.

Comments on specific recommendations of the UK Offshore Energy SEA

The REA welcomes this opportunity to comment on the findings of the UK Offshore Energy SEA. We are pleased that the work has been conducted since it will enable further rounds of offshore wind farm leasing, which is crucial if the UK is to achieve its 2020 renewable energy targets. We cautiously support the findings and recommendations of the SEA, subject to the following provisos:

Recommendation 1 states: *In areas with high renewable energy generation potential DECC should ensure decisions on renewable energy leasing and licensing for oil & gas (including natural gas storage) are coordinated to minimise potential sterilisation of areas for other industries. This recommendation extends to maintaining options for potential future geological storage of captured carbon dioxide*”.

The REA believes it is imperative that this recommendation specifically states that the coordination relates to wave and tidal energy generation, particularly for the limited areas of UK waters containing a high wave or tidal stream energy resource.

Recommendation 3 states: *“Until there is a firmer base of information available to inform adaptive management, in respect of ecological receptors, a precautionary approach to siting is recommended since the offshore wind industry is relatively young, with appreciable technological development expected in for example, turbine size, rotation speed, spacing and potentially rotational axis. This precautionary approach dictates that unless suitable evidence indicates otherwise, avoidance (for the present) of areas known to be of key importance to waterbird and*

marine mammal populations, including breeding colonies, foraging areas and other areas essential to the survival of populations”.

The marine renewables community is by definition environmentally aware and the industry embraces environmental best practice. Our concern regarding application of the precautionary approach is that it makes it impossible to acquire evidence of minimal impact on the environment, as referred to in this recommendation. The REA would encourage regulators to accept that some

s s s s

Recommendation 4 *s s Reflecting the relative sensitivity of multiple receptors in coastal waters, this report recommends that the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km)”.*

Despite reassurance that the proposed coastal buffer zone is not intended as an exclusion zone, the REA is concerned that this statement is unnecessarily harsh and may deter developers from taking forward viable offshore wind projects, because of the expected consequential cost of underwater cabling.

I trust that the above comments are helpful. Please do not hesitate to contact the REA if you wish to discuss any of the points we have raised in this response to the UK Offshore Energy SEA consultation.

Dr Stephanie Merry
Head of Marine
Renewable Energy Association
April 2009



Renewable Energy Systems Ltd
Beaufort Court, Egg Farm Lane, Kings Langley
Hertfordshire WD4 8LR, United Kingdom
T +44 (0) 1923 299 200 F +44 (0) 1923 299 299
E info@res-group.com www.res-group.com

Offshore Energy SEA Consultation
The Department of Energy and Climate Change (DECC)
4th Floor Atholl House
86-88 Guild Street
Aberdeen, AB11 6AR

By email only

21st April 2009

Dear Sir / Madam,

Offshore Energy SEA Consultation

RES welcomes the opportunity to respond on the Department for Energy and Climate Change's Offshore Energy Strategic Environmental Assessment (SEA) consultation.

RES has been actively involved in the offshore wind farm industry since its inception as a developer and also as a provider of construction management and engineering services. RES developed the R1 Inner Dowsing wind farm and continues to provide a significant contribution to the development and construction of Centrica's R2 projects in the Greater Wash Strategic Area. RES has also played an important role in supporting industry liaison and support groups.

RES is therefore suitably well placed to comment on the SEA report for offshore energy.

General Comments on the SEA

RES welcomes the conclusion *"that there are no overriding environmental considerations to prevent the achievement of the offshore oil & gas, gas storage and wind elements of the plan/programme, albeit with a number of mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea"*. However, RES does have some concerns with the recommended measures to prevent, reduce and offset significant adverse impacts. Importantly, the SEA should consider Environmental Impact Assessment as a tool to identify and mitigate potential impacts on the plan/programme.

Coastal buffer

The reasons given for the recommendation of a 12 nm coastal buffer are not clear and further confused by the statement in the conclusion of the non-technical summary that *"the proposed coastal buffer is not intended as an exclusion zone, since there may be scope for further offshore wind development within the area, but as mitigation for the potential environmental effects of development which may result from this draft plan/programme"*. Whilst there may be more existing constraints to development within coastal zones, a buffer based on 'possible' impacts is

too precautionary an approach. A better approach would be to note that potential impacts can be mitigated through undertaking a robust EIA prior to development to judge the level of impact of a specific plan/programme. This is a point that is well made later in the conclusions of the SEA.

Landscape and Seascape

Further clarity is required in the recommendations made to mitigate impacts of the plan/programme on landscape and seascape. How potential impacts on this environment contribute to a recommendation of a coastal buffer, are not clear and their appears to be a presumption of negative effects, which differs to our experience; the R2 Lincs wind farm, located 8 km off the Lincolnshire coast received an overwhelming positive response from local residents. An arbitrary buffer set now will serve little purpose apart from providing a useful tool for opponents to development within this zone.

Shipping and Navigation

MCA Marine Guidance Note 371 places great emphasis on the collection of robust shipping survey data and production of a Navigation Risk Assessment during the Environmental Impact Assessment phase of a plan/programme to determine the potential impact of that plan/programme on shipping and navigation. RES would recommend that we continue to use this tried and tested method to identifying the specific impact of wind farm development site-by-site on shipping rather than to arbitrarily preclude all development in areas that are important for shipping.

Grid

The 'likely evolution of the baseline' should also consider grid. Meeting future UK power demands will require significant reinforcement of the current Transmission Network, whether that demand is met by offshore wind or other forms of energy production.

If you require any further clarification on this response please don't hesitate to get in touch,

Yours sincerely,

Gero Vella
Environmental Consents Manager
RES Offshore

From: Richard Cowen
Sent: 31 March 2009 00:10
To: sea.2009@berr.gsi.gov.uk; sea.2009@berr.gsi.gov.uk
Subject: Offshore Energy SEA Consultation

Dear Sir,

I refer to the Consultation Document in respect of the above.

First, I wish to comment that I fully support the Marine and Coastal Access Bill. I consider that a coastal footpath so far as is possible is highly desirable. Marine Conservation Zones are long overdue in this country. Other countries have established similar protection areas for marine life and I consider it is a disgrace that there is not at this stage statutory (as opposed to voluntary) protection for sensitive marine areas in this country. I have dived at St Abbs and off the Farne Islands - surely these areas warrant such protection for their diversity of marine life. And if the underwater environment is not protected, the diversity above the waves will soon be affected - as indeed may already have occurred with bird breeding rates crashing in many coastal areas.

I acknowledge that the Bill also makes provision for exploitation of the seas. Clearly this has been happening, not just in fishing but also mineral extraction, for generations. Overfishing, particularly in sensitive areas, may well be a greater cause of recent poor breeding success of seabirds than climate change. It may now be a little late in respect of mineral extraction as I understand gas and oil exploitation may be drawing to a close, but even so some control of this together with suitable national policies must be helpful. I appreciate both these subjects are likely to be very controversial.

However I think the primary purpose of this document is to consider renewable energy. I must start by commenting that, whatever the IPCC scientists may say, I remain sceptical about the causes and effects of climate change. Indeed, after two relatively cool winters, one is perhaps entitled to question whether any climate change is more cyclical than man made. I understand there has been more snow in ski resorts this year than for many a year.

On shore wind farms are clearly controversial. Whatever Mr Milliband may say about objectors being socially irresponsible, they cause considerable concern and there is increasing evidence that they may have a detrimental effect on the health and wellbeing of nearby residents. In addition, evidence obtained from the OFGEM ROC register suggests they are significantly underperforming - indeed, David Wighton in the Times on 6 March stated that during January they only operated at 10% of installed capacity.

In addition, it is generally acknowledged that wind farms need shadowing by conventional sources of power. Wind can never provide the base load. E.ON has stated that wind farms need perhaps 80 to 90% shadowing from these sources. That must significantly affect the claimed reductions in CO2 emissions but this aspect is rarely if ever mentioned in planning applications.

Consequently, whatever the situation may or may not be regarding climate change, one must question the validity of Mr Milliband's comment about social irresponsibility.

Off shore wind farms do perhaps have a more reliable fuel source. There is clearly more wind off shore than on shore. But even here it cannot be guaranteed and indeed there may be a greater problem with winds being too strong, when again turbines do not operate.

Clearly off shore wind farms do not cause the same problems to landscape and people's residential

amenities as on shore wind farms. But they can still affect sensitive land and seascapes. I think that the suggestion in this Assessment that large off shore windfarms of 100MW or more should be at least 12 miles off shore is a valid one. 100 MW however is a very large wind farm indeed and I suggest the 12 mile limit should apply to more than this. Indeed, I believe that care must be taken to prevent a series of smaller wind farms from being allowed within this 12 mile limit that, cumulatively, will amount to a large wind farm of these proportions.

I note the comments in the Assessment concerning how such development may affect wildlife. Birds obviously are particularly vulnerable. I am a keen bird watcher and am very aware that Britain has a seabird population that is perhaps second to only a very few. While these birds may often hug the coast that is far from always the case. Puffins and guillemots may come ashore to breed but spend the rest of the year out to sea. Common Scoter are very sensitive to noise and while they may want shallower waters are not always close to land.

I may have missed it, but have not noticed any reference to migrating birds. These of course are not sea birds but so many birds cross not just the Channel but also the North Sea. As I understand it, many travel at night. The risk of turbine collision for these birds must be high, and the only way we will have any idea as to whether it has happened is if numbers of migrating birds fall significantly. The chances of recovering bodies from the sea are nil. I fear the Assessment underplays the potential effect on birds generally.

The Assessment also considers the effect on fish and mammals, not just from noise but also from warming that may be associated with underwater cables and with electrical waves escaping from them. There is also of course the question of disturbance of the sea bed. With the numbers of off shore turbines being considered, this may be a significant factor. I think the Assessment properly draws attention to these factors but perhaps significantly underplays the potential effect of so many turbines off our shores.

We have all heard of whales and other cetaceans coming ashore. I am no whale expert but understand no one really knows why although military sonar has been blamed. I question whether there is likely to be a significant increase in view of the likely noise (particularly low frequency noise) from off shore turbines.

The Assessment suggests the risk to bats of collision is minimal. I am not sure of the migratory habits of bats and this finding may be because they do not cross the sea. However I am aware that it has recently been suggested that the greater cause of bat deaths from wind turbines does not come from collision, but the changes they cause in air pressure which bats cannot tolerate. This is not addressed in the Assessment.

I am aware there may be other problems with off shore turbines that affect other organisations. That is for them to comment upon. The only one I wish to mention is aircraft safety. I know wind turbines affect radar and while this may be primarily for those involved in the air industry to comment upon, I would like to think that when I am in a plane I am as safe as possible and that air traffic control does not lose the position of my and other planes when they are over wind farms

Richard Cowen

Old Quarrington
Durham



Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

E-mail: sea.2009@berr.gsi.gov.uk

RYA House
Ensign Way, Hamble
Southampton SO31 4YA
United Kingdom

Tel +44 (0) 23 8060 4100
Fax +44 (0) 23 8060 4299
www.rya.org.uk

Direct tel: +44 (0)23 8060 4222
Direct fax: +44 (0)23 8060 4294
Email: susie.tomson@rya.org.uk

06 April 2009

Dear Sir

Consultation on UK Offshore Energy Strategic Environmental Assessment. Future Leasing for Offshore Wind Farms and Licensing for Offshore Oil & Gas and Gas Storage - Environmental Report, January 2009

We refer to the Department's consultation in relation to the above. We set out below our comments on the Environmental Report.

The RYA is the national body for all forms of recreational and competitive boating. It represents dinghy and yacht racing, motor and sail cruising, RIBs and sportsboats, powerboat racing, windsurfing, inland cruising and personal watercraft. The RYA manages the British sailing team and Great Britain was the top sailing nation at the 2000, 2004 and 2008 Olympic Games.

The RYA is recognised by all government offices as being the negotiating body for the activities it represents. The RYA currently has over 100,000 personal members, the majority of whom choose to go afloat for purely recreational non-competitive pleasure on coastal and inland waters. There are an estimated further 500,000 boat owners nationally who are members of over 1,500 RYA affiliated clubs and class associations.

The RYA also sets and maintains an international standard for recreational boat training through a network of over 2,200 RYA Recognised Training Centres in 20 countries. On average, approximately 160,000 people per year complete RYA training courses. RYA training courses form the basis for the small craft training of lifeboat crews, police officers and the Royal Navy and are also adopted as a template for training in many other countries throughout the world.

The RYA welcomes this opportunity to comment on the Environmental Report.

1 General comments

1. The SEA covers the development of offshore wind energy, offshore oil and gas extraction and gas storage. Of primary concern to the RYA is the development of offshore wind energy. Our concerns with these developments can be summarised as follows:

- **Navigational safety:** Collision risk; Risk management and emergency response; Marking and lighting; Effect on small craft navigational and communication equipment; Weather
 - **Location:** Loss of cruising routes; Squeeze into commercial routes; Effect on sailing and racing areas; Cumulative effects; Visual intrusion and noise
 - **End of life:** Dereliction; Decommissioning
 - **Consultation**
2. We would encourage future reports to be consistent in their terminology and refer to distances at sea in nautical miles and fractions of nautical miles and navigational speed accordingly should be measured in knots. Reference to kilometres, if required, should follow the nautical miles in brackets. Depths and heights should be measured in metres.

2 Site Selection

1. It is our belief that in order to achieve the objectives as set out in the SEA, there are areas of the identified zones that would not be able to be developed. Objectives of specific relevance to the RYA are:
 - Balance other UK responses and activities (including recreation) with the need to develop offshore energy resources
 - Safety of navigation
2. The report highlights that due to the scale of the proposed development an issue previously considered minor may result in a major impact. In addition, commercial and recreational navigation previously not in conflict may be brought into direct conflict with associated safety implications as a result of the developments. We would support that all future developments fully consider the cumulative effects of their site. Navigation is considered a key spatial issue and free unconstrained navigation routes are vital to the UK and a requirement in both territorial and EEZ under UNCLOS. The report recognises the need to minimise any increase to the risk of collision and vessel passage time through route deviation which clearly has its own implications in terms of carbon emissions.
3. We are fully supportive of Recommendation 2 (a) and (e) in the report that states: Offshore wind farms should aim to minimise the disruption, economic loss and safety risks to other users of the sea and for the UK as a whole there should be a presumption against development which impinges on major commercial navigation routes, significant increase in collision risk or causes appreciably longer transit times and results in significant detriment to tourism, recreation and quality of life.
4. The proposed development for offshore wind is considerable. An area of 10,000km² could be occupied by 5000 turbines. Whilst we understand that the actual developments will only take up part of the identified 'zones', at this stage we have to assume that developers would attempt to maximise single development in each zone and it is unclear as to which zones at present would be favoured.
5. The extent of the project has resulted in the report concluding that there will be a significant environmental effect, including a significant effect on other users of the sea. We are encouraged that the report sees this significant effect on navigation. As a result, the report concludes that the bulk of the generation capacity should be away from the coast, generally outside the 12nm. The RYA is extremely supportive of this conclusion and feels that much of the potential risk to recreational craft posed by such large scale development will be avoided by keeping development beyond 12nm. We should also like to emphasise as stated in the report, that 12nm is the minimum distance from the coast that is found in other European developments.

6. We do acknowledge that there may be some scope for development within the 12nm buffer but this would be based on more work. We assume that this would be in areas lightly used by navigation (commercial and recreational) as well as for other reasons.
7. We are supportive of the statement that IMO routing measures and MCA advice on 'siting not recommended' will be taken into account and for general development guidance on OREI's, developers should refer to MGN 371.

3 Data on recreational boating

1. The SEA states that it intends to consider the environmental implications of the plan which includes interactions with 'other users of the sea'. Navigation is included in 'other users of the sea' and we are pleased to see that the report does identify 'yachting' as a specific activity. It should however, be emphasised that whilst 4 weeks of AIS data has been collected for the SEA this method will not pick up the majority of recreational craft which are not required to carry an AIS transponder. We are pleased to see the RYA Atlas of Recreational Boating has however been used to identify recreational routes, sailing and racing areas. We enclose a copy of the Atlas for reference. Further copies can be requested from the RYA and we would expect this information to be used in specific site selection.
2. The Atlas is an important source of information for recreational boating activity as it gives a comprehensive picture of an informal activity that is difficult to accurately monitor. Recreational and commercial navigation differ in many ways and the understanding that recreational navigation avoids the main shipping routes on the basis of safety is of paramount importance when planning for offshore wind developments often requiring space to be retained outside commercial shipping lanes for recreational routes. In addition it should be understood that sailing yachts will not necessarily follow a direct line between A and B, their line of travel depends on the direction of the wind on the day.

4 Navigating around wind farms

1. We note that the understanding of wakes between turbines is likely to result in an increased distance between turbines as well as between wind farms. 0.5 nm (850m) between the turbines in rows, 0.7 nm (1200m) between rows and 3nm (5km) between farms. The report also states that vast majority of recreational vessels would not be excluded from the wind farm development areas. On the basis of the above figures and in favourable conditions, a mariner would be happy to transit a wind farm area and we would not expect them to be excluded from the site. However, in unfavourable conditions which must be planned for, the mariner may opt to avoid the site all together in which case extending the time at sea and increase the risk to their safety in these adverse conditions.
2. Deviation of routes should include recreational vessels and it should be noted that in unfavourable conditions, recreational vessels may well avoid these developments increasing travel time. 5 knots speed is generally used for average passage planning.
3. We have developed what we regard as a safe rotor clearance height for the majority of recreational craft at 22m above MHWS. We note that the report states this clearance should be adhered to unless there is proof that a lower level carries no added risk. We would not support a proposal where this height is reduced. It should be noted that as vessels increase in size and technology improves, mast height is likely to increase, not decrease. This factor alone should preclude the consideration of a lower level.
4. Marking, lighting and visibility of offshore wind farms has been standardised and Trinity House takes the lead on this. We liaise with Trinity House as to any concerns we may have and expect them to be fully consulted and continue to take the lead in this matter.

5 Identifying development

1. On the basis of the SEA objectives, conclusions and recommendations and our above comments we would expect developments to:
 - Balance other UK marine resources, including recreation with offshore energy resources and ensure safety of navigation is maintained
 - Recognise that AIS is not representative of all vessels and as a result use the RYA Coastal Atlas to identify recreational boating activity
 - Protect coastal navigation by maintaining a 12nm buffer from the coast
 - Recognise that recreational craft avoid shipping (Coastal and international) routes so buffer areas between developments and shipping lanes should be planned in for small craft
 - Maintain a minimum air draft of 22m above MHWS
 - Not exclude recreational vessels from wind farm development areas
 - Take specifications from Trinity House with regard to marking, lighting and visibility of offshore wind farm sites

6 Site specific comments

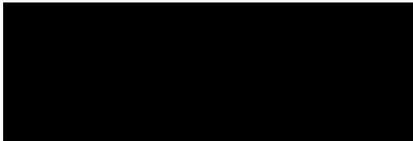
1. Poole Bay: We do not see any part of this zone that could be safely developed. The zone is in a heavily used navigational area with vessels entering the Solent through the Needles Channel and heading towards or from the Eastern entrance to the Solent. In addition, vessels leave the coast at Poole, the Needles and Christchurch for France and the Channel Islands bisecting the zone in several places. High speed cross-channel ferries also cross this area. This area is a good example of recreational craft and commercial vessels being able to stay out of conflict. It is our belief that safety of navigation would be seriously compromised should any area be developed which would be contrary to the SEA objectives. Additionally, over half of the area lies within the 12nm buffer which again is contrary to the SEA recommendations.
2. SE Zone: This zone lies almost entirely within 12nm from the coast, and would appear to be of limited potential for development on the SEA's own recommendations. From the recreational perspective again we can only see limited opportunity for development whilst ensuring navigational safety.
3. East Anglia: There are several routes crossing the North Sea from UK ports to Holland, Belgium and France which should be safeguarded. However, there are parts of the zone that we believe could be safely developed.
4. Lincolnshire coast: The area further offshore can be safely developed in terms of recreational boating, whilst the area closest to the shore is crossed by a number of routes, some of which would be adversely affected due to the existence of proposed Round 2 sites.
5. Scotland: Both of the Scottish sites are crossed by coastal cruising routes which should be preserved. However we see that there may be some scope for development. The SEA should have taken into account the latest proposal from Crown Estate and the Scottish Government as the cumulative effects of the proposals within 12nm from Crown Estate and those in this

SEA outside 12nm. There is a clear need here for integrating the planning for offshore renewables.

6. North West: This zone impinges on the shipping lane as commercial vessels leave the Traffic Separation Scheme and approach Liverpool Bay. This will leave little or no area for recreational vessels that are navigating alongside the TSS and the shipping lane heading for the same destination. The zone is also crossed by numerous routes transiting between Wales, Ireland, England, Scotland and the Isle of Man. There may be some scope for development in such a large zone. Any prospective site must fully examine the recreational and commercial navigation use of the area.
7. Severn Estuary: This site lies almost entirely within the 12nm zone and in a busy navigational area which would be contrary to the SEA's recommendations. The site is crossed by numerous routes. We believe there is limited potential to develop this zone without adversely impacting recreational boating.

Please do not hesitate to contact me if you have any questions or queries arising from our response. On behalf of the RYA, I would be pleased to be involved in any future consultations or discussions. We would welcome early dialogue with all developers looking to exploit any of these areas.

Yours faithfully,



Dr. Susie Tomson
RYA Planning and Environmental Advisor

Encl: RYA's UK Coastal Atlas of Recreational Boating



Offshore Energy SEA Consultation

Response by RWE npower renewables to the Offshore Energy SEA Consultation

1. Introduction

- 1.1 This response is submitted by RWE Npower Renewables Limited (NRL), a subsidiary of RWE Innogy, one of the RWE Group of companies.
- 1.2 From the start of the wind industry in the UK, in the early 1990s, NRL has been a market leader; initially with onshore developments in England and Wales, and later in Scotland.
- 1.3 In November 2003 NRL was the first company to supply electricity to the UK grid from a fully commercial offshore wind farm, the Round 1 North Hoyle project. A second Round 1 project, Rhyl Flats, is currently under construction and due to be completed later this year.
- 1.4 In December 2003 NRL was awarded two Round 2 projects: the 750 MW Gwynt y Môr, and 1,200 MW Triton Knoll offshore wind farms. In November 2008 NRL took the decision to invest in 50% of Greater Gabbard, the first Round 2 project to enter construction.
- 1.5 In total NRL has a UK offshore wind portfolio amounting to 2,350 MW, of which 400 MW is in operation or under construction and 750 MW is consented awaiting construction. In Germany RWE Innogy owns the rights to the 960 MW Innogy Nordsee 1 project, which is currently completing the consenting process.
- 1.6 It is NRL's intention to continue to lead the development of the offshore wind industry with its ambitious plans to develop further offshore wind farms under the Round 3 process.
- 1.7 In August 2008 NRL acquired the development assets of the Atlantic Array project from Farm Energy, who had started to develop the project in 2005.
- 1.8 Building on the legacy of Farm Energy's early predevelopment activity, including an agreement with National Grid to connect 1,500 MW of offshore wind power in October 2014, NRL would like, subject to The Crown Estate (TCE) tender process, to deliver the first Round 3 project in the water within Zone 8 in the Bristol Channel.
- 1.9 In pursuit of this aim NRL has formed the Bristol Channel Zone (BCZ) Alliance to assess the capacity of TCE Zone 8 for offshore wind farm development and to produce the development proposal submitted to TCE on 3 March 2009.
- 1.10 The members of the BCZ Alliance, in addition to NRL are RPS, KBR, SeaRoc and Zero Carbon Marine (Farm Energy successor company).
- 1.11 In March 2009 NRL, together with SSE and Norwegian energy companies Statoil and Statkraft, announced that they had formed a joint venture called Forewind to submit bids to TCE for Round 3 Zones.

- 1.12 In addition to its Round 3 interests NRL in partnership with SeaEnergy was also recently successful in obtaining an exploration licence for the proposed offshore wind farm Inch Cape, as part of the Scottish Territorial waters offshore wind development round.
- 1.13 NRL therefore has extensive interests in developing, constructing and operating future offshore wind farms in UK territorial waters and the Renewable Energy Zone (REZ) both as a sole developer, in partnership with SeaEnergy and as a member of the Forewind consortium.
- 1.14 As Forewind will be submitting a response to the Offshore Energy SEA Consultation, this response focuses on the SEA Environmental Report as it impacts the development of the BCZ, TCE Zone 8. The contents of this response are however equally relevant to our proposed offshore wind farm Inch Cape, which is located within Scottish Territorial Waters.
- 1.15 NRL fully endorses the Government's draft plan for offshore wind energy and supports the intent of the programme to enable further rounds of offshore wind farm leasing in the UK Renewable Energy Zone and the territorial waters of England and Wales with the objective of achieving some 25GW of additional generation capacity by 2020, not including the territorial waters of Scotland.

2 SEA Process and Review of Conclusions

2.1 The Environmental Report of the SEA process was published in January 2009.

2.2 The SEA is intended to:

'Consider the environmental implications of a draft plan for licensing for offshore oil and gas, including gas storage, and leasing for offshore wind. This includes consideration of the implications of alternatives to the plan/programme and the potential spatial interactions with other users of the sea.

Inform the UK Government's decisions on the draft plan/programme.

*Provide routes for public and stakeholder participation in the process.'*¹

2.3 The Environmental Report provides baseline information in relation to each of the zones put forward as part of the Round 3 leasing process. Based on this information, a broad assessment of potentially significant effects on the environment has been undertaken.

2.4 Section 6 of the Environmental Report recommends the following:

'The draft plan/programme for an additional 25GW of offshore wind farm (OWF) generation capacity will require wind farm development on a massive scale. In advance of a formal marine spatial planning system being in place for the UK, the leasing and consenting of OWFs must ensure the minimisation in disruption, economic loss and safety risks to other

¹ Page 1 Section 1.1

users of the sea and the UK as a whole. In particular there should be a presumption against OWF developments which:

- a) impinge on major commercial navigation routes, significantly increase collision risk or cause appreciably longer transit times*
- b) occupy recognised important fishing grounds in coastal or offshore areas (where this would prevent or significantly impede previous activities)*
- c) interfere with civilian aviation including radar systems*
- d) could potentially jeopardise national security for example through interference with radar systems or significant reductions in training areas*
- e) result in significant detriment to tourism, recreation and quality of life.²*

2.5 The Environmental Report recommends that a precautionary approach is taken and in particular recommends a buffer zone for offshore wind farm development of 12 nautical miles (22km) from the coast to minimise the effects on

‘...the relative sensitivity of multiple receptors’³

2.6 The report states that the 12 nautical miles should not be an exclusion zone, as there may be scope for development within this area, and notes that the suitability of a development can only be judged after

‘Detailed site-specific information gathering and stakeholder consultation’.

However, it recommends the buffer zone as:

‘mitigation for the potential effects of development which may result from this draft plan/programme’.

3 Consideration of the SEA Applied Coastal Buffer

3.1 Although the SEA has identified various additional datasets and also provided detail in terms of the regional sea baseline, the baseline information provided in the SEA Environmental Report is in broad agreement with that collated and considered in the work undertaken to date by NRL and also in the MaRS collated by TCE.

3.2 The SEA consistently identifies the coastal buffer as an area which should not be seen as an exclusion zone

‘.....since there may be scope for further offshore wind development within this area, but as mitigation for the potential environmental effects of development which may result from [the] draft plan/programme’.⁴

² Page 213 Section 6.1

³ Page 214 Section 6.1 (4)

⁴ Page 158 Section 5.7.3

- 3.3 However the SEA does in fact treat it as such in identifying the areas of potential development where the coastal buffer zone has been used to remove English and Welsh territorial waters entirely and hard constraints have also been applied to further diminish the available area for development within the UK REZ.⁵
- 3.4 The following sections provide a view on the sensitive receptors and constraints lying within the 12nm ‘buffer’ zone as identified in the SEA in order to provide a clear view on the applicability of this generically applied mitigation measure to illustrate the limitations this imposes on development under Round 3.

4 Coastal navigation routes, port access and safety

- 4.1 The SEA Environmental Report identifies AIS data to inform the spatial mapping of areas of importance for coastal navigation, port access and navigational safety. This is in line with the NRL mapping work undertaken in formulating its project proposals.
- 4.2 However, in the SEA these are augmented with MCA ‘siting not recommended’ areas derived from unpublished (and officially unavailable) OREI 1 primary navigation routes.
- 4.3 The effect of this is to sterilize wide expanses of the sea area around the UK, substantially over and above those areas which can be demonstrated to be heavily used by shipping as derived from the vessel tracking data (AIS).
- 4.4 In contrast the NRL mapping and assessment process based shipping constraints on analysis of vessel densities, thus providing potential for identifying sites for offshore wind farm development within potentially less critical areas for shipping.
- 4.5 TCE’s MaRS based approach appears to support NRL’s assessment process in that the Zones accommodate known shipping routes presumably on the understanding that there was potential for negotiation around the less dense vessel route areas.
- 4.6 Whilst shipping density is cited within the SEA as playing a role in the determination of constraint areas, the default position seems very much in line with the MCA’s ‘clearways’ approach.
- 4.7 If taken at face value, the approach taken by the SEA eliminates much of the sea area within 7 out of the 9 Round 3 zones identified by TCE.
- 4.8 The need to apply a buffer zone of 12nm to the coast to protect navigational routes, lanes, port access or even navigational safety seems out of line with the measures already in place in the assessment of project location, and historical practice and due processes, already undertaken in consenting Round 1 and Round 2 offshore wind farms.
- 4.9 Close liaison with the MCA, Trinity House and the Chamber of Shipping through the established Nautical and Offshore Renewables Energy Liaison (NOREL) Group, provides a forum for marine industries and Government to discuss matters of mutual interest related to navigational safety.

⁵ Page 154 Fig 5.24

- 4.10 This, coupled with formal Navigation Risk Assessments (NRA's) that assess the implications for actual vessel usage of sea areas obtained through AIS data and site-specific surveys (including smaller vessels), provides the appropriate level of rigour in considering the likely effects of siting a wind farm in a given sea area. Indeed the Environmental report states in Section 5.7.4. 'Navigational Risk Assessment' that *'The SEA judgement is that sufficient regulatory control exists, at the consenting and operational stages to manage navigational safety risk effectively'*.
- 4.11 If the closest to shore routes and navigational areas need to be protected by employing a blanket measure, it is considered likely that these would have been sufficiently protected utilising a smaller buffer area, more in line with the 13km zone used in both NRL's and TCE's mapping exercises.

5 Inshore fisheries

- 5.1 Fishing activity is one of the key spatial issues identified in the SEA for consideration within the context of offshore energy developments.
- 5.2 Almost all areas of UK waters are subject to some degree of fishing, much of which is focused on specific areas either as a result of targeting specific species/seabed types, or through a reliance on accessibility, the latter being of most importance for smaller inshore vessels of limited range. Such inshore vessels are identified as being the most sensitive to displacement etc. impacts from OWF developments.
- 5.3 The principal mitigation measure applied within the SEA for avoiding or minimizing conflict with fishing interests is the application of the 12nm coastal buffer.
- 5.4 However it is notable that many areas outside the 12nm mark are also recognised as being subject to UK and international fishing effort. It is further recognised that even within the 12nm zone there are areas of less intensive activity but these may still comprise areas of great local significance, which should also therefore be avoided by OWF development.
- 5.5 Whilst the protection of the interests of inshore fisheries is obviously important to consider, particularly for smaller vessels of limited range, the majority of such vessels would be anticipated to fish much closer to shore than the 12nm limit.
- 5.6 A coastal buffer may well serve to minimise conflict and substantially mitigate displacement effects on the most vulnerable (smallest) vessels, however fisheries liaison, conducted in-line with guidance published by FLOWW⁶ will provide the most appropriate level of site-specific assessment.
- 5.7 This could be augmented by applying a buffer zone specifically targeted at protection of the most vulnerable vessels, i.e. inshore waters within 8-13km, which would sit well with the jurisdiction of the sea fisheries committees areas (within 6nm).

⁶ Fishing Liaison with Offshore Wind and Wet renewables group (FLOWW)

- 5.8 Overall, it is suggested that the potential importance of areas for both fishing and energy industries would suitably be negotiated during the feasibility and pre-development phase, rather than being provided for by applying a blanket (effectively exclusion zone) measure.

6 Aviation aerodrome safety, civilian and military radar interference

- 6.1 As stated in Appendix A3h.3 of the SEA Environmental Report, offshore wind farms have the potential to affect aerodromes and both civilian and military radar systems, and certain civilian and military aerodromes and technical sites are officially safeguarded to ensure that their operation is not compromised by developments such as wind farms.
- 6.2 From safeguarding maps presented in the SEA report, buffer zones around civilian sites include:
- a 15km buffer indicating the height above ground level for which any proposed development must be consulted upon; and
 - a 30km buffer delineating the area within which a local planning authority is required to consult with the relevant aerodrome regarding any wind turbine proposal.
- 6.3 The provision for military sites is conducted on a site-by-site basis.
- 6.4 Further to these provisions for aerodrome sites, there is also information from NATS En-Route Ltd (NERL) presented showing the likelihood of interference from wind turbines on its radar network for a range of turbine tip heights (from 20-140m).
- 6.5 There is additional mention made of extending this height to 200m to accommodate the larger turbines likely to be deployed in Round 3 projects. Although these maps are not provided in the Environmental Report or its annexes, the commentary suggests that the areas of interference are extended line-of-sight by some 10km when the tip height is increased from 140 to 200m.
- 6.6 The application of the 12nm buffer zone to provide for mitigating sectoral conflicts in this instance is again questionable.
- 6.7 Firstly, the buffer zone would negate the potential development of areas within several TCE zones, including the Bristol Channel, which are clearly outwith any consultation buffer areas from any known installations or sites in the region as illustrated by the safeguarding maps presented in the SEA; and secondly, there is a range of activity ongoing which is attempting to mitigate wind turbine effects on radar coverage which may provide for development in areas currently subject to potential conflict between the two sectors.⁷
- 6.8 Clearly, the role of consultation in determining acceptable locations for offshore wind farm siting is the most appropriate route to minimising conflict and thus constraint on the activities of either sector.
- 6.9 Indeed, the SEA Environmental Report states this quite clearly

⁷ For example NATS (2008). Mitigating the effects of wind turbines on NATS En-Route Ltd (NERL) operations. Unpublished report, 13pp.

*‘Detailed site-specific information gathering and stakeholder consultation is required before the acceptability of specific major Round 3 or subsequent wind farm projects close to the coast can be assessed’.*⁸

- 6.10 A generically applied buffer zone mitigation measure uniformly extending 12nm from the coast would therefore seem to be an inappropriate measure in terms of safeguarding aviation interests.

7 Coastal PEXA danger areas (using Bristol Channel Zone as an example)

- 7.1 The SEA Environmental Report recognises the widespread military use of the coasts and seas of the UK and the Bristol Channel is no exception, with extensive defined danger areas (army) in proximity to the BCZ off south Pembrokeshire (Castlemartin and Manorbier) and Camarthen Bay (Pendine and Pembrey).
- 7.2 It is important to note, however, that the PEXA danger areas defined already offer a safety ‘buffer’ around the actual firing range activity and as such the areas indicated on the mapping presented in the SEA report require no further exclusion zone to be established around their boundaries.
- 7.3 It is equally important to note that the BCZ, although close, does not show any overlap with these areas at any point.
- 7.4 On this basis, and notwithstanding project specific consultation with MoD, the selection by TCE of the BCZ perimeter already provides for avoidance of any conflict with military activities in this area. As such, there is little to be gained from applying the coastal buffer zone and it is therefore considered inappropriate to do so in relation to military areas.

8 Recreational and racing yachting, boating and coastal tourism

- 8.1 In general, tourism, recreation and quality of life are difficult to quantify with any degree of certainty since:
- tourism effects, in most cases of already built wind farms, are difficult to discern, if any;
 - the recreation value of any particular offshore site is not always known to any greater level of detail than the sailing areas as provided by the Royal Yachting Association. This is further complicated by the fact that recreational sailing is allowed within offshore wind farms and that the overall effect on recreation is very difficult to quantify; and
 - as with the above factors, ‘quality of life’ is similarly difficult to quantify, either positively or negatively.
- 8.2 As the SEA has recommended a presumption against offshore wind farm developments which *‘result in significant detriment to tourism, recreation and quality of life’*⁹, it is imperative that the factors which result in ‘significant

⁸ Page 214 Section 6.1 (4)

⁹ Page 213 Section 6.1 (2e)

detriment’ are spelled out in terms of the provision of an objective method of assessment.

- 8.3 Despite the many Public Inquiries in the last 15 years into onshore wind farms in the UK, no such method has emerged to allow the assessment of detriment to tourism, recreation and quality of life by onshore wind farms. It is therefore reasonable to assume that no such method will emerge in the future for offshore wind farms.
- 8.4 In the Environmental Report, it is stated that ‘*conflicts with recreational activities are expected to be substantially mitigated by a coastal buffer zone*’.¹⁰
- 8.5 The exclusion of OWF development within the 12nm area would indeed provide for safeguarding of recreational activities around the UK coastline, but the area so protected is significantly greater than that subject to high recreational use.
- 8.6 The focus of coastal tourism interests lies in the close inshore area generally, although it is acknowledged that some extend this area of interest further offshore, for example scenic value, sailing, racing, motor boating and angling activities, but still well within a few miles of the coast.
- 8.7 The provision of a buffer zone to protect these activities and maintain the important economic benefits provided by an active tourism industry is acceptable in principle; it is the spatial extent of such a zone which is questionable.
- 8.8 A buffer zone, if any is to be applied, extending to some 8-13km as has been employed previously would seem to provide for appropriate levels of protection for the high-usage areas and it seems likely that extending this area to 12nm from shore will do little to increase this level of safeguarding.

9 Landscape/Seascape

- 9.1 The Environmental Report states that the suitability of development can only be judged after ‘*detailed site-specific information gathering and stakeholder consultation*’.¹¹
- 9.2 Furthermore, the Landscape Institute and Institute of Environmental Management and Assessment guidance set out in the Guidelines for Landscape and Visual Impact Assessment 2002 (GLVIA) requires that site specific sensitivity be taken into account in locating development:

‘Landscapes vary in their capacity to accommodate different forms of development. Sensitivity is thus not absolute but is likely to vary according to the existing landscape, the nature of the proposed development and the type of change being considered. Sensitivity is not therefore part of the landscape baseline, but is considered during the assessment of effects.’ (para 2.28).
- 9.3 On this basis, the appropriate distance for wind farm development from the coast will vary dependant on site specific conditions. In addition to the nature

¹⁰ Page 156 (4th bullet) Section 5.7.2

¹¹ Page 214 Section 6.1 (4)

of the site, the potential environmental effects will be dependant on the nature of the proposed development.

- 9.4 Section 5.6.1.3 of the Environmental Report deals with experience from previous wind farm studies. This section illustrates the range of distances at which effects may arise from offshore wind farm development.
- 9.5 No particular distance emerges from this section as a clear threshold of significance, although the report notes that DTI (2005) guidance indicates that the limit of any significant effect in areas of moderate sensitivity can be considered at a distance of 30-35km offshore.
- 9.6 The information presented in this section of the Environmental Report does not include the consented London Array offshore wind farm. The turbines proposed for this project were 155-180m in height located at 20.5-22.5 km from the coast and the predicted significance of landscape and visual effect varied from negligible to slight. The closest nationally designated landscape (the Suffolk Coasts and Heaths AONB) lies 24km from the London Array scheme. Locally designated areas e.g. Special Landscape Areas were closer, as were lengths of Heritage Coast, which are a non-statutory designation. However, the impact on all these landscapes was considered to be negligible, and this was not disputed during the consenting process.
- 9.7 The closest turbine of the Gwynt y Môr offshore wind farm is 12.7km from the coast. The ES and SEI for this project considered the 'worst case scenario' of 5MW turbines of approximately 161m to blade tip. The significance of effects ranged from insignificant to moderate/substantial. The latter effect was for one viewpoint only (not a designated landscape/townscape). The significance of effect from the Anglesey AONB and the Clwydian Range AONB was considered to be slight.
- 9.8 In the application of a buffer zone, the Environmental Report does not acknowledge that turbine height, together with distance from the shore, will also play a role in the likely significance of visual effect.
- 9.9 The Environmental Report acknowledges that development scenarios will vary for each individual wind farm
- '...though the principal factors affecting visibility other than distance from the coast are lighting, turbine arrangement and individual turbine size'.¹²*
- 9.10 Despite this acknowledgement that the nature of the scheme, including turbine number, arrangement and size will affect the likely effects of the scheme, the report proposes a universal 12nm buffer applicable to all of the Round 3 zones.

Consideration of a Buffer Zone

- 9.11 In considering the need for a coastal buffer, Section 5.7.3 of the Environmental Report refers to Planning Policy Guidance 20: Coastal Planning (PPG 20). It should be noted that PPG 20 is not applicable below Mean Low Water (MLW) and relates to development located on the coast only. It is not therefore strictly applicable to consideration of a buffer within the marine environment for offshore development.

¹² Page 130 Section 5.6.1.3

9.12 Similarly this section of the Environmental Report refers to Planning Policy Statement 22: Renewable Energy (PPS 22). PPS 22 explicitly states that

‘As the land use planning system does not extend offshore, the policies do not apply to developments for offshore renewables.’

9.13 Even if it was applicable, the PPS is clear that

‘Regional planning bodies and local planning authorities should not create ‘buffer zones’ around international or nationally designated areas and apply policies to these zones that prevent the development of renewable energy projects’ (paragraph 14).

9.14 A site specific approach is supported by the GLVIA which also states that

‘The test is whether the integrity of the landscape and objectives of designation are compromised or not’ (paragraph 7.43).

9.15 As recognised within the Environmental Report, the Marine and Coastal Access Bill will introduce a new marine planning system, including the creation of more detailed local marine plans. If individual buffer zones were to be adopted on a local, site specific basis, it should be the role of this legislation rather than the SEA process.

Other Considerations

9.16 The Guide to Best Practice in Seascape Assessment (Countryside Council for Wales *et al* 2001) explains that seascape consists of three components:

- The coastal dimension;
- The marine component (national, regional and local units);
- The hinterland component.

9.17 The guidance notes that a local unit of the marine component may be affected significantly by a proposal, but that in many cases the regional and national units containing this local unit would not. Similarly the coastal dimension could be affected significantly, but when taken as a whole, the unit may not be significantly affected. It is concluded that a development should not be ruled out simply because it affects one part or dimension of a landscape or seascape.

9.18 Additional considerations in determining any distance at which a proposed development would be visible include the acuity of the human eye and meteorological conditions.

9.19 Section 5.6.1.1 of the Environmental Report mentions the acuity of the eye but does not give any details.

9.20 The Guide to Best Practice in Seascape Assessment discusses the limitations of the acuity of the human eye. This guidance states that:

‘At a distance of 1 kilometre in conditions of good visibility a pole of 100mm diameter will become difficult to see, and at 2 kilometres a pole of 200mm diameter will similarly be difficult to see. In other words there will be a point where an object whilst still theoretically visible will

*become too small for the human eye to resolve. Mist, haze or other atmospheric conditions may significantly exacerbate that difficulty.*¹³

Consequently, when visible in favourable conditions, a slim object approximately 3m in width will be at the limit of perception by the human eye at a distance of 30km.

- 9.21 The Environmental Report also notes that the DTI recommend using Met Office data to assess trends in weather conditions over ten year periods. It notes that such conditions will

*‘...greatly affect how far can be seen,....’*¹⁴

but the report has not taken into account such data or visual acuity in its calculation of the proposed buffer zone.

- 9.22 With specific reference to the BCZ, section 5.6.6.6 of the Environmental Report describes the landscape of the coasts on either side of the Bristol Channel Zone:

‘The Bristol Channel has surrounding coasts in England and Wales. Landscape value here is recognised in the: Hartland, Lundy, North Devon, Exmoor, Glamorgan, Gower and South Pembrokeshire Heritage Coasts: North Devon and Gower AONBs and the Exmoor and Pembrokeshire Coast National Parks. Unlike most areas the Bristol Channel is viewable from almost all sides from high cliffed coasts. Large developments may interfere with views across the Bristol Channel and down the Severn, where turbines would be silhouetted against sunsets. Views from Devon and Cornwall to Lundy Island may be compromised by developments in the offshore parts of this area, and the rural undeveloped and often secluded nature of much of the coast in this region may clash with the industrial character of turbines.

- 9.23 Notwithstanding the use of pejorative language such as ‘the industrial character of turbines’, the assessment of effects on character provided in this section is harsh, seemingly definitive, and perhaps biased, given the position taken in other parts of the landscape/seascape section of the Environmental Report.

- 9.24 By comparison, the Hastings Zone, at its closest point, lies approximately 13.5km from the Sussex Downs AONB and the South Downs National Park but the Environmental Report indicates

*‘low to moderate impacts from the developments with 5MW turbines between 13 and 24km offshore’*¹⁵

despite the high cliffs and consequent increase in viewable distance for an offshore wind farm proposal in this area.

- 9.25 The detailed study of both the Welsh and Scottish seascape units and the lack of a similar study of English units have resulted in a more detailed analysis of the potential effects of an offshore wind farm on Wales and Scotland.

- 9.26 Table 5.12 within Section 5.6.6.6 of the Environmental Report outlines the sensitivity of the Welsh seascape areas to

¹³ Page 8 Section 2.4

¹⁴ Page 129 Section 5.6.1.2

¹⁵ Page 140 Section 5.6.6.4

‘a wind farm development scenario of many parallel turbines (160m to blade tip) at 550m intervals, 13km from the shore’.

- 9.27 The calculations are for Wales only, as England has no seascape assessment, thus giving an unequal view of the effect on the landscapes/seascapes and this is reflected in comment made in the Severn Barrage landscape and seascape topic paper on the DECC website, which states

“Limitations in establishing the baseline landscape/seascape character could arise through inconsistencies in approach in the published assessments and tranquillity mapping in England and Wales. Therefore it will be necessary to develop criteria to evaluate these in consultation with the relevant authorities prior to undertaking detailed studies. Public perception/values of the existing seascape and estuarine character are not fully understood and further assessment is suggested.”

- 9.28 Clearly the coastal area of the Bristol Channel varies in character and quality and so it is difficult to see how a rigid buffer zone could ever be appropriate.

- 9.29 It should be noted that Table 5.12 of the Environmental Report assesses the sensitivity of the seascape character areas

‘Based on a wind farm scenario of many parallel [rows of] turbines (160m to blade tip) at 550m intervals, 13km from the shore’

- 9.30 However the ‘buffer’ zone is drawn at 22km (12nm). There has been no assessment of the effects of turbines 13km-22km from the shore. The conclusion to recommend a 12nm buffer zone is therefore not based on any evidence that such an exclusion zone would provide any definable benefits.

10 Seabirds and waterbirds

- 10.1 The SEA applies the coastal buffer, within which major wind farm development would not normally occur, in recognition

*‘that a large proportion of the bird sensitivities identified are concentrated in coastal waters’.*¹⁶

- 10.2 Whilst it is accepted that this assumption may be valid, the assessment of impact on bird interests arising from offshore wind farm developments is routinely undertaken to ensure that sufficient protection of feeding, roosting, foraging, breeding areas and migration routes are provided for in the final selection of a development site. Furthermore, the layout of any wind farm is also designed in recognition of the need to provide for protection of sensitive receptors such as important bird areas.

- 10.3 The current Round 3 process provides for a more holistic strategy in assessing potential effect on birds through the zonal approach to leasing and development, allowing assessment of environmental sensitivities in the selection of specific sites within a wider, sub-regional context.

¹⁶ Page 127 Section 5.5.5

- 10.4 This in turn allows more scope for selection of appropriate sites for individual wind farm projects and provides the mechanism for evaluating cumulative or in-combination effects arising from multiple projects within a region (zone).
- 10.5 NRL supports the requirement for collection of detailed environmental baseline information to inform assessment. In respect of birds, this extends to some 2 years of data being viewed as necessary for the purposes of robust impact assessment.
- 10.6 A key benefit of assessing projects on the basis of such detailed and relatively long-term data is that an in-depth consideration of potential effects, both positive and adverse, is made with specific reference to the site itself, thus avoiding the need for blanket measures to offer protection against impacts on a receptor.
- 10.7 Applying an expansive buffer zone does not automatically provide for protection at the site-specific scale and leads to unnecessary sterilization of potential projects and resource areas.
- 10.8 On the basis of the accepted requirement to collect a comprehensive baseline dataset to inform assessment, it is therefore considered appropriate to deal with individual zones and the location of wind farm sites within the zone on a case by case basis.
- 10.9 Applying a catch-all mitigation measure which serves to reduce the potential of zones such as the BCZ, which is likely to be one of the first projects delivered under Round 3, seems counter-intuitive when the appropriate assessment will be conducted on the specific conditions and qualities of the zone itself.

11 Natura 2000 sites

- 11.1 The BCZ lies in proximity to a number of European designated sites and clearly assessment will be needed in terms of the development projects undertaken in this area and the potential effects arising from these on features, species and ecosystem functioning of the designated sites.
- 11.2 Such sites are selected on the basis of the occurrence of listed features or species and are focused on offering a higher level of protection in order to conserve important or uncommon habitats and species.
- 11.3 As acknowledged in the SEA Environmental Report, such importance or sensitivity is not uniformly distributed around the UK coastline and this is reflected in the selection of specific sites at which this highest level of protection is afforded.
- 11.4 It would therefore be incorrect to establish a buffer zone extending around the entire coastline to provide for the avoidance of impacts at such sites, when the sensitivity to impact of the designated features or species is determined by reference to those occurring at the site level.
- 11.5 This is, then, a further example of the role of site-specific evaluation rather than a ubiquitous mitigation measure to be applied for the offshore energy plan/programme, particularly when the site-specific sensitivities need to be considered in establishing the acceptability of a project in a given area in order to offer protection and develop targeted mitigation against adverse effect.

- 11.6 The provision of such detailed assessment is in any case established under statute through the Conservation (Natural Habitats, &c.) Regulations 1994. Where a plan or project, either alone or in combination with other plans or projects, is likely to have a significant effect on a European Site, (i.e. on internationally important habitats and/or species), and is not directly connected with the management of the site for nature conservation, the developer is required to provide the Competent Authority with information to undertake a test of likely significance and potentially an Appropriate Assessment, under these regulations.
- 11.7 NRL considers this system of assessment far more effective than the application of a 12nm buffer zone (which does little to protect proposed offshore SACs), both in terms of offering protection to features of conservation interest and in the avoidance of unnecessary sterilization of potentially viable resource areas.

12 Potential for wet renewable energy generation

- 12.1 The BCZ, located within the Bristol Channel/Severn Estuary area, represents a region well documented in offering potential for future wave, tidal stream and tidal range energy projects.
- 12.2 The need for potential safeguarding of wave and tidal resource areas around the UK coastline is recognised in order to provide for a future renewable energy sector to be established on a commercial scale.
- 12.3 However with reference to the DTI (now DECC) renewable energy atlas work, the principal areas of tidal resource of relevance to the Bristol Channel area lie close inshore immediately off the headlands of Pembrokeshire and North Devon and further to the east of the BCZ within the inner Bristol Channel/Severn Estuary area.
- 12.4 Although the potential effects of the establishment of offshore wind farms within the BCZ will be subject to evaluation through modelling to inform assessment, it is unlikely that any significant alteration in tidal stream or range will accrue from the development of BCZ as the turbines themselves will not form any coherent barrier to tidal flows within the regional system.
- 12.5 On this basis it is logical to surmise that any potential projects, notably including the Severn barrage or tidal lagoon proposals, would be unlikely to be affected by wind farm development within the BCZ.
- 12.6 The BCZ does fall within a relatively promising area of wave resource; however the potential for wave devices remains unaffected by the development of wind farms in the zone. In fact the presence of the wind farms, with their strong connections to the National Grid, could dramatically improve the economic viability of a wave farm in the deeper water to the west of the BCZ
- 12.7 Overall, whilst the safeguarding of potential wet-renewable resource areas is an acceptable measure and indeed one perhaps to be encouraged, the application of the 'catch-all' 12nm buffer zone artificially sterilizes vast areas of coastal waters, only a small proportion of which are economically viable for wet renewable developments.

- 12.8 A more sensible measure would be to safeguard specific areas for, particularly for tidal power generation, thus leaving areas with sufficient wind resource available for suitable OWF development, a proven technology that has commercial scale application that will deliver the majority of the renewable energy targets committed to by Government within appropriate timescales.

13 The 12nm coastal buffer

- 13.1 A principal justification of the application of the 12nm buffer within the SEA Environmental Report seems to be that even with its application and that of the hard constraints it is still possible to exceed the targeted 25GW capacity delivered by Round 3, citing a potential capacity of 80GW.
- 13.2 It is worth noting that this is based on some 59% of the total (using the 80GW figure) being delivered from the Southern North Sea, with the lion's share of this within TCE Zone 3, the Dogger Bank.
- 13.3 However the overdependence of the draft plan/programme on the development of offshore wind farms over such a large proportion of the Dogger Bank area seems at odds with the potential restrictions which are likely to constrain development since the area is a draft SAC.
- 13.4 The achievement of a positive outcome of an Appropriate Assessment (AA) of developments in this zone would seem likely to be subject to a demonstrably limited zone of effect, on habitats, species and ecosystem function. In NRL's experience of undertaking studies to support AAs, this is generally only achievable on the basis of a minor proportion of the total area being affected.
- 13.5 Figures 5.22 - 5.24 in the Environmental Report¹⁷ appear to indicate that the Dogger Bank Zone is developed in its entirety. The affected area within this zone would therefore be substantial and thus unlikely to provide for an assessment conclusion of *de minimis* effect, even assuming the effect from individual turbines *per se* is minimal; cumulatively the impact may be seen as significant.
- 13.6 With the probability of constrained development within the Dogger /Bank zone and the evidence from Figures 5.22 - 5.24 indicating that much of the unconstrained wind resource areas lie outside the 9 TCE development zones, it is questionable whether the 25GW by 2020 target for Round 3 is achievable within the 6 TCE zones that would remain after applying the 12nm coastal buffer.
- 13.7 The SEA Environmental Report references the Carbon Trust study which

'...used the spatial constraint criteria and GIS developed for the DECC Offshore Energy SEA to determine the area of seafloor available for offshore wind farm development and to analyse the costs and risks associated with different sites.

Economically, the most attractive sites are those that are near-shore with shallow water and mid-distance, mid depth sites with higher wind speeds. However, the effect of applying all of the constraints (including for example offshore Natura 2000 sites), would be to restrict development

¹⁷ Pages 152 - 154

*sites for offshore wind farms to the most expensive site types such as north of the Dogger Bank. In order to locate all of the 25GW of capacity on the most economically attractive sites the study suggests that a seaward buffer zone would need to be reduced in some places and some constraints (including those that are currently considered 'hard' or 'fixed') would need to be relaxed, especially the 6nm exclusion zone around oil and gas installations.'*¹⁸

- 13.8 It seems that, having used exactly the same constraint criteria and GIS employed by the Carbon Trust in their report, the SEA concludes that rather than relaxing the seaward buffer zone of 7nm used in the Carbon Trust report, it should be increased to 12nm.
- 13.9 Unfortunately there seems to be no consideration of the economic consequences of applying this recommendation.
- 13.10 In practice, as is clearly shown in Figure 5.24 of the Environmental Report, the application of hard constraints, including 6nm exclusion areas around existing oil and gas installations and a 12nm coastal buffer reduces the majority of the remaining available offshore wind resource to far offshore sites, which normally also means deeper water.
- 13.11 The consequences of applying these constraints to all UK territorial waters and the REZ would be to remove all of the economically attractive sites for offshore wind turbines; including the 6.5 GW of sites awarded exclusive development agreements in Scottish territorial waters by TCE in February.
- 13.12 It would also eliminate all of the near term opportunities for early development of Round 3 projects which are all located in TCE zones 6, 7 and 8 where the sites are closer to shore and can connect into the existing National Grid transmission system, without the need for extensive grid reinforcement.
- 13.13 This would have significant implications for DECC's target of achieving 25GW of additional offshore wind generation capacity by 2020 and the UK's ability to meet the 15% target set for primary energy production from renewables under the European Directive.
- 13.14 Overall, NRL do not consider it appropriate for the Environmental Report to set a broad buffer zone around the UK in relation to future Round 3 wind farm development.
- 13.15 Although specifically stated as not representing an exclusion zone, the adoption of a set distance from the shore within this document is likely to encourage the use of this figure in future during consultation and the determination of consents for offshore wind farm projects.
- 13.16 This is considered to be wholly inappropriate taking into account the following:
- The suitability of development in any given location is site specific and therefore can only be judged based on detailed and site specific information and consultation. This is stated within the Environmental Report itself (Section 6.1 (4)).

¹⁸ Page 156 Section 5.7.2

- The suitability of development is dependant on the nature of the proposed development (such as turbine height, number and layout within a zone) and therefore will not be constant for a given distance from the shore.
- Any future zoning of the coastal/marine environment should be the focus of appropriate legislation and planning policy, such as that associated with the Marine and Coastal Access Bill rather than forming part of the Environmental Report.

13.17 The proposed buffer zone does not take into account the fact that development in closer proximity to the coast may be acceptable, particularly taking into account mitigation strategies such as careful consideration of the number, arrangement and height of turbines.

13.18 Section 3.7 of the Environmental Report begins:

‘The assessment is presented as evidence based discussion....’

NRL considers that insufficient evidence is presented within the report to justify the recommendation for the 12nm to be adopted. Indeed the justification seems to rely almost exclusively on frequent repetition of the phrase

‘Reflecting the relative sensitivity of multiple receptors in coastal waters...’¹⁹

13.19 The application of a buffer zone may be a useful tool in safeguarding interests and, with respect to visual intrusion, on the basis of expressing a distance beyond which no visual effects are likely. However, the use of a blanket buffer zone to determine areas that should not be used for development of offshore wind farms without taking into account the nature of the site or the proposed development is not considered to be helpful and is therefore inappropriate.

14 Conclusion

14.1 The Environmental Report sets out the Code of Practice on Consultation - the Seven Consultation Criteria. Criterion 3 - Clarity of scope and impact states:

‘Consultation documents should be clear about the consultation process, what is being proposed, the scope to influence and the expected costs and benefits of the proposals.’²⁰

14.2 NRL believes that the Environmental Report falls short of achieving this criterion.

14.3 Discussion of the benefits of the draft plan/programme is limited to a brief acknowledgement that:

‘Making efficient use of the UK’s own energy reserves brings obvious benefits both in the contribution it can make to a diverse UK energy mix and to the economy in terms of jobs, investment and national income generated by the sector.’²¹

This comment refers to the entire plan/ programme including offshore wind, oil and gas and gas storage.

¹⁹ Page xx Executive Summary; Page 155 Section 5.5.5; Page 186 Section 5.7.3; Page 242 Section 6.1 (4)

²⁰ Page 7 Section 1.5

²¹ Page 37 Section 2.1

- 14.4 Apart from references to relevant legislation there is no in-depth assessment of the economic, social or environmental benefits of developing offshore wind energy on the scale envisaged by the draft plan/ programme. There is no discussion of the likely consequences of not achieving the deployment proposed by the draft plan/ programme.
- 14.5 The discussion of costs (economic, social and environmental) is limited to the brief reference to the Carbon Trust work.
- 14.6 In setting out the SEA objectives under the topic ‘Other users of the sea, material assets (infrastructure and natural resources)’ the report states:
- ‘Balances other United Kingdom resources and activities of economic, safety, security and amenity value including defence, shipping, fishing, aviation, aggregate extraction, dredging, tourism and recreation against the need to develop offshore energy resources.’²²*
- 14.7 In Section 5 - Assessment, which forms the bulk of the Environmental Report, it is difficult to see where, if anywhere, this balancing exercise is applied.
- 14.8 Rather than balancing the relative benefits and costs of developing offshore wind resources against the existing marine interests, the Environmental Report adopts a precautionary approach whereby existing activities and interests automatically take precedence over the development of offshore wind projects.
- 14.9 Ultimately it is this approach that drives the assertion
- ‘Reflecting the relative sensitivity of multiple receptors in coastal waters...’*
- which in turn leads to the recommendation of the 12nm coastal buffer zone.
- 14.10 In conclusion, the need for renewable energy developments must be noted and balanced against other marine activities and interests. The commitment of the UK to achieve percentages of energy production from renewable sources is set out in legislation at a European level (2001/77/EC Renewable Directive) and in national legislation and policy (Energy White Paper, Energy Act 2004).
- 14.11 The BCZ benefits from a range of pre-development feasibility work undertaken over several years, initially by Farm Energy and more recently by the BCZ Alliance assembled by NRL.
- 14.12 NRL views wind farm development in the BCZ region as representing a crucial ‘stepping stone’ project, bridging the gap between the existing near shore Round 1 and 2 projects and the bulk of the current Round 3 initiative that lies further offshore.
- 14.13 The potential for early delivery of projects in this region has an important contribution to make, therefore, in addressing both the need for renewable energy production and the achievement of renewable energy targets to which UK Government is committed and legally bound.
- 14.14 Without development in the BCZ and the two south coast zones, all of which are threatened by the 12nm coastal buffer recommendation, NRL believes that the

²² Page 35 Section 3.5

net cost of achieving the Government's Round 3 ambition will be greater and the delivery period will inevitably need to be extended.

Name Sandor Gera

Address

Chatham

Topic General

The United Kingdom undertook an obligation to satisfy 20% of her energy needs from renewable sources by the year 2020.

How much is this 20%?

First, a few words about our widely known and used energy sources:

1. Conventional, non-renewable sources:
 - a. Coal-fuelled power plants
 - b. Gas and oil fuelled power plants
2. Non-conventional, non-renewable sources:
 - a. Nuclear energy
 - b. Thermal energy

The reserves are vast and with technological advances the production of energy is becoming safer, cheaper, and more efficient.

3. Conventional, renewable sources:
 - a. Water-powered plants on rivers
4. So-called "renewable" energy sources
 - a. solar power plants
 - b. wind power farms
 - c. wave powered plants
 - d. sea tide-powered plants

Based mainly on direct solar power or its secondary effects, and the gravitational effect of the Moon in the case of tide-powered plants.

5. Produced energy sources:
 - a. bio mass, gas-based plants
 - b. alcohol-based plants

The disadvantage here is that it requires land at the expense of food production, which land is greatly needed by the intensively growing world population.

A common characteristic of the energy sources under points 1, 2, 3 and 5 from the perspective of energy production is:

"The power plants are able to provide consistent and continuous electric power that users can rely on in the long term.

Although the renewable energy sources cause less pollution, they renew daily, and never run out, they have one inevitable (but not insurmountable) disadvantage: UNCERTAINTY. Meaning that the sun does not always shine or the wind does not always blow as and when we actually need it.

- The demand for power (consumption) cannot tolerate the idea that it can use power only when the sun shines or the wind blows with the required force, etc.
- Another problem is that the rhythm of usage of energy (mainly during the day) does not correspond with the rhythm of production of energy – if the wind does not blow or the sun does not shine, etc.
- (Example from everyday life: electricity during the night is cheaper and its use is subsidized by governments.)

Based on the laws of large numbers, statistical data show us:

- the annual average number of sunny days
- the annual average number of windy days at a minimum wind force
- the annual average number of hours of strong wave activity
- the energy generated by tide power can also be calculated precisely.

On an annual basis these data are accurate, in fact the amount of energy produced will be very close to the anticipated output, yet experiences in Germany tell us that “with a good estimate it is only one fifth of the nominal capacity that we can surely rely on on a continuous basis.” Increasing our capacities to fivefold is such a luxury that no nation can afford thus it is important to understand the basic problems of the issue.

Uncertainty presents itself in the facts that the possibilities of energy production and the rhythm of the demand for energy (mainly the use during the day) do not always meet and reconciling these two factors is a serious challenge. The difficulties are lessened by the existence of internationally interconnected electric networks that enable us to transport energy where it is needed (since the wind always blows somewhere), but this is clearly not the proper solution.

The core problems are:

- Reducing the difference between the nominal capacity and the amount of energy generated by the sunshine, the wind or the waves that can actually be harnessed.
- Storage of energy, adjusting to the patterns of demand, i.e. the accumulation of energy from night time to day time, from the time of production to the time of usage.

The solutions necessary for the operation at near nominal capacity levels will be provided by the technological improvements.

As far as the accumulation and storage of energy are concerned high level water reserves have been long known and utilized to store energy in the form of potential energy of the water. Fortunately, the United Kingdom (UK) is rich in geographical locations where these reserves can be constructed at a low cost.

We are witnessing the birth of a new industry and the opportunities of new, high-return investments are knocking on the door. The sector of energy storage will play a key role in the efforts to harmonise the supply and the demand for energy.

This area of investment or industry is so fresh that investors have not yet set their scouting eyes on it.

It is high time to address this issue in order to effectively support the cause of renewable energy.

With the costs of production of energy via conventional methods increasing, renewable energy sources are receiving more and more attention and they are becoming ever more competitive. Moreover, let us not forget the fact that countries disposing of conventional energy sources will not hesitate to utilize this advantage of theirs in their political interests against countries which rely on coal, gas and oil imports.

We must act...

Sándor Gera

Water engineer
General contractor

SAVE OUR SEAS (SOS)

Consultation Response

UK Offshore Energy Strategic Environmental Assessment

Environmental Report

April 2009

SOS

SOS is a campaign group concerned to respond to threats to the environment of Cardigan Bay and in particular potential damage to wildlife in the area. It seeks to identify threats to this environment, to raise awareness of the nature and extent of these, and to campaign to ensure that unnecessary damage is not created by industrial or other initiatives. Cardigan Bay SOS has the additional purpose of identifying environmental threats in the area and responding to these where there is the potential for damage to sustainable tourism, an important feature of the local economy. The group is particularly concerned to protect the integrity of the marine Special Areas of Conservation (SACs) in Cardigan Bay, and the important designated species that these areas are intended to protect. Cardigan Bay SOS is an independent voluntary group with no external funding, or formal association with any industry, government or other organisation.

SOS Contact

Chairperson : Lorraine Hill
Contact for : David Grimsell
consultation
response
Telephone: 01570 470242
Email: d.grimsell@talk21.com
Website: www.savecardiganbay.org.uk

Summary of SOS consultation response

SOS is responding specifically concerning aspects of the SEA Environmental Report which relate to impacts of anthropogenic noise on marine mammals. SOS notes the following :

- The report adopts an overly narrow interpretation of what may constitute a biologically significant effect of noise impacts. This interpretation is effectively limited to injury impacts, particularly auditory injury such as PTS and TTS. This limited definition is not warranted by the available evidence.
- The consequence of adopting a narrow interpretation is that SEA analysis of predicted significant group effects is likely to represent a substantial underestimate of potential adverse impacts of oil and gas and offshore wind-farm development.
- The report fails to adequately appraise the status of evidence concerning behavioural disturbance and communication interference effects of noise and inappropriately underplays its significance for strategic planning.
- The report does not adequately consider the problematic nature of establishing short-term effect to longer-term population level effect relationships. It is unfortunate that the report makes only passing reference to the NRC (2005) report and does not adequately address the issues raised by it.
- The report is misleading in confusing the lack of available evidence on short-term behavioural effect/population effect relationships with the non-existence of such relationships.
- The report in seeking to predict potential effects under conditions of uncertainty would benefit from a greater emphasis on the use of well-supported theory rather than relying on specific previous empirical findings alone. The use of frameworks such as that of allostasis theory (McEwen and Wingfield, 2003) is likely to be helpful.
- While considerable emphasis is placed in the report on the application of mitigation measures to reduce or avoid adverse effects of noise impacts, little or no evidence is supplied concerning whether particular mitigation methods are effective. It is recommended that greater emphasis is placed on the evaluation of mitigation methods. SOS notes in this connection substantial criticism of JNCC guidelines in the literature.
- With respect to mitigation SOS believes that spatio-temporal restrictions on noise-generating activities are likely to be particularly valuable from a conservation point of view, but that these have been given insufficient consideration in the report. SOS disagrees with the conclusion of the report that neither regional or local prohibitions on the activities under consideration by the SEA are justified by acoustic disturbance considerations. SOS believes in particular that the introduction of acoustic buffer zones in relation to key MPAs would be valuable and would represent justification for local restriction.
- With some qualification SOS endorses particular recommendations of the SEA report that bear on noise impacts on marine mammals, specifically : SEA Recommendations 3, 6, 7, 9, 15, 22, and 23.

Report assumptions concerning the 'biological significance' of noise effects and the consequences of these

The SEA Environmental Report has adopted a limited definition of the biological significance of the effects of human generated noise associated with oil and gas exploration and development (OGED) and offshore wind farm development. This has significantly influenced its strategic recommendations in relation to licensing and leasing for these activities. The limited definition applied is not justified by available evidence concerning effects of anthropogenic noise on marine mammals, or by theoretical considerations concerning the potential relationships between relatively short-term (eg physical/auditory and behavioural disturbance) effects and longer term population effects that bear on favourable conservation status.

The primary analysis presented in the SEA report concerning the potential effects of noise associated with OGED and offshore wind farm development is based on guideline sound exposure levels for marine mammals provided by Southall et al (2007). These guidelines relate to two levels of potential effect. The first level concerns sound exposure that would be anticipated to lead to physical injury including, in particular, auditory damage leading to permanent threshold shift (PTS). The second level referred to in the SEA report as the 'behavioural response' level concerns sound exposure that would be anticipated to lead to auditory temporary threshold shift (TTS). Both of these levels relate to injury consequences of sound exposure.

The SEA Assessment Summary (p.xi) states that, *'recent expert assessments have recommended that onset of significant behavioural response from a single pulse is taken to occur at the lowest level of noise exposure that has a measurable transient effect on hearing'*. Strictly, this recommendation is based on a single expert assessment (the Southall et al. report), as other assessments (eg that of the U.S. National Marine Fisheries Service, NMFS) do not recommend this, but in any event this misrepresents their view. Southall et al (op. cit.) provide an extensive discussion of noise effects characterised as 'behavioural disturbance'. These extend across avoidance, behavioural change, masking and communication effects and others. The diversity of response observed in studies to date, difficulties associated with what could be defined to constitute significant behavioural disturbance, and inter-species variability all contributed to a decision by the Southall group to **take** significant behavioural disturbance to occur at the level that has a measurable transient effect on hearing (ie TTS onset). This represented an expedient (but practical) solution to the difficulties of associating consistent and reasonably valid sound exposure levels with 'behavioural' outcomes. The decision did not have the implication that lower levels of noise exposure or non-injury effects were not potentially biologically significant.

The sound exposure guideline levels provided by Southall et al have been used in the SEA report to estimate spatial ranges from key sound sources (eg seismic airgun array, pile-driving operations) that would be predicted to lead to injury effects at the two levels defined above. Applying these spatial ranges in combination with SCANS II data on group size and population density of cetacean species around the UK, estimates are made of the likelihood of injury to members of a marine mammal 'significant group' were a sound source to be operating in the middle of their distribution. Predicted sound exposure levels ('Effects Threshold Levels', 'ETLs') are determined for the margins of an area that a significant group is predicted to occupy and inferences about probability of group member exposure to damaging sound levels are derived from these. Based on

these analyses the report concludes, *'that single seismic or pile-driving sources are unlikely to have a significant disturbance effect with the possible exception of small odontocetes at locally high population densities'* (Assessment Summary,p.xii).

The SEA report refers to certain other guidelines on sound exposure levels for marine mammals that have been advocated. These include particularly those provided by the U.S.Nationa Marine Fisheries Service (NMFS). The NMFS have adopted two levels of sound exposure criteria which differ in important respects from those of the Southall et al group. The first is 'level A harrassment' defined as a level 'likely to have the potential to cause serious behavioural, physiological and hearing effects' while 'level B' harrassment is understood to relate more generally to non-injury behavioural disturbance. Both Southall group and NMFS sound exposure guidelines are used to determine spatial ranges at which effects at defined levels would be predicted to occur. Indicative ranges are presented in Table 5.1 of the report. Drawing on data from this table a comparison of predicted spatial ranges for the two sets of guidelines is shown below :

Table 1. Comparison of spatial ranges at which effects are predicted for seismic survey for guideline sound exposure levels : Southall et al (2007) 'Injury level' versus NMFS 'level A harrassment'

	Effective horizontal source level / dB re 1 μ Pa p-p	Southall et al (2007) 'Injury' sound pressure level*/ dB re 1 μ Pa p-p	NMFS 'level A harrassment' sound pressure level / dB re 1 μ Pa p-p	Predicted spatial range of effect - Southall / metres	Predicted spatial range of effect - NMFS / metres	Ratio of predicted Southall spatial range to NMFS predicted spatial range
Deep water	245	230	198	5.6	224	1 : 40
Shallow water	245	230	198	10.0	1,359	1 : 140

* multiple pulse data given

Table 2. Comparison of spatial ranges at which effects are predicted for seismic survey for guideline sound exposure levels : Southall et al (2007) 'Behavioural response level' versus NMFS 'level B harrassment'

	Effective horizontal source level / dB re 1 μ Pa p-p	Southall et al (2007) 'Behavioural response' sound pressure level*/ dB re 1 μ Pa p-p	NMFS 'level B harrassment' sound pressure level / dB re 1 μ Pa p-p	Predicted spatial range of effect - Southall / metres	Predicted spatial range of effect - NMFS / metres	Ratio of predicted Southall spatial range to NMFS predicted spatial range
Deep water	245	224	178	11.2	2,239	1 : 200
Shallow water	245	224	178	25.1	29,286	1 : 1200

* single pulse data given

While comparison sound pressure levels used for the two guidelines are not precisely comparable it is clear that the spatial ranges at which effects are predicted using NMFS guidelines are much larger than those predicted using 'Southall' guidelines. The guidelines provided by Southall et al for 'injury' (eg PTS equivalent effects) are derived from more extensive and recent evidence than that on which the NMFS level A harassment guidelines are based. While the Southall et al guideline evidential basis is acknowledged by them to be limited, resting primarily on small sample size captive animal studies, and extrapolation from terrestrial mammal data, nonetheless, the Southall 'injury' guidelines can be argued to be more strongly supported than the 'level A harassment' guideline of the NMFS. However, for behavioural effects the substantial difference in spatial range predictions reflects a difference in definition of behavioural disturbance.

In the SEA report only the Southall group guidelines were used in the prediction of 'significant group effects'. This followed from the assumption in the report that only injury type effects of noise on marine mammals are biologically significant. Were sound exposure levels relating to more general behavioural disturbance (such as the NMFS level B harassment criteria) applied, increased estimates of risk of 'significant group effects' are likely. For example, for seismic survey conducted in shallow water, applying NMFS guidelines for 'behavioural disturbance', the estimated spatial range is greater by a factor of over 1,000, which is likely to lead to substantial increases in identified risk of 'significant group effects'.

Behavioural and other effects of anthropogenic noise

Southall et al (op. cit.) discuss a range of potentially important non-injury consequences of exposure to seismic and other significant anthropogenic noise sources. They argued that given the varied evidential base that it was inappropriate to define broad, general guideline sound exposure levels for these. There is no suggestion in their report that such consequences did not have the potential to be biologically significant ones. The SEA report in fact records that, 'Southall et al (2007) noted the importance of contextual variables in determining behavioural response, together with the presence or absence of acoustic similarities between the anthropogenic sound and biologically relevant natural signals. They suggest that a context-based approach to determining noise exposure criteria for behavioural responses will be necessary'.

However, the SEA report is dismissive of evidence for biologically significant non-injury behavioural consequences of sources such as seismic survey and pile-driving. For example, the report states (following previous SEAs) that, '*The balance of evidence suggests that effects of seismic activities are limited in species present in significant numbers ... to behavioural disturbance which is likely to be of short duration, limited spatial extent and of minor ecological significance*' (p.95). Discussion concerning studies cited by Southall et al concludes that '*The majority of studies reviewed by Southall et al. (2007)... recorded no observable response .. ; the observed effects corresponding to "minor or moderate individual and/or group avoidance of sound source"*'.

The dismissal of evidence concerning behavioural effects is unwarranted. The SEA report itself (p.73) refers to the findings of the extensive observations by Stone and Tasker (eg Stone and Tasker, 2007) of seismic surveys, providing consistent evidence of reduced sighting of a range of cetacean species during surveys, avoidance, and other behaviour changes. Reference is also made, for example, to studies by Weir (2008)

which similarly showed movement to greater distances of dolphin species during seismic operations. Elsewhere, in the report evidence of response of marine mammals to noise associated with wind-farm construction and development is discussed. This evidence includes reduced acoustic activity and reduced density of porpoises after pile-driving events (eg Tougaard et al, 2003a, b, 2005); decrease in the number of hauled out harbour seals at a substantial distance from the construction site during pile-driving activity (Edren *et al.*, 2004); and indications of behavioural responses in harbour porpoises and harbour seals to playbacks of simulated offshore turbine sounds (Koschinski *et al.*, 2003). Concerning long-range effects McCauley et al (1998, cited in Parsons, 2009) found that humpback whales responded to seismic testing at distances that were not observable from the survey vessel, females with calves showing most marked changes even at 7-12 km from the vessel. Displacement has been evidenced in a study over ten years in Brazilian waters which found correlations between decreasing cetacean density with increasing seismic activity that could not be accounted for by variation in other oceanographic parameters that were measured (Parente et al, 2007, cited in Parsons, 2009).

Evidence of behavioural effects is limited but the extent and nature of the evidence does not enable conclusions to be drawn about the likelihood of biologically significant consequences of any such changes, or, given the paucity of data about the extent of these. The categorical statements provided at a number of points in the SEA report that such effects are either not shown or are trivial have little substance. This is illustrated for example by the following statement, *'Although quantitative observational data on behavioural responses to stimuli comparable to seismic and pile-driving sources are very sparse, such data as do exist indicate that responses are not biologically meaningful (i.e. zero response or minor/moderate avoidance) at these sound levels'*(p.94). This simultaneously acknowledges the extreme sparsity of data but seeks to draw (very prematurely) general conclusions from that which exists.

Behavioural responses to anthropogenic noise have generally been studied by visual or acoustic monitoring of abundance. Both methods have considerable practical difficulties associated with them, in particular limitations in identifying specific behavioural changes that may bear on life functions and survivability. However, recently Miller (2009) using a sophisticated auditory tagging method with sperm whales was able to show specific changes in the nature of diving behaviour consequent on exposure to noise sources. This method effectively provided data on 'what was going on under the water' and further studies of this kind have the potential to produce evidence of specific behaviour changes that may be biologically important. Potential effects at greater distance have also seldom been examined. The SEA report notes in this context that, *'the spatial scales of cetacean distribution are at least an order of magnitude greater than those which can be monitored by either visual or passive acoustic methods'* (p.94).

In referring to evidence from the Weir (2008) study that noted behavioural changes of Atlantic dolphin to seismic survey noise, the SEA report observes that, *'there was no evidence for prolonged or large-scale displacement of each species from the region during the 10 month survey duration'*. While this study observation is of interest in itself it highlights the question of the time scale over which a cetacean group needs to be monitored in order to determine if effects occur. The studies by Bejder and colleagues (eg Bejder et al, 2006) concerning the effects of dolphin-watching activities found that significant reductions in dolphin presence did occur relative to a control area, but this effect was only apparent after a period of many years observation. While seismic survey

activity at a particular location is unlikely to last for years, and while pile-driving associated with individual turbine construction will not last for this period, with sustained, intensive activity within an area (eg for construction of a large scale offshore wind farm) the possibility exists for longer term displacement consequent on several years noise exposure in a region. Evidence for such an effect would depend on collection of evidence over a substantial period of time with appropriate controls.

A number of commentators (e.g. Weilgart, 2007) have considered what observed behavioural changes might mean. Such authors have also critically examined the legitimacy of inferring that lack of observed behaviour change on exposure to sound sources necessarily implies a lack of a biologically significant consequence of this exposure. A prime consideration in such discussion is the costs associated with staying and leaving understood in terms of reproductive fitness. Movement from an area or avoidance of it may create increased energetic costs for foraging, but may also, in certain circumstances have little effect if other readily accessible areas are equally resource rich. The meaning and effects of any such movement will depend on circumstance and requires thoughtful analysis. Further, it has been proposed (e.g. Weilgart, *op.cit.*) that if an animal leaves an area costs may be incurred in terms of access to feed, protection or breeding opportunities, and that it may remain despite negative effects of sound exposure, applying a kind of trade-off. Simple inferences to the effect that, 'they appear not to have moved, so it must be O.K.' represent an untested assumption.

Other commentators (eg Tyack, 2008) have emphasised the potential for auditory masking at sound levels that would not result in injury. Masking has been predicted based on knowledge of marine mammal audiograms and demonstrated experimentally in captive animals (eg Schlundt et al, 2000; Nachtigall et al, 2004). Masking has the theoretical potential to cause an individual to be less able to maintain social contact over distance, to be less responsive to sound that would alert to a predator, to be less able to use echolocation to locate prey and to be less able to use passive listening (without echolocation) (e.g. Gannon et al, 2005). Tyack (*op.cit.*) argues that there would have been strong evolutionary pressures for marine mammals to develop compensatory mechanisms in relation to the potential for masking by a range of naturally occurring sounds including, for example, increasing intensity of vocalization, shifting frequency used and other mechanisms. He presents evidence in the context of significant increases in shipping traffic and ocean 'pollution' by low frequency noise that some whale species (eg right whales) in certain circumstances now habitually use higher frequency vocalizations. While such mechanisms may be compensatory they entail energetic costs, and may, in any event be limited in their effectiveness. Theoretically-based estimates discussed by Tyack suggest that the range over which far-travelling cetaceans can now communicate is often substantially reduced given ambient levels of noise augmented by human sources, and suggests where species have reduced densities this will exacerbate difficulties in maintaining social contact and breeding. Though Tyack's analysis refers largely to ship noise effects, the potential for both exploratory and operational contributions to background noise from OGED and wind-farm activity to have biologically significant effects in these terms is indicated.

The SEA assessment with respect to effects of OGED and offshore wind-farm related noise is in error if it fails to recognize that hypotheses concerning potential effects of masking, behaviour change or lack of change under certain conditions of exposure

associated with reproductive fitness costs, are theoretically plausible and require testing to be supported or disconfirmed.

Population level effects

In the first paragraph of the Assessment Summary relating to 'Biodiversity, habitats, flora and fauna' the SEA report states, '*...a general distinction may be drawn between effects associated with physical injury, and effects associated with behavioural disturbance*' (p.xi). While this statement is in principle open enough to consider effects that are the longer-term consequence of physical injury or behavioural disturbance the statement betrays a strong tendency throughout the SEA report to consider these levels of effect as the only ones to which evidence might relate. Yet the biological significance of noise effects is most clearly expressed in terms of consequences for the population. Such consequences may be in terms of numbers, population structure, distribution and health status (amongst others). Immediate effects including injury, threshold shifts, masking, behavioural change including site avoidance, are more generally biologically important (from the species point of view) only to the extent that they impact on population viability.

A very substantial problem is that data concerning the relationships between short-term effects and longer-term population level effects is largely lacking. The NRC (2005) provided an extensive discussion of this issue recommending a comprehensive and long-term programme of international research that would be designed to provide data that would enable elucidation of relationships between short-term effects and population level effects. In addressing this important issue the NRC developed a model which sought to identify a chain of relationships. This model relates particular sound stimuli to behaviour change, this to life functions of animals immediately affected, this to vital rates within the population, and this, finally, to population effects. Each level is related to the next, 'higher', level by a 'transfer function' which is a general term describing how effects at one level influence effects at the next. The model is referred to as the Population Consequences of Acoustic Disturbance Model (PCAD). The SEA report makes brief reference to the NRC model (eg p.69, p.70) but fails to consider the relevance of the framework provided or the issues raised by the report concerning determination of causal relationships between noise impacts and population level effects. Why such a discussion is omitted is unclear.

The SEA report does though state that, '*Data on cetaceans are typically few and often characterized by considerable uncertainty and both seasonal and spatial gaps making the identification of trends very difficult. It is even more difficult to establish any causes of potential trends*' (p.57). Despite this acknowledged absence of evidence, which is reinforced very strongly by the NRC report, concerning short-term effect/longer-term outcome relationships, the SEA elsewhere makes the statement, '*Postulated chronic effects (for which evidence is almost entirely absent) include long-term behavioural responses, exclusion and indirect effects*'. (p.69). This comment confuses a lack of evidence on relationships with evidence that such relationships aren't found and is very misleading indeed.

In accounting for the approach adopted by the SEA in its evaluation of noise-related evidence, the SEA states that, '*At a strategic level, a distinction has been drawn between impacts which may be significant in terms of conservation status of a species or population (and hence are significant in strategic terms) which may be significant to individual animals, but which will not influence sufficient numbers to have a significant*

effect on population viability or conservation status (and hence strategically significant)'(p.61). Given the strategic focus it is incumbent on the SEA to recognize the limitations of current evidence concerning relationships between more immediate effects and longer-term population level effects. It effectively leaves these central questions unexamined and makes implicit but untested assumptions about the 'non-existence' of relationships between potential effects such as behavioural disturbance (broadly understood) and communication interference and population level effects bearing on conservation status.

Application of theory

The SEA exercise is concerned with anticipating and predicting effects of developments in very diverse circumstances, of types and at scales that may not have previously occurred and for which there may very often be both a lack of experience and accumulated data. These features apply strongly in the case particularly of large scale offshore wind-farm development and gas storage, but also bear to some extent on OGED activity. As pointed out above and acknowledged in the SEA report, data is very limited concerning specific effects on marine mammals of these development activities, particularly so relating to longer-term effects bearing on population viability and conservation status. Collection of relevant data in the future is likely to improve understanding and predictive ability but may prove difficult or impossible to obtain. In this context the value of application of relevant well-supported theory is likely to be critical from the point of view of making reasoned predictions about likely consequences.

It is a feature of the SEA report with respect to consideration of acoustic effects on marine mammals that it adopts an atheoretical approach. Recommendations in the report tend to be made only where there is very specific empirical evidence of a particular relationship. This has tended to result in a narrowing of relevant factors considered and the tendency to build solutions on those apparently harder pieces of evidence that exist. This has in some cases paradoxically caused a large set of recommendations to be built on a small set of data which itself does not have an overly strong evidential base (eg the Southall et al sound exposure guidelines), and which in certain respects may be viewed as 'preliminary'.

A number of valuable theoretical approaches exist which bear on making predictions concerning potential effects of impacts such as noise, though it is true that these are quite general in nature. These include the theory of allostasis proposed by McEwen and Wingfield (eg McEwen and Wingfield, 2003) which provides a basis for considering how multiple demands can bear on reproductive fitness. The application of allostasis theory is argued for strongly by Tyack in his recent review concerning effects of large-scale changes in the marine acoustic environment (Tyack, 2008). Certain studies (e.g. Olesiuk, 2002, cited in Tyack, 2008) have now considered making more focused use if allostasis theory by calculating estimates of energetic costs associated with particular alternative behaviours (eg site avoidance) that a marine mammal species might adopt. Elsewhere, Wright et al (2007) point out, for example, that there is extensive evidence that the 'stress response' is very highly conserved across mammalian species and that useful predictions can be made about potential effects of stressors such as noise exposure applying a theoretical understanding of the stress response.

The SEA makes inadequate use of theoretical frameworks to aid prediction in the face of uncertainty. The potential value of the integration of use of relevant theoretical

frameworks (such as allostasis theory) with empirical findings is illustrated by the consideration of potential cumulative and interactive effects. Here direct evidence of the extent of an impact under a particular combination of influences is unlikely to be available (certainly not in advance in most cases) and prediction would depend on judgement using theoretical principles where the theory itself has a strong basis. A particular case in point is the consideration of the potential impact of climate change. This is an ongoing phenomenon and specific empirical data concerning, for example, the interactive impact of climate change and exposure to anthropogenic noise is unlikely to be straightforwardly available. Anticipating and estimating interactive and cumulative effects is very likely to depend on applying theoretical frameworks such as those described above.

Mitigation

At many points throughout the SEA report reference or appeal is made to the application of mitigation methods that it is implied would address particular or residual concerns about potential impacts of OGED and wind-farm related noise on marine mammals. For example, to some extent in contradiction to statements made elsewhere, in the Assessment Summary (p. xi) the SEA report states, *'In the light of limited behavioural data the SEA also concurs with the scientific consensus judgement that seismic and pile-driving operations have the potential to cause some level of disruption of normal behaviour in marine mammals and possibly some fish at ranges of many kilometers'*(p.xi). The report continues, *'However, both planning and operational controls cover noise from relevant marine activities, including geophysical surveying and pile-driving'*(p.xi). The conclusions to the Assessment Summary state that, *'It is concluded that there are no overriding environmental considerations to prevent the achievement of the offshore oil and gas, gas storage and wind elements of the plan/programme, albeit with a number of mitigation measures to prevent, reduce and offset significant adverse effects on the environment and other users of the sea.'*(p.xx).

Considerable weight then is placed by the SEA on mitigation measures. For this appeal to be meaningful it is essential that mitigation measures are effective in 'mitigating' potential adverse environmental effects. It is important in this context that mitigation measures have an appropriate evidential base and that data continues to be collected to evaluate whether proposed mitigation measures do work as anticipated and to what extent they are, in practice, effective. The SEA provides virtually no discussion or direct evidence relating to proposed mitigation measures or to consideration of the needs for evaluation of these. While the SEA report provides very extensive discussion of other matters this represents a shortcoming in terms of the opportunity the report provides to evaluate the environmental assessment.

Concerning the UK context, to which the SEA report applies, more specific reference is made at a number of points to the application of JNCC guidelines particularly with reference to mitigation of potential noise effects. The report refers (p.80) to the, JNCC's *'Guidelines for minimizing acoustic disturbance'* as being the major operational control and mitigation device through which seismic surveys in the UK are regulated. Quite extensive discussion is provided of specific features of the guidelines based both on already published documents and the draft revision of June, 2008. This includes coverage of the requirements for a marine mammal observer (MMO), progressive build-up of sound prior to seismic testing, recommendations for use of passive acoustic monitoring (PAM) under certain circumstances, and discussion of guidelines associated

with particular licensing decisions. In relation to offshore pile-driving operations the report refers to Marine and Fisheries Agency (MFA) requirements for awarding of licenses that appear to closely parallel the JNCC requirements for seismic testing.

While many of the recommendations and requirements of the JNCC (and equivalently the MFA as described) appear to be of potential value, the JNCC guidelines (which have been influential internationally as a framework) have been subject to quite substantial criticism in recent years (eg Weir and Dolman, 2007; Compton et al, 2007; Parsons et al, 2009). These criticisms concern (amongst others) the lack of a clear argument for a 500m exclusion zone, lack of evidence that the 'ramp up' of sound is effective in deterring marine mammals, concern over inadequate training and inconsistencies in approach of MMOs, and questions concerning enforcement of the guidelines.

The 500m exclusion zone currently specified to be clear of marine mammals prior to 'ramp up' of sound from an airgun array, has a practical component as a distance beyond which it would be difficult to see cetaceans. However, observation within this distance too can be very problematic in particular circumstances of poor visibility. While the Southall et al guidelines concerning acute injury effects at the level of PTS or TTS mean that it is unlikely that these would occur at a range beyond 500m the potential for sound levels to cause behavioural disturbance more generally remains at this distance. Compton et al (2007) argue that, under particular conditions of propagation, a sound exposure level of 180dB re 1 μ Pa rms, for example, may occur at 1000m. Compton et al (2007) also refer to some evidence of alterations in behaviour of cetaceans in relation to exposure to seismic survey at distances of several kilometers. While context and species differences are pertinent certain countries (eg Australia, New Zealand) have adopted exclusion distances beyond 500m up to 3km. Parsons et al (op. cit.) point out, further, that the JNCC guidelines do not take account of the volume of the airgun battery used. Compton et al (2007) suggest that, *'there is a clear need for case by case calculation of where a safe sound pressure level is achieved based on site-specific sound speed profiles and airgun parameters, in order to identify safety radii that are appropriate, precautionary and that can be effectively monitored. The calculation of safety radii based on sound pressure levels represents a far more scientific way forward than the arbitrary designation of a 500m radius.'*(p.258).

Compton et al (op. cit.) note that the soft-start/ramp-up has become a standard mitigation tool, but that it's effectiveness should be the subject of further research. Similarly, Weir (2008, cited in Parsons, 2009) state that soft-start, *'is currently implemented as a common sense procedure, and there is little information on its efficacy in evoking an appropriate response from marine mammals'*(p.5). Compton et al (op. cit.) express concern about the potential for the procedure to lead to habituation which may have the unintended consequence of leading to exposure to damaging noise levels. Parsons (2009) suggests, in this context too, that certain species may seek to avoid a noise disturbance vertically, rather than horizontally, ie by surfacing or diving, which may leave them more vulnerable to certain acoustic impacts.

Though this is a requirement in guidelines for certain other countries the current UK JNCC guidelines do not require operators to shut down if a marine mammal or group approaches the source once the survey is operating at full power. Compton et al (op. cit.) state simply that this represents a lack of precaution. Parsons et al (op. cit.) are similarly forthright, stating that, *'This is a mitigation measure that could and should be initiated on all seismic survey vessels with immediate effect'*. It would certainly seem that

the failure to require shut down of a seismic survey when an animal enters a previously applied exclusion zone, and in the context of the assumption that soft-start is of value, represents a clear contradiction and appears incompatible with legal requirements to avoid intentional disturbance of cetaceans.

With reference to visual monitoring in relation to initial exclusion zones both prior to and during seismic survey operations, both Compton et al (op.cit.) and Parsons et al (op.cit) note that this can be highly problematic under various circumstances that affect visibility. Species also vary in their detectability – Parsons et al refer to the harbour porpoise, one of the most frequently encountered cetacean species in UK waters, as being particularly cryptic. They recommend that guidelines should be amended to include requirements to substantially reduce or postpone seismic activities under conditions of low visibility including certain sea states, fog and so on. Currently the JNCC guidelines do not require in the UK that operations are shut down at night and Weir and Dolman (2007) present some anecdotal evidence that this occurs. The SEA report makes reference to new guidance, that may come into effect, that is contained in the draft June, 2008 revision of the guidelines that would bear on license requirements. The increasing expectation of use of PAM appears to be likely to be valuable particularly in the light of evidence discussed by Compton et al (op. cit.) that combination of visual and PAM monitoring can increase number of animals detected by between 5 and 8 times. (In the context of application of mitigation technologies, SOS notes the interesting discussion provided in the SEA report concerning the potential for significant reductions in emitted noise in pile-driving by use of protective 'sleeves' containing foam or other substances – it is to be hoped that these will be developed, tested and widely applied).

Even with appropriate analysis, evaluation and refinement of acoustic disturbance guidelines, where these have legislative force (as in the case of JNCC guidelines) it is essential that their application is monitored and enforced. There has been much concern about the extent to which this is actually the case. The authors so far referred to concerning mitigation methods and current guidelines have each expressed concern about this. Evidence that the concern is warranted has been provided by an incidental analysis that Stone (2003) undertook alongside their long-term examination of relationships between seismic survey activity and marine mammal behaviour. This investigation found that standard assumed practices often did not occur including failures to implement exclusion zones and inadequate or non-existent use of soft-start. The extent to which recommended/required practices were implemented correlated closely with the status of MMOs or other assigned staff on board survey vessels, with those most closely tied (in terms of employment) to the surveying organisation least likely to implement mitigation measures fully. A table summarizing these results adapted from Stone (2003) is presented below :

Table 3. Percentage of occasions on which seismic survey mitigation measures were implemented according to status of marine mammal observer.

Observer:	Dedicated MMO	Fisheries Officer	Crew member
Delay to survey if cetacean within 500m	70%	0%	0%
For large gun arrays implementation of 20 minute soft-start	93%	80%	32%
For site surveys implementation of 20 minute soft-start	31%	3%	1%

Spatio-Temporal Mitigation

Parsons et al (2009) accept that, *'mitigation measures currently in place 'may, in some cases, reduce some of the acute impacts of marine noise noise pollution' (p2)*. However, they also point out, *'But they do not mitigate against the chronic degradation of habitat caused by repeated use of this far-traveling and high-intensity noise' (p.2)*. They further state that, *'Current guidelines and mitigation standards also do not take into account cumulative exposures or synergistic effects with other exposures' (p2)*. This report has discussed a range of evidence concerning effects of increased ambient noise in the marine environment. This has included evidence for behavioural change by marine mammals at long-distance from seismic and pile-driving sources, experimental evidence of masking effects and theoretical concern for the consequences of masking in the wild, evidence of compensatory mechanisms (in terms of frequency or intensity changes of communications) now observed in a number of cetacean species where ambient noise levels have increased due to human activity (particularly shipping), and theoretical concerns for impacts on populations as a result of reduced ability to 'keep in contact' with conspecifics at long distances (and others). While the SEA report has focused on addressing effects of high intensity noises at close proximity in determining strategic recommendations, expert sources on which they rely (e.g Southall et al, 2007) are not sanguine about the potentially biologically significant effects on marine mammals of 'mid-intensity' noise sources whether localized and of short duration, or where it may alter marine acoustic habitat on a sustained basis.

That such concern is warranted in relation to UK waters and OGED and wind-farm construction activity is emphasised by data provided in the SEA report concerning levels of activity and audibility of noise from these operations. The SEA presents analysis that indicates that over the last decade there were approximately 63 million individual seismic survey 'shots'. It is pointed out that, *'Assuming a 10s shot interval, the total survey period (2D + 3D) is equivalent to between 188 days/year (2000) to 1195 days/year (2006) – i.e. on average during 2006, more than three surveys were carried out concurrently in the whole of the UK waters. In addition to this UK seismic noise budget, noise propagating from surveys in contiguous national waters (particularly Irish, Faroese and Norwegian deep waters) will be present'*. With respect to pile-driving associated with wind-farm construction activity there have been approximately one million hammer strikes to date with a further 4.4 million currently consented. Predicted seismic shot activity is estimated at approximately 3.8 million shots a year, while, with anticipated growth in wind-farm construction, the hammer 'strike rate' would be predicted to build

progressively to 5 million strikes a year at a peak in 2017, then reducing over a period of years to the order of 1 million per year (see pp. 85-89). The SEA report also provides estimates of the area in which seismic sound activity can be anticipated to be potentially audible to marine mammals. They state that, *'Typical spatial extents of 3D seismic surveys are of the order of 25km in any direction (625km² area). Assuming propagation distances of audible sound to around 100km in all directions (see above), the theoretical instantaneous area of audibility is a circular area of 31,400km², and the total area of audibility during a survey is a rectangular area of 50,625km²' (p.80).*

Many commentators with expertise in understanding of cetacean behaviour and population dynamics have called, and are now calling more urgently, for mitigation to include or emphasise restrictions in space or time (e.g. Weilgart, 2007; Tyack, 2008; Parsons et al, 2009, Simmonds and Elliott, 2008; Agardy et al, 2007; Compton et al, 2007; Harwood et al, 2002; Wright et al, 2007 and others). Most emphasise that such restrictions are likely to represent the single most powerful means of mitigation that is precautionary and would impact most strongly in terms of helping to achieve or maintain favourable conservation status. In this connection a global scientific workshop on spatio-temporal management of noise was held in 2007. The report from this workshop (Agardy et al, 2007) provides a set of guidelines for approaching the evaluation of need for spatio-temporal mitigation, and a set of general steps for acquiring appropriate data and implementing particular actions in different contexts around the world. They define different sorts of spatial restriction. An important suggestion that they make that is pertinent to the SEA and it's strategic recommendations is that many Marine Protected Areas (MPAs) would require buffer zones if they are most effectively to reduce levels of noise impacting on protected species by human activities in surrounding waters. For example, they point out that SACs are almost exclusively less than 1000km² in size, such that high intensity low frequency noise, and some mid-frequency noise too, are likely to propagate at levels well above ambient background within them even where sound sources are well outside these areas. The workshop report implies that such restrictions could be valuable in many cases even if implemented on a temporary basis.

It is to be noted that climate change may bear very significantly on viability of marine mammal populations. The extent and nature of effects, as the SEA report acknowledges at several points, are, of course, very difficult to predict, but alterations in trophic webs, significant displacement to higher latitudes, and potential exposure to increased pathogenic risk have all been suggested as possible consequences (amongst others) (eg Simmonds and Eliot, 2008). Many marine populations are already very vulnerable and are a very long way from 'favourable conservation status' given effects of many decades of negative anthropogenic effects. Simmonds and Eliot (2008) suggest that what is essential is that climate change considerations are incorporated into conservation plans and strategies, and that efforts are made, *'to urgently increase the resilience of ecosystems and species to climate change'* (p.207). They suggest that is particularly important that a highly precautionary approach is reflected in management actions. Following Hansen et al (2003) this is suggested to include the provision of adequate and appropriate protected spaces. This is entirely consonant with the development of buffer zones for acoustic disturbance in relation to relevant MPAs. Though the SEA report concludes, *'On the basis of the available data, it is therefore not considered that either regional or local prohibitions on the activities under consideration by this SEA are justified by acoustic disturbance considerations'*, this appears to be insufficiently precautionary particularly with respect to local prohibitions on activities. SOS suggests that at a strategic level consideration is given to the assessment and

SOS SEA Consultation Response

development of acoustic buffer zones around pertinent MPAs, and to the designation of other areas of reduced acoustic input.

References

Bejder, L. Samuels, A., Whitehead, H. and Gales, N. (2006a)) Interpreting short-term behavioural responses to disturbance within a longitudinal perspective. <i>Anim. Behav.</i> 72 : 1149-1158.
Gannon, D., Barros, N., Nowacek, D., Read, A., Waples, D., and Wells, R. (2005) Prey detection by bottlenose dolphins, <i>Tursiops truncatus</i> , an experimental test of the passive listening hypothesis. <i>Animal Behaviour</i> , 69 : 709-720
Hansen L., Biringier J.L. and Hoffman J.R. (2003) Buying time: a user's manual for building resistance and resilience to climate change in natural systems. WWF Report. Published by WWF, Switzerland.
Harwood, J. (2002) Mitigating the effects of acoustic disturbance in the oceans. <i>Aquatic Conservation: Marine and Freshwater Ecosystems</i> . 12 :485-488.
Koschinski S, Culik BM, Henriksen OD, Tregenza N, Ellis GM, Jansen C & Kathe G (2003). Behavioural reactions of free-ranging harbour porpoises and seals to the noise of a simulated 2 MW windpower generator. <i>Marine Ecology Progress Series</i> 265 : 263-273.
McCauley, R.D., Fewtrell, J., Duncan, A.J., Jenner, C., Jenner, M.-N., Penrose, J.D., Prince, R.I.T., Adhitya, A., Murdoch, J., McCabe, K., 2000. Marine seismic surveys – a study of environmental implications. <i>APPEA Journal</i> 692, 708.
McEwen, B., and Wingfield, J. (2003) The concept of allostasis in biology and biomedicine. <i>Hormones and Behaviour</i> . 43:2-15.
Nachtigall, P., Supin, A., Pawloski, J., and Au, W. (2004) Temporary threshold shifts after noise exposure in the bottlenose dolphin (<i>Tursiops truncatus</i>) measured using evoked auditory potentials. <i>Mar. Mamm. Sci.</i> , (20 (4); 673-687.
National Research Council (NRC) (2005) National Research Council: Marine mammal populations and ocean noise – determining when noise causes biologically significant effects. The National Academies Press, Washington.
Olesiuk, P. F., Nichol, L., Sowden, M., and Ford, B.. 2002. Effect of the sound generated by an acoustic harassment device on the relative abundance and distribution of harbor porpoises (<i>Phocoena phocoena</i>) in Retreat Passage, British Columbia. <i>Marine Mammal Science</i> 18:843–862.
Parente, C.L., de Araújo, J.P., de Araújo, M.E., 2007. Diversity of cetaceans as a tool in monitoring environmental impacts of seismic surveys. <i>Biota Neotropica</i> 7, 1–7.
Parsons, E., Dolman, S., Jasny, M., Rose, N., Simmonds, M., Wright, J. A critique of the UK's JNCC seismic survey guidelines for minimizing acoustic disturbance to marine mammals : Best practice? <i>Marine Pollution Bulletin</i> . Doi:10.1016/j.marpolbul 2009.02.024
Schlundt, C., Finneran, J., Carder, D., and Ridgway, S. (2000) Temporary shift in hearing thresholds of bottlenose dolphins, <i>Tursiops truncatus</i> , and white whales, <i>Delphinapterus leuca</i> , after exposure to intense tones. <i>J. Acoust. Soc. Am.</i> 107(6).
Simmonds, P, and Elliott, W. (2009) Climate change and cetaceans : concerns and recent developments. <i>Journal of the Marine Biological Association of the U.K.</i> 89(1) 203-210
Southall, B.L., Southall, A., Bowles., E, Ellison., Finneran, J., Gentry, R., Greene, R., Kastak., , Ketten, D., Miller, J., Nachtigall, P., Richardson, J., Thomas, A., and Tyack., P. (2007) Marine mammal noise exposure criteria. <i>Aquatic Mammals</i> . 33 (4).
Stone, C. and Tasker, M. (2007) The effects of seismic airguns on cetaceans in UK waters. <i>Journal of Cetacean Research and Management</i> . 8 : 255-263.
Tougaard J, Carstensen J, Teilmann J, Bech NI, Skov H & Henriksen OD (2005). Effects

of the Nysted Offshore wind farm on harbour porpoises. Technical Report to Energi E2 A/S. NERI, Roskilde.
Tougaard J, Ebbesen I, Tougaard S, Jensen T & Teilmann J (2003b). Satellite tracking of Harbour Seals on Horns Reef. Use of the Horns Reef wind farm area and the North Sea. Commissioned by Tech-wise A/S. Fisheries and Maritime Museum, Esbjerg.
Tyack, P. (2009) Implications for marine mammals of large-scale changes in the marine acoustic environment. <i>Journal of Mammalogy</i> . 89 (3) 549-558.
Weilgart, L. (2007) The impacts of antropogenic ocean noise on cetaceans and implications for management. <i>Can. J. Zool.</i> 85: 1091-1116.
Weir, C. and Dolman, S. (2007) Comparative review of the regional marine mammal mitigation guidelines implemented during industrial seismic surveys and guidance towards a worldwide standard. <i>Journal of International Wildlife Law and Policy</i> , 10:1, 1-27.
Wier, C.R., 2008a. Short-Finned pilot whales (<i>Globicephala macrorhynchus</i>) respond to an airgun ramp-up procedure off Gabon. <i>Aquatic Mammals</i> 34, 349–354.
Wright, A. et al (2007) Do marine mammals experience stress related to anthropogenic noise? <i>Int. Journal of Comparative Psychology</i> , 20.

SOS SEA Consultation Response

Our Ref: SEA00269/ER/ND
SG Ref: SEAUK00013

Mr Kevin O'Carroll
Head of Policy Unit
Dept of Energy and Climate Change
4th Floor, Atholl House
86 – 88 Guild Street
Aberdeen
AB11 6AR

22 April 2009

By email: sea.gateway@scotland.gsi.gov.uk

Dear Mr O'Carroll

**Environmental Assessment of Plans and Programmes Regulations 2004
UK Offshore Energy – Environmental Report**

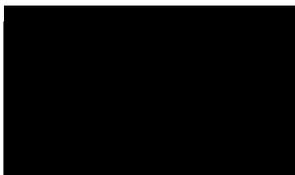
I refer to your Environmental Report consultation submitted under the above Regulations in respect of the UK Offshore Energy Plan. This was received by SEPA via the Scottish Government SEA Gateway on 30 January 2009.

SEPA has used its Scoping consultation response of 28 January 2008 to consider the adequacy of the Environmental Report and this is used as the framework for detailed comments which can be found in Appendix 1. Please note, this response is in regard only to the adequacy and accuracy of the Environmental Report and any comments SEPA may have on the plan itself will be provided separately.

As the Plan is finalised, the Department for Energy and Climate Change, as SEA Responsible Authority, will require to take account of the findings of the Environmental Report and of views expressed upon it during this consultation period. As soon as reasonably practical after the adoption of the plan, the Responsible Authority should publish a statement setting out how this has occurred. SEPA normally expects this to be in the form of an "SEA Statement" similar to that advocated in the Scottish Government SEA templates and toolkit which is available at www.scotland.gov.uk/Publications/2006/09/13104943/13. A copy of the SEA statement should be sent to the Consultation Authorities via the Scottish Government SEA Gateway on publication.

If you wish to discuss anything in this response please do not hesitate to contact me on 01786 452431 via SEPA's SEA Gateway at sea.gateway@sepa.org.uk.

Yours sincerely,



Neil Deasley
Principal Policy Officer
Enc

Chairman
David Sigsworth

Chief Executive
Dr Campbell Gemmell

SEPA Corporate Office
Erskine Court, Castle Business Park, Stirling
FK9 4TR
tel 01786 457700 fax 01786 446885
www.sepa.org.uk

Appendix : Comments on the Environmental Report

The Environmental Report, including the associated annexes, is extremely comprehensive in terms of both its coverage and its level of detail. As noted in our scoping response, it is considered that the approach to the assessment is sound and this has been borne out by the comprehensive nature of the report. SEPA welcomes the comprehensive nature of the report and considers that the key issues have been covered well.

Accordingly, SEPA has only a small number of comments, which are set out below:

Roles and Responsibilities – As you will be aware, the recently established Marine Scotland¹ is the lead marine management organisation in Scotland. It was established on April 1 2009 as a Directorate of the Scottish Government, to integrate core marine functions involving scientific research, compliance monitoring, policy and management of Scotland's seas. It is surprising that the roles of Marine Scotland and the provisions of the proposed Scottish Marine Bill² are not discussed in more detail in the Environmental Report although we acknowledge that some of these changes have occurred since publication of the Environmental Report. The Scottish and UK Government's agreement on Scotland's executive responsibility for planning and nature conservation out to 200 nautical miles³ will also have a key influence and this should be described in order to provide clarity about roles and responsibilities with respect to the planning and management of Scotland's marine waters. These new structures and responsibilities will be key to delivering the 23 recommendations from the SEA as they apply to Scotland.

On Shore Effects - In our scoping response, we considered that the Environmental Report should contain appropriate reference to the potential on shore impacts, specifically from the need to develop infrastructure for the servicing of offshore renewables development and the transmission of electricity generated. The Scottish National Planning Framework 2 SEA considered the environmental effects of grid reinforcements to support renewable energy developments. There appears to have been only relatively short discussion of these issues.

Relationship of SEA with Decision Making – In the scoping response, we commented on the need to be very clear about how the SEA process and the plan preparation process would be integrated. Accordingly SEPA welcomes the identification of 23 recommendations arising from the SEA that will be put in place as the plan is implemented. However, it is unclear the mechanism by which these recommendations will be implemented. In order for this to take place, SEPA would be keen to see, in the SEA Statement, an implementation framework which sets out what recommendations should be taken forward, which party will be responsible for their implementation and when the recommendation can be expected to be brought forward. This would provide a clear framework for the mitigation actions and ensure that the adverse effects that they are designed to mitigate do not occur. SEPA would wish to see clear coverage of this in the SEA Statement when the plan is adopted. Commitment to delivery of these recommendations is key to the success of the SEA.

Recommendation 1 – This is welcomed.

Recommendation 2 – This recommendation seeks to address issues arising with the “massive scale” of offshore windfarm development required for an additional 25GW generating potential. It is surprising that no environmental factors are included within the “presumption against” list given

¹ www.scotland.gov.uk/About/Directorates/Wealthier-and-Fairer/marine-scotland

² www.scotland.gov.uk/Topics/Environment/16440/marine-bill-consultation - This was also subject to a SEA

³ www.scotland.gov.uk/Topics/Environment/16440/marine-bill-consultation/newmarineresponsibilities

the sensitivities of some sites. We acknowledge that this is to a certain extent covered in some of the other recommendations (most notably the precautionary approach set out in recommendation 3 and the buffer zone proposed in recommendation 4 both of which we broadly support), but inclusion of well defined environmental impacts within the list in recommendation 2 would we feel be helpful in providing effective protection of the environment.

Recommendation 13 – This is welcomed and is consistent with our scoping comments

Table 2.2 refers to the fact that new technologies can, once proven, be expected to rapidly become accepted practice. While we would not expect a full explanation of these in the Environmental Report, some evaluation of new technologies on the horizon and their potential environmental effects would have been useful.



Mr Kevin O'Carroll
Head of Policy Unit
Dept. of Energy and Climate Change
4th Floor, Atholl House
86-88 Guild St.
Aberdeen
AB11 6AR

17 April 2009

Email:
sea.2009@berr.gsi.gov.uk,
sea.gateway@scotland.gsi.gov.uk

Dear Mr O'Carroll,

DECC: Consultation on the UK Offshore Energy SEA Environmental Report

Scottish Government SEA Gateway: 00013 Environmental Report – DECC – UK Offshore Energy

I refer to your letter of 30 January 2009, regarding the above consultation, and sent to the Scottish Government SEA Gateway on the same day. In accordance with Section 15(2) of the Environmental Assessment (Scotland) Act 2005, I have reviewed the report on behalf of Scottish Natural Heritage (SNH) in its role as a Consultation Authority under the above Act.

Our general comments on the Environmental Report and its principal recommendations, insofar as they affect Scotland, are set out below. Additional comments on issues relating to Landscape and Seascape are provided in the annex to this letter. We would note, however, that, while the report embraces plans for future oil and gas exploration and production and for gas storage across the UK, including that in Scottish territorial waters (i.e. <12nm from the coastline), the focus of the report is on offshore windfarm construction, excluding development in Scottish territorial waters (on which the Scottish Government (SG) will prepare its own SEA in due course) and on which SNH might be expected to advise. Accordingly, although we highlight a few concerns with respect to the potential impacts of Round 3 windfarm developments beyond territorial waters in Scotland upon features and/or development within territorial waters, our response is focused largely on the approach adopted for the SEA and its implications for oil and gas exploration and for gas storage (insofar as this is covered). For commentary on the adequacy or otherwise of the SEA for future offshore windfarm development around the UK and beyond 12nm in Scotland, we would refer you to and endorse strongly the response submitted separately by the Joint Nature Conservation Committee (JNCC).

General Comments on the Environmental Report.

NB. These are offered without prejudice to our responses to future oil and gas licensing rounds or proposals for oil and gas exploration or offshore windfarm construction in or adjacent to Scottish

territorial waters. SNH reserves the right to respond to individual project Environmental Impact Assessments and, if required, Appropriate Assessments on a case specific basis.

SEA Approach

1. Notwithstanding the comments below, we commend DECC on the breadth of coverage and level of detail of this report and its associated annexes and supplementary technical reports, the generally robust and methodical approach taken to the assessment and the overall quality of the published documents.
2. As part of the SEA approach, a detailed set of SEA Objectives and Indicators is presented in chapter 3.5 (table 3.1) against which “environmental considerations can be described, analysed and compared”. While the stated purpose of these is as a tool for measuring the future effectiveness of the SEA nonetheless we believe these could and should have been used also as a means of testing the plan itself and informing the recommendations. Assuming these are sound and relevant, we recommend that they be applied in this way in the Post-Consultation report as a means of helping to evaluate, more clearly, the implications of the plan.
3. Given the length of the report there appears to be relatively little discussion on the environmental impacts of new coastal infrastructure required to service new offshore developments nor evidence that this has influenced the recommendations in any way (e.g. in terms of determining areas of greater or lesser sensitivity to development). This is in spite of the issue being mentioned in the SEA Scope section (3.6 on page 35). We accept the argument in s5.9 that there are few implications for infrastructure required to support the oil and gas industry, this being adequate for the foreseeable future. Nonetheless, for offshore windfarm construction in the Round 3 areas off the Tay and Forth in SE Scotland and in the Outer Moray Firth, the onshore impact of ancillary connections and development could have a significant effect on the landscape character of the coast. Equally, the range and quality of natural heritage interests and designations along adjacent coastlines could influence the scale and location of any coastal infrastructure required to support these developments.
4. Annex 4 of the Environmental Report lists numerous other initiatives (plans and programmes) that need to be considered in preparing the SEA. This list is comprehensive, but there is no evidence that these initiatives have indeed been considered, in any systematic manner at least, in the development of the recommendations.

Information Gaps and Omissions

5. While the provisions of the Scottish Marine Bill <http://www.scotland.gov.uk/Publications/2008/07/11100221/0> are broadly consistent with those set out in the UK Marine Bill (with the exception of the provisions relating to coastal access), nonetheless we are surprised at the scarcity of references to the Scottish Marine Bill, the measures it contains and to the role of Marine Scotland. The devolution agreement reached in November 2008 gave Scottish Ministers additional responsibilities including outwith 12nm for planning and Marine Protected Areas. We recommend that these arrangements should be described in the SEA so that all those involved, including industry, regulators and statutory consultees, have a clear understanding of the roles and responsibilities in waters adjacent to Scotland. This should help to support more effective marine planning and management in this area.
6. In s5.14.1, the potential for cumulative impacts is recognised between Round 3 windfarm developments >12nm in Scotland and sites leased by the Crown Estate (CE) within 12nm, as part of their leasing round for Scottish territorial waters, a process that was underway but not yet completed when the SEA was published (Jan 2009). Since that time, the location of the successful ‘exclusivity leases’ in Scottish territorial waters has been announced by the CE and there is a potential focus of development immediately inshore of the Round 3 windfarm sites off the Tay and Forth in SE Scotland. As such, there is significant potential for cumulative effects on birds, landscape / seascape and other interests and it is crucial that these are considered in the Post-Consultation report and development of final recommendations.

7. The SEA makes only passing reference to the Crown Estate's leasing round for marine (wave and tide) renewable development in the Pentland Firth and Orkney Waters <http://www.thecrownestate.co.uk/newscontent/92-pentland-firth-tidal-energy-project-2.htm> due presumably to the relatively recent announcement of this. As the SEA was being completed, the Scottish Government let a contract for the preparation of a Marine Spatial Plan for this area intended, in part, to inform marine renewables deployment in the area but also to serve as a model for the Marine Spatial Plans advocated within the Scottish Marine Bill <http://www.scotland.gov.uk/News/Releases/2009/01/28095052> . Although limited to Scottish territorial waters, this Plan could, when completed, have a bearing on the location of future oil and gas exploration activity in this region, if any. As such it is important that dialogue is maintained between DECC and Scottish Government to ensure the respective plans are mutually compatible.

SEA Findings and Recommendations

8. Perhaps because of the volume of work undertaken in the course of the SEA and presented as part of the consultation, the process by which the conclusions and recommendations have been reached is not always obvious and the scientific basis or rationale for the recommendations made not always clear. Similarly, the recommendations do not appear to be presented in any logical or structured manner. A matrix approach (e.g. as advocated in the Scottish Government SEA Toolkit: <http://www.scotland.gov.uk/Publications/2006/09/13104943/0>) would be clearer and would show more transparently how the recommendations have been arrived at.
9. The three industries / activities encompassed by this SEA are not considered separately in the report. Because of the apparent focus of the assessment upon offshore windfarm development, information and recommendations pertinent specifically to oil and gas exploration and to gas storage (the two issues being considered in Scottish territorial waters and hence of particular relevance to us) are hard to discriminate. Indeed it is not clear that there are any specific recommendations relating to gas storage *per se* other than the need to clarify their status under the EIA Regulations. It would have been helpful therefore if separate sections could have been presented summarising the recommendations of the SEA for the three industries / activities concerned in order to better assess their implications for that sector and how these might then be delivered.
10. In the Post-Consultation report to be prepared by DECC following this consultation exercise, we believe that, to encourage ownership and delivery, the recommendations (structured according to sector), are collated into an implementation plan indicating how they are to be taken forward, when and by whom, with clear targets and milestones to facilitate review. Moreover, the monitoring requirements set out in s6.2 should be incorporated within the same plan, again with a clear indication of how and when they will be undertaken, whether by DECC or by others.
11. Twenty-three recommendations are made in s6.1, most of which we support insofar as they apply to Scottish territorial waters¹ but with the following exceptions:
 - a. Rec. 2. This recommendation cites 5 grounds for a presumption against offshore windfarm development. Surprisingly, none of these relate to the natural heritage interest or sensitivity of the site concerned. Although the SEA does not encompass windfarm development in Scottish territorial waters, nonetheless we believe that, as a general principle, a presumption against windfarm development on the basis of natural heritage impact, in certain clearly defined circumstances, should also exist. Indeed, under the Habitats Regulations, there exists, in effect, a presumption against any development that will have an adverse affect upon the integrity of a Natura site.

¹ As above, offshore windfarm development within Scottish territorial waters is outwith the scope of this SEA. Except for the comments herein, which relate to impacts of windfarm development beyond 12nm upon the natural heritage and/or development within Scottish territories, we refer you to the response from JNCC for commentary on the recommendations relating to offshore windfarms and adequacy or otherwise of the approach taken to develop these.

- b. Rec. 4. We note the recommendation (presumably relating only to England and Wales) of a coastal buffer zone of 12nm, for offshore windfarm development. While the principle is commendable, we would not endorse such an approach or figure in Scotland. With greater seascape visibility distances, in many locations, than in England and Wales (table 5.7) there may be circumstances where a greater buffer distance is warranted as, for example, off coastlines of particular landscape or amenity significance such as National Scenic Areas (NSAs) or Coastal Footpaths. Equally, there may be other locations where windfarm development within this buffer distance is acceptable, subject to appropriate mitigation. Accordingly we feel that it is more important in Scotland to determine suitable distances from shore for windfarm development on a site by site basis.
 - c. Rec. 4. SNH supports the recommendation that detailed site-specific information gathering and stakeholder consultation is required before the acceptability of specific major Round 3 wind farm projects can be assessed.
 - d. Recs. 10 and 15. Both of these presume that consent will be given to development in environmentally sensitive areas, subject to appropriate mitigation measures being in place. In practice, depending upon the sensitivity of the site and the nature of the activity planned, developers should be aware that development may, in exceptional circumstances, be refused (e.g. it may not always be possible to identify mitigation that both enables development and meets a site's environmental objectives). Thus while strongly supportive of the sentiments reflected in these recommendations we advise that they should be re-worded to reflect this possibility.
 - e. Rec. 15. With respect to the identification and designation of further offshore SACs and SPA extensions, it is recommended that, "Wind-farm developers should be aware that SAC/SPA designation may necessitate, subject to the conclusions of any appropriate assessment, suitable mitigation measures so as to avoid adverse effects on a designated site or species". While endorsing this, we would emphasise that the same requirements would also apply to the oil and gas and gas storage industries.
 - f. Rec. 20. "Siting and consenting processes for offshore wind farms must remain flexible to allow for technological innovation, including in mitigation measures". Though not directly applicable to Scotland, except insofar as it may apply to Round 3 windfarm developments beyond 12nm, it would be helpful to have further clarification on what this means in practice.
12. We agree with DECC that one of the key potential impacts of future oil and gas exploration is that of acoustic impact from seismic exploration on cetaceans (as well as, potentially, other marine life). We do not, however, agree with the contention that 'neither regional nor local prohibitions on the activities under consideration are justified by acoustic disturbance considerations' (s5.3.6 and elsewhere). There may be areas within Scottish territorial waters, for example within the inner Moray Firth, in which the prohibition of seismic exploration activity is warranted because of the risk to important marine wildlife. We would be happy to discuss this issue further with DECC.

Should you have any queries regarding this response, or wish to discuss any of these matters further, please do not hesitate to contact Dr George Lees of our Coastal & Marine Ecosystems Unit, on 01738 458621, or by e-mail at: george.lees@snh.gov.uk.

Yours sincerely



Ron Macdonald
Head of Policy and Advice

Annex A. Additional Comments Relating To Landscape / Seascape

General comments

SEA OBJECTIVES (Section 3.5). There is one landscape/seascape SEA Objective (page 34), against which the environmental effects of the plan should be assessed. Whilst commendable in its content and aspiration, this Objective has not been used to test the plan through the SEA process. There is no reference, as the SEA progresses, to how it relates to the Objectives.

The SEA INDICATORS stemming from this Objective are unsatisfactory as they will be difficult to monitor. For example how might the “Extent of visual resource potentially affected by the particular developments” be monitored? Definition of the “visual resource” and how it’s “extent” is measured would help to clarify this indicator. Similarly, it would be hoped that through implementation of the recommendations in Section 6 the “Number of areas of landscape sensitivity affected by proposed developments” (indicator 3) would be minimal, so is this a meaningful indicator?

SEA SCOPE Section 3.6 (and page x of non-technical summary) outlines how the various activities necessary for the offshore energy technologies interact with the natural and broader environment. The physical presence of structures and their physical intrusion is mentioned. Their potential to effect changes to landscape/seascape character should also be mentioned.

ASSESSMENT

SNH is content with the SIEVE MAPPING approach taken to the spatial part of the assessment. The two Round 3 wind energy areas identified off Scotland appear to represent areas where offshore wind energy development may be acceptable from a landscape/seascape viewpoint, although this view is subject to more detailed assessment of individual projects and provided that other comments in this response regarding cumulative effects and visibility limits are taken into consideration.

The SUMMARY TABLES in section 5.6 bear no relation to SEA objectives/indicators. There is no evidence that they have been used to test the plan. Also the 5 categories have not been justified, for example, what constitutes a “potential minor positive impact”? There is also no mention of cumulative effects.

Section 6.1 gives RECOMMENDATIONS relating to the findings of the SEA and from a landscape/seascape perspective it is agreed that Alternative 3 (to license but spatially restrict) is the preferred option, albeit with number of mitigation measures to prevent, reduce, and offset significant adverse impacts.

ONSHORE ANCILLARY FACILITIES

The Environmental Report does not consider the onshore impact of ancillary connections, although these are mentioned in the SEA Scope section (3.6 on page 35). It is felt that this can have a significant effect on landscape character of the coast. In Box 5.1 Sources of potentially significant effect, gas storage should be included under the SEA landscape/seascape topic if onshore connections are necessary.

Offshore Oil And Gas

These proposals are for the installation of producer and injector wells, but they are likely to be predominantly sub-sea facilities, well offshore and beyond sight of land. No landscape/seascape/visual impact comment is therefore offered in this response in respect of offshore oil and gas. However, although offshore oil and gas proposals are likely in deeper water than that where windfarms are currently feasible, there may be potential for cumulative effects with offshore wind proposals and these should be assessed on a project level basis.

Gas Storage

Again, no significant landscape/seascape/visual implications are highlighted by the SEA. However, if onshore connections are required, and the SEA is not clear in this respect, recommendations made in the relevant landscape/seascape character assessments should be adhered to.

Offshore Wind

LANDSCAPE/SEASCAPE CHARACTER

SNH is pleased that the Scottish seascapes study (2005) is referenced in the SEA. It should be highlighted, however, that although the seascape units identified within the study are still considered sound, the forces for change and the scenario on which the sensitivity analysis is based should not be used to inform this SEA or the assessment of individual projects.

CUMULATIVE EFFECTS

SNH recognises that the SEA Environmental Report was published prior to the current Crown Estate inshore Award of Exclusivity Agreements in January 2009. It would appear that there is scope for significant cumulative effects of these with the Round 3 wind energy areas identified in the SEA, as 5 of the 10 Exclusivity areas abut or are close to the outer Forth and Moray Firths. These areas are potentially visible from the coast and their interaction requires careful consideration which is not covered in the Recommendations section.

REGIONAL SEAS SUMMARY (Section 5.6)

With respect to landscape and seascape issues, SNH has the following detailed comments on the Regional Seas areas off Scotland;

Regional Seas 1

- No reference is made to long distance paths; e.g. the Southern Upland Way, which is generally walked from west to east which means that at its eastern end there are views towards the sea, the Fife Coast Path or Speyside Way. These are all considerations when considering sensitivity and should be shown on Figure 5.21.
- Coastal local landscape designations in Fife, Forth and Lothians are not referenced.
- The Moray Firth section underplays sensitivity expressed in the afore-mentioned seascapes report, especially in relation to the Beatrice offshore windfarm as a benchmark. The third generation of offshore windfarms will be much larger in all respects.

Regional Seas 6

- Forces for change do not mention the Scottish segment at all.
- The large amount of existing and proposed onshore wind development and tourism aspects need to be highlighted.
- The generally high and medium sensitivity of the seascape needs to be further highlighted.
- There are extensive local landscape designations – regional scenic areas, sensitive landscape areas, AGLV – which are not mentioned in the text.

Regional Seas 7 and 8

- There is no mention of designations in the text for these summaries. National Scenic Areas and Areas of Great Landscape Value cover extensive stretches of the coast in these Regions.



Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR

Date: 21.04.2009

Tel: 0141 614 0420

Fax: 0141 614 0401

By post and by email to sea.2009@berr.qsi.gov.uk

Dear Sir/Madam

Offshore Energy SEA Consultation

ScottishPower Renewables welcome the principal recommendations of the SEA Environmental Report.

The SEA is a comprehensive study and a stand-alone document. Following consultation and finalisation of the document it will prove invaluable to developers and decision makers in the marine environment. However, we are entering into a new era of marine legislation which includes the new Marine Act, marine spatial planning, the MMO, NPS policy guidance and the IPC determining body. National Policy Statements (NPSs) will address **strategic** issues associated with specific types of development and we would be very keen to ensure that these strategic messages are maintained in isolation from the site specific data contained within the SEA. **The spatial aspects of marine development should quite clearly stay with the SEA and eventually the Marine Spatial Plans, and not with the emerging NPS.**

We found the baseline detail of the SEA Report encouraging, however the strategic assessment was found to be inadequate in places.

Our detailed comments are attached, but they key messages are as follows.

- **25GW:** The 25GW Government target of additional UK offshore wind by 2020 is reflected in the Crown Estate Round 3 programme. There is clearly further scope for offshore wind development extending Round 1 & Round 2 sites, new sites (as yet undetermined) within the 12nm coastal waters/the Scottish Territorial Waters and the wider Renewable Energy Zone. This SEA should clearly be limited in application to the Round 3 programme only, with future programmes for offshore wind subject to further SEA as appropriate.
- **12nm buffer:** The rationale behind the definition of the 12nm buffer is unclear and therefore it appears to be an unnatural boundary. The recommendation of a 12nm buffer is not evidence led in the report and the decision for using the limit of 12nm is not fully transparent. Whilst it can be useful to identify clear boundaries for developers, these are only useful when they are fully understood. **It is our opinion that development opportunities do exist within the 12nm boundary.** We therefore recommend that (subject to a

clear rationale) the 12nm boundary could be maintained subject to the understanding that development opportunities may also exist within the 12nm boundary. Each proposal should explain their site selection criteria and should be considered on its merits.

- **Oil and Gas/other users:** Throughout the report there is a clear bias toward oil and gas development over renewables eg. an automatic presumption against development within 6nm and the lack of consideration of the emissions from burning oil and gas. Indeed it is implied in the recommendations of the report that renewables have no right to sterilise seabed while other users are apparently permitted and have presidency (notably renewables have a reasonable defined lifecycle through their lease unlike other industries). It should be recognized that **these industries can co-exist** and there needs to be flexibility in policy to allow this.
- **Shipping:** The Environmental Report has introduced a term 'primary navigation routes' without an explanation of where these are and we have assumed these are more than just IMO designated routes. The Appendix 3 data makes no reference to primary navigation routes. We agree that adequate and safe routes must be maintained for shipping but we strongly suggest the location of these 'primary navigation routes' should be the subject of further investigation and managed in the context of a Marine Spatial Plan, which also considers mitigation and traffic management opportunities.
- **Timing:** The finalisation of the Environmental Report should invoke the requirement to initiate (if not already in progress) the Appropriate Assessment. We are concerned that the lack of information on some of the areas under assessment in the SEA may lead to delay of the AA and therefore Government decision, which influences the Crown Estates R3 process and ultimately may impact 2020 targets. We would also hope that decisions can be made in a timely manner to facilitate early progress on R3.
- **Next Steps:** We are uncertain as to how the Government will translate the findings of the SEA and its decision report into policy. As the Offshore SEA process falls within a period of policy change we are keen to ensure that it is recognised and used as its defined purpose only. We are concerned that the recommendations could be misinterpreted by use in National Policy Statements which would be inappropriate. We do however note the recommendations of the report in terms of the role of marine spatial planning for other potential nature conservation designations and the potential co-use of some areas with energy developments.

Should you require any further information or clarification on this submission, please do not hesitate to contact me.

Yours faithfully,

Gillian Sutherland
Project Manager
ScottishPower Renewables

Offshore Energy SEA Consultation

ScottishPower Renewables Detailed Comments

The following comments are primarily referenced to Section 6.1 of the Environmental Report, followed by general comments.

Reference/ subject	Comments
P213. Recommendations Point 1 Co-ordination	The SEA report favours oil and gas in its assessments with an automatic presumption against development within 6nm around all platforms (which is an aviation issue only). This implies that siting of offshore wind is 'flexible' unlike O/G locations which is obviously not the case. It should be recognized that the industries have the opportunity to co-exist and there should be flexibility to allow this. A good example of this in practice is with onshore wind farms and commercial forestry.
P213. Recommendations Point 2 Assumption against OWF	<p>a. Shipping: The proposed data centre is welcomed and information should be publicly available. We agree with a 1nm limit on Primary Navigation Routes although the definition of a primary navigation route is critical, developers must be kept up to date with progress. The location of the primary navigation routes requires further assessment for mitigation such as potential relocation/realignment and other mitigation options. Mitigation options would have been useful as recommendation eg. Traffic separation schemes. It is unclear in Section 5.7.4 what the source of AIS data is; there is reference to the SEA 2007 AIS data yet the Technical Appendix 3h is based on the 4 week 2008 data. Requires clarification.</p> <p>b. Fishing: No level of strategic significance defined as the assessment automatically assumes a coastal buffer. 'Caution is required' is a bit vague;</p> <p>c. Civilian radar: lack of strategic assessment, can be dealt with in EIA but would have been useful to have overall guidance for plan. We acknowledge the difficulty and would highlight the BWEA sub group on aviation as a key resource for strategic discussions.</p> <p>e. MOD radar: Government need to address with MOD.</p>
P213. Recommendations Point 3 Precautionary Approach	We question the extensive application of the precautionary principle to all uncertain issues, it gives a conservative assessment which can be too vague. Guidance was expected from the SEA looking further into approaches of adaptive management and proportionality. It is subject to misinterpretation. It should be recognised that OWF developers have put a lot of effort into researching issues despite some of them still not being fully understood;

<p>P213. Recommendations</p> <p>Point 4 12nm buffer</p>	<p>The ‘bulk of new generation capacity’ needs to be defined. We acknowledge the potential benefit in defining boundaries however these should not be so prescriptive as to exclude development.</p> <p>The reasoning for the 12nm buffer is not clearly set out and needs to be evidence based. It appears to have been decided and then assessments made retrospectively instead of the assessments defining any spatial restriction.</p> <p>The assessment of the coastal buffer should comment on the residual environmental impact on the key aspects it is designed to mitigate. eg. Given the coastal buffer the landscape impact is insignificant, fishing impact is restricted to large vessels operating outwith 12nm.</p> <p>Looking strategically at the opportunities for wind if there is scope for development then within the 12nm and we would expect the SEA to recognize and identify it, perhaps by stating what capacity is available eg. XGW/or a % within 12nm and/or identifying which regional areas.</p>
<p>P213. Recommendations</p> <p>Point 6 Appropriate Assessment</p>	<p>We are concerned about the process and timing of Appropriate Assessment (AA) for the SEA and impact on the timing of the Government decision and on the R3 Crown Estate process. Assuming that the existing mechanism used for Oil/Gas SEA AA's is adapted, we are concerned that the uncertainties/lack of data from some of the area may hold up the assessment and delay the timescales.</p> <p>We acknowledge the recent news that The Crown Estate will be responsible for undertaking the AA for this SEA and would expect the existing guidance/tools to be utilised (as appropriate) by the appointed body.</p>
<p>P214. Recommendations</p> <p>Points 7/22. Marine Mammals</p>	<p>SPR agree to work closely with JNCC/DECC and their advisors to agree criteria for a cumulative pulse noise ‘dose’. However this approach will require extensive consultation between other operators in region (eg.seismic) with offshore windfarm developers/government advisors and may require difficult choices over programming of activities.</p>
<p>P214. Recommendations</p> <p>Point 8 Waterbirds</p>	<p>Agreed</p>
<p>P214. Recommendations</p> <p>Point 13 Climate Change</p>	<p>In the assessment on CO2 emissions there is a clear omission of data from the burning of oil/gas yet a full life cycle analysis of a windfarm and its impact is included. A stronger argument could be made of benefits from offshore wind in operation, recognising the low operational emissions from operation of wind farms compared to traditional methods of electricity generation.</p> <p>It is inappropriate to omit the environmental impact of extracting and burning 15-25 billion boe of oil and gas (see calculations of CO2 **below) on the basis that it would be imported and therefore burnt anyway as this is still a major environmental impact at a strategic level. Calculations for indicative atmospheric emissions resulting from this SEA programme should have been included.</p> <p>The programme for offshore wind should be framed within the 2020 targets for renewable energy.</p>
<p>P214. Recommendations</p> <p>Point 14 MSP</p>	<p><i>SPR are concerned that the recommendations of the SEA report are not automatically fed into National Policy Statements without due consideration, although notably the NPS should not deal with spatial aspects.</i></p> <p>This infers that renewables is least priority with ‘all’ other users which is concerning.</p> <p>SEA is a valuable tool but the NPS needs to be even more ‘strategic’.</p>
<p>P214. Recommendations</p> <p>Point 15: SPAs</p>	<p>Noted, will keep upto date with consultations and developments, recognising opportunity for development to proceed with appropriate assessment and mitigation.</p>
<p>P214. Recommendations</p> <p>Point 19. Extensions to R2; R1:</p>	<p>Agreed, these require site specific assessments as a separate process.</p>

P110. Shell Flat	For clarification, the sentence “ The proposal to construct the Shell Flat wind farm has subsequently been withdrawn” is misleading and the comment is not required. The project was relocated further to discussions between the developer and statutory agencies and the relocated project was subsequently withdrawn due to other concerns, not birds.
Physical presence (birds)	The reasoning for the 12nm buffer must be clearly set out. The buffer does not adequately reflect the conclusions of the preceding sections, with the reference to other users leading this buffer position. The buffer is a mitigation to reduce impacts but the 12nm limit is not led by bird assessments. We agree that Cumulative Impact Assessment must consider territorial developments and this information should be fed into the Scottish Territorial Waters SEA.
Landscape	The assessment in 5.6 does not clearly set out reasoning for adopting 12nm buffer nor a landscape justification for this (other than it being used elsewhere), indeed it actually states: P.132 ‘The visibility of structures from the coast does not preclude development, and any consideration of coastal ‘buffers’ is perhaps too broad brush to take into consideration many anthropogenic and natural variations along the coast.....’ The assessment lacks conclusion on all influencing factors for the plan. A sensitivity assessment of the coast would have been useful.
Other users- Onshore	The onshore strategic guidance is too vague although appreciated information is limited, particularly on grid. Further guidance on spatial restrictions would have been useful eg. cables through terrestrial designated sites -could have identified highly sensitive coastal areas to avoid. For grid, the SEA does not recognise the alternatives to deployment of 25GW of offshore wind and their impact on the grid eg. still upgrades required.
General	Inconsistent approach to assessment - sometimes prescriptive (eg. MM & noise) otherwise left open ended (shipping); where some areas can only be appropriately dealt with during EIA say so = not a strategic issue, just need to state.
General	It needs to be made clear that the ‘Offshore Energy’ SEA’s recommendations are only for the respective plan/prog ie.additional 25GW by 2020. Any implications for Scotland Inshore and other plans (eg. R4, extensions) should be made with caution. There is a risk of misuse and misinterpretation.
General	It should be recognised that in order to meet the 25GW objective applications for projects greater than 25GW will need to be submitted to achieve it, to account for losses/reductions in projects during the consenting process.
**	With only a very rough calculation and estimate that burning the remaining UK North Sea oil & gas reserves of 15-25 billion barrels of oil equivalent(boe) would release 5.9-9.9 billion tonnes of CO2. This is equivalent to 10-18 years of total UK CO2 emissions at 2005 emissions levels (based on the following). 1 boe = 6.1 GJ of energy (approx) 15-25 billion boe = 91.5-152.5 billion GJ of energy 1 GJ = 0.0175 Tonnes of Carbon (approx) 91.5-152.5 billion GJ = 1.6-2.7 billion tonnes of Carbon = 5.9-9.9 billion tonnes of CO2 [1 tonne of carbon x 44/12 = 1 tonne of CO2] UK 2005 Net CO2 emissions = 554.2 million tonnes

From: Martin Small
Sent: 22 April 2009 18:40
To: sea.2009@berr.gsi.gov.uk
Subject: UK OFFSHORE STRATEGIC ENVIRONMENTAL ASSESSMENT

Dear Sir/Madam,

1.1 The South Downs extend from Winchester to Eastbourne and, together with part of the Western Weald, are currently designated as the East Hampshire AONB and the Sussex Downs AONB, a combined area of 1,374 sq.km. As such, the two AONBs represent one of the largest areas of protected landscape in England. The Sussex Downs AONB reaches the sea at the Sussex Heritage Coast, which include the internationally known Beachy Head and the Seven Sisters. On 31st March 2009 the Secretary of State announced his intention to confirm the designation of the South Downs as a National Park.

The South Downs Joint Committee came into being on 1st June 2005 as a result of an Agreement between the then Countryside Agency and the 15 local authorities across the South Downs. The Joint Committee has taken on the roles of the former Sussex Downs Conservation Board and the East Hampshire AONB Joint Advisory Committee. It therefore represents, for the first time, a single management organisation promoting and facilitating the conservation and enhancement of the South Downs. Set out below are the comments of the Joint Committee on the UK Offshore Strategic Environmental Assessment.

The Joint Committee is generally supportive of the principle of offshore wind energy generation. However, it is concerned at the potential impact of an offshore wind turbine on the Sussex Heritage Coast. The Joint Committee therefore welcomes the recognition of the sensitivity of of this stretch of coastline in the Environmental Report (page 140). The Joint Committee is also concerned at the potential impact of the onshore connection infrastructure, and considers that it is essential that this is taken into account when considering potential or actual proposals for offshore wind energy development. The Joint Committee also considers that the impact of any proposed wind farm on the Seven Sisters Voluntary Marine Conservation Area should be fully assessed, and is concerned that there appears to be no mention of the VMCA in the Environmental Report.

Finally, the Joint Committee considers that the name "Hastings Zone" is misleading, as the zone is the other side of Beachy Head to Hastings. The nearest urban areas to the zone are Shoreham, Hove and Brighton.

Thank you.

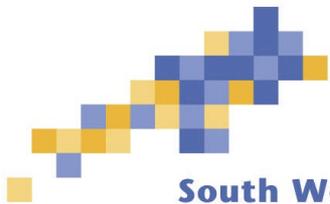
Yours faithfully,

Martin Small

--
Martin Small
Planning & Policy Manager
South Downs Joint Committee
Victorian Barn
Victorian Business Centre
Ford Lane
Ford

Arundel
West Sussex
BN18 0EF

.



South West of England
Regional Development Agency



Offshore Energy SEA Consultation
4th Floor Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

22nd April 2009

Dear Sir,

RE: Offshore Energy SEA Consultation

Summary

Thank you for providing us with the opportunity to respond to this consultation. This is a joint response from the South West RDA and Regen SW, the south west sustainable energy agency.

We are deeply concerned that the proposal for a 12 nautical mile buffer zone, within which major wind farm development “would not normally occur”, will effectively stop development of offshore wind in the South West and in many other regions. Given the central role of offshore wind in increasing renewable energy capacity in the medium term, this would threaten the ability of Government to meet its target of achieving 15% renewable energy by 2020 and will certainly prevent the south west being able to achieve 15% of its energy demand from renewable sources by 2020.

We therefore urge that this proposal, which is presented without any evidence, is removed and that consideration of a suitable distance from shore is done on a case by case basis.

Implications of proposal for a 12 nautical mile buffer zone

Our primary concern with the Offshore Energy SEA Consultation is with regard to the proposed 12nm buffer zone, within which major wind farm development “would not normally occur”.

We fully support sensitive receptors being considered in the development of offshore wind energy as an essential component of sustainable deployment of this technology. However, we believe that buffer zones should only be applied on the basis of suitable evidence. In the absence of that evidence (as is the

case for this SEA), the consideration of suitable distance from shore should be dealt with on a site by site basis.

Although stated as not representing an exclusion zone, the adoption of a 12nm zone – within which development is effectively discouraged – is likely to make consents for offshore wind projects hard to obtain and to deter developers from taking forward projects.

Furthermore, sites within the proposed buffer zone include some of the earliest and most deliverable projects within the programme. The Carbon Trust study referenced by the SEA states that “...Economically, the most attractive sites are those that are near-shore with shallow water and mid-distance, mid depth sites with higher wind speeds.... In order to locate all of the 29GW of capacity on the most economically attractive sites the study suggests that a seaward buffer zone would need to be reduced in some places....”.

The consequences of applying the 12nm buffer zone would be to remove the economically attractive sites for offshore wind turbines. In particular it would eliminate all of the near term opportunities for early development of Round 3 projects which are all located in zones 6, 7 and 8 where the sites are closer to shore and can connect into the existing National Grid transmission system, without the need for extensive grid reinforcement or for untested, high capacity DC links.

Of particular concern is that the buffer zone would remove both sites within the south west England region (Zone 7: West Isle of Wight and Zone 8: Bristol Channel) fall primarily within 12 nautical miles with only deep waters falling outside this limit. Thus the south west will be significantly affected by this proposal with the likely result that no offshore wind will be developed in the south west under Round three.

In summary, the consequences of the 12 nautical mile buffer zone are:

An inability to deliver national targets:

- Over reliance on zones which require significant investment in infrastructure is likely to result in failure to deliver within the 2020 timeframe.
- An unrealistic assumption that nearly 60% of the 25GW target for Round three could be developed in the Southern North Sea, the majority of which would be in the zone three (a proposed SAC).
- Total dismissal of three zones which could be developed quickly due to existing grid infrastructure and close proximity to shore.

An inability to deliver regional targets:

- Regen SW’s analysis in the Road to 2020 clearly demonstrates the huge importance of offshore wind. Without zones seven and eight being taken forward in Round three, the region will NOT be able to meet a 15% renewable commitment.

Flaws in the SEA

We are also concerned that the SEA proposes a 12nm buffer zone with no evidence and with no consideration of the economic implications.

Offshore wind brings with it significant economic opportunities. For example, a project in the Bristol Channel zone may bring additional GVA of over £30m per annum to the region in terms of the operations and maintenance alone - in addition to the obvious benefits that construction of the project would bring.

There are also significant potential synergies with wave and tidal energy, which would not be realised within the region if offshore wind development is prematurely constrained. The wave and tidal sector has the potential to bring substantial benefits to our region and the UK in the longer term, but is currently in its infancy and is thus particularly sensitive to such risks and precedents.

In summary we believe the SEA does not make the case for a 12 nautical mile limit due to:

Insufficient evidence:

- There is no clear evidence put forward in the SEA to justify the 12 nautical mile threshold. "*the relative sensitivity of multiple receptors in coastal waters...*" does not constitute evidence.

Failure to follow due process:

- The SEA failed to complete a comprehensive assessment of the costs and benefits of offshore wind in comparison to other marine activities and interests as required, resulting in an unfounded precautionary approach being adopted.
- There has also been no consideration of the economic consequences of applying this recommendation.

Background: Renewable Energy in South West England

South West England is a leading region in terms of developing a low carbon economy. Within the South West Regional Economic Strategy 2006-2015, Environmental Technologies (including Renewable Energy) is identified as one of the eight priority sectors selected for specific intervention. The region was the first in England to set up a dedicated sustainable energy agency (Regen SW).

DECC's 2008 Renewable Energy Strategy Consultation recognises RDAs as playing "a significant role in the contributing to the development and delivery of national energy policy at regional level". The South West RDA's Corporate Plan 2008-2011 sets out three strategic priorities: Productivity-led growth, Priority Places, and Growth within Environmental Limits.

The south west sustainable energy agency, Regen SW, has primary objectives to deliver megawatts and jobs by supporting the sustainable energy sector. The south west region was the first European region to analyse how we could deliver on the government's obligations stemming from the EU directive. Regen SW produced the Road to 2020 report, which clearly demonstrates how the region could achieve 15-20% of its energy demand from renewable energy. This relies on a significant contribution from offshore wind.

Thus the development of offshore wind energy is a strategic priority for South West England, both in terms of the development of a low carbon economy and in meeting our share of the 2020 renewable energy targets.

Yours sincerely

Claire Gibson
Director of Sustainable Resources
South West RDA

Merlin Hyman
Chief Executive
Regen SW

Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen
AB11 6AR

21st April 2009

Dear Sir

Consultation response to the Offshore Energy SEA Environmental Report

The SEA Environmental Report is, in the main, a comprehensive document setting out the range of environmental issues relating the future leasing of offshore sites for the development of wind farms and the licensing of offshore gas and oil extraction. The SEA will have an important influence on the Government's view on the future of the Round 3 zones (including the achievement of renewable energy and climate change targets), the formulation of evolving renewables and marine policy, and the development and subsequent consideration of development order applications made to the IPC.

Our principal concern relates to the message throughout the document indicating a preference for projects beyond a 12nm coastal buffer and implication that those within 12nm should expect to have to undertake more detailed assessment and stakeholder consultation.

It is our view that the report is unclear as to why the specific distance of 12nm has been selected and lacks sound technical justification for promoting it. It is noted that this distance marks the extent of territorial waters and that there is limited correlation with international offshore wind farm experience. However the validity of applying European case studies to the situation in England and Wales is questionable and it needs to be acknowledged that the leases that the Crown Estate will enter into in Scottish waters will be for wind farms within 12nm of the Scottish coast. The Government therefore needs to consider the rationale for buffering based on this report and the implications for three of the Round 3 zones and the Scottish situation. Adhering to this buffer without good reason or clarification could have significant cost implications for the consortia bidding for zones wholly or partly within 12nm of the coast, the consortia offered the leases and the subsequent achievement of the Governments targets.

Whilst the SEA suggests 12nm as the appropriate distance for a coastal buffer, it also highlights that each zone should be assessed on its own merits. Somewhat ambiguously it suggests that in some areas, projects within 12nm would be acceptable, and that in other locations a coastal buffer in excess of 12nm may be

justified. It would appear that the SEA attempts to provide flexibility on the point of buffer distance, however, if this is the aim, it is questionable as to why the distance of 12nm is specifically mentioned throughout the text. This is of particular concern where, at several points, text states “...a coastal buffer zone of 12 nautical miles (some 22km) is recommended, within which major wind farm development would not normally occur.”

The SEA document references the 12nm threshold within the sections on the following issues: landscape and visual, ecological, shipping, and recreation and tourism. These issues are considered in the following paragraphs.

The potential landscape/seascape and visual effect is presented in the SEA as a key driver behind the setting of the 12nm coastal buffer. This appears to be contrary to the DTI Guidance on the assessment of impact of offshore wind farms and also to the development distances relating to the sensitivity of seascape units set in the Round 2 SEA.

The DTI Guidance suggests that for 150m turbines, a major visual effect is likely to occur within 7nm of the coast, between 7nm to 13nm a moderate effect is anticipated and beyond 13nm a minor effect is possible. Similar distance categories were set for minimum offshore limits for wind farm development for each seascape unit during Round 2, (with reference to CCW Guidance and consultation) at 8km (4.33nm), 13km (7nm) and 24km (13nm) for high, medium and low sensitivity of seascape units respectively.

The threshold of 12nm falls within the zone considered by guidance to have a moderate effect on landscape/seascape and visual receptors, which suggests this level of effect is deemed to be potentially acceptable. On this basis, it is unclear why development within any part of the ‘moderate effect’ zone (i.e. between 7nm and 13nm) is not potentially acceptable. For example why is 12nm considered more appropriate than 7nm or 10nm? (10nm being a mid point in the 7nm to 13nm zone). If the SEA was seeking to minimise visual impacts, based on current guidance why wasn’t the threshold set at 13nm? (the threshold between potential moderate effect and minor effect). An absence of evidence within England and Wales from Round 1 and 2 (which we understand to be part of the justification for departing from earlier advice) to support the 12nm buffer on the grounds of landscape and visual effect tends to make the professional justification of the distance on this basis challenging and suggests that 12nm has been chosen more for administrative than sound technical or environmental reasons. It is accepted that some seascapes will be more sensitive than others, and that individual projects will need to assess this in their environmental impact assessments, however a general 12nm buffer whether proposed or implied is unjustified for all coastal areas.

With regards to the ecological basis of the 12nm buffer, it is accepted that for some species there is likely to be more significant interest in shallower coastal waters. However, for other species, such as some cetaceans and seabirds, there is a preference for deeper water such as that found beyond 12nm. The current limited knowledge of marine ecology beyond 12nm, combined with the proposed ecological designations of

marine areas significantly further offshore (such as Dogger Bank) should re-emphasise the unsuitability of a 12nm coast buffer cited for ecological reasons.

The specific conditions (water depth, tidal flow, temperature, seabed habitat etc) required by many important marine species means that it is especially important that each potential development site be assessed on its own merits and the use of a generic buffer is avoided. It appears that the territorial waters extent has been inappropriately adopted as the definition of 'coastal waters' in an ecological context, although professional justification reflecting the significance of ecological interest specifically within 12nm is tenuous.

The SEA implies that projects within 12nm will require additional assessment and stakeholder consultation due to their proximity to the coast, yet it also states that each location should be assessed on its own merits. It is the site-specific EIA scoping process as opposed to generalisations of the SEA that should identify the range and level of detail of assessments. The EIA scoping identifies important environmental factors that are most likely to be affected by the scheme, ensuring that all potentially significant effects are taken into account and that only those that are likely to be significant are examined in detail. In addition, the implication that a project within 12nm should undergo more detailed or more extensive public consultation appears to be without foundation. This creates unnecessary ambiguity, may result in increased costs (time and money) for developers within the 12nm zone and appears to be at odds with the recently published consultation guidelines for Nationally Significant Infrastructure Projects, which does not advise different scales of engagement for different projects.

With respect to shipping, recreational and tourism interests, whilst the SEA report notes that generally the inshore zone is busy and crowded in places we are concerned that this is used as a further justification to encourage wind farms to locate beyond 12nm. If the public can't visually distinguish between 10nm, 12nm, 14nm (or rather that it would in most cases be difficult to identify a significant difference between projects at these distances) we are unsure why this is identified as an issue for tourism and recreation. Sailing, fishing and shipping can co-exist and have no rights to the use of the water. Therefore we are unsure why the SEA gives prominence to these sectoral interests over the wider benefits of climate change and renewable energy generation. In certain cases and locations these interests may be important however the relevant place to assess significance is in the environmental impact assessment and the place to weigh the competing interests is in the planning determination.

It could be argued that under the SEA, the three zones within the Round 3 process where all or part of the zone lies within 12nm are significantly disadvantaged with regards to development potential.

We are concerned that some key consultees and individuals will use the SEA as justification to consider the '12nm buffer zone' as an exclusion zone. This will be a particularly unwelcome problem for the developers of the three zones: Bristol Channel, West of Isle of Wight and Hastings, to manage.

A further unwelcome response to this threshold, particularly if it is given enhanced status following the Governments response to the SEA and / or finds its way into the

National Planning Policy Statement on Renewables, could be to force development further out into deeper water increasing the engineering challenge, construction risk and costs. In the case of the Bristol Channel, West of Isle of Wight and Hastings zones this may have significant effects on project viability, which in turn will result in the Government failing to achieve its stated renewable energy and climate change targets. For this reason we urge very careful consideration to be given to the need for any buffer to be proposed or inferred as an outcome of this SEA.

Yours faithfully



Adrian French
Director

Consultation on the 'UK Offshore Energy Strategic Environmental Assessment Environmental Report: Future Leasing for Offshore Wind Farms and Licensing for Offshore Oil & Gas and Gas Storage'

Consultation response to the Department of Energy and Climate Change from The Crown Estate

April, 2009

Summary

- The Crown Estate is committed to working with Government and all stakeholders to help ensure that the aspirations of the UK for offshore renewable energy are met.
- There is excellent potential within UK waters for wind and marine renewable energy deployment to help mitigate the effects of climate change and assist in the security of UK energy supply.
- It is expected that The Crown Estate's Round 3 offshore wind leasing programme will provide 25GW of additional renewable energy generating capacity by 2020. Round 3 is, therefore, a strategically important initiative in the context of Government's targets for offshore renewable energy and achieving transition to a low carbon economy.
- The greatest challenge to the delivery of Round 3 is building and maintaining business confidence which in turn leads to the necessary level of investment required to plan and construct offshore wind farms, associated infrastructure and the supply chain. Ensuring that the strategic planning framework is established in a clear, robust and timely fashion is an important driver of confidence in the development of offshore renewables. In this respect it is important that the plan for UK Offshore Energy does not restrict the development of offshore wind farms any more than is necessary to avoid significant adverse environmental effects.
- In this context the Environmental Report is welcomed by The Crown Estate as an important step to ensuring that a robust strategic planning framework is in place to underpin the further development of offshore renewables and gas storage in the UK. Government's decision on the plan for UK Offshore Energy should seek to maximise the potential for the sustainable development of these strategically important energy resources and our comments are intended to inform that decision.
- The recommendations of the Environmental Report are broadly supported, although The Crown Estate believes that the 12nm Coastal Buffer identified in Recommendation 4 is undesirable and unnecessary, for the following reasons:

- If rigidly interpreted it is too prescriptive and may prejudice future strategic planning policies such as, for example, National Policy Statements under the Planning Act 2008 as well as marine spatial planning proposals under the Marine and Coastal Access Bill.
- The assessments in the Environmental Report do not lead to the conclusion that a 'blanket' 12nm Coastal Buffer is the best way to manage potential impacts of offshore wind farm development on interests such as landscape and seascape, ecology or shipping. Emphasis should instead be placed on the need for more detailed case-by-case, site-specific assessment of the potential environmental and technical implications of proposed wind farm developments in line with the variable nature of landscape, ecological and other economic uses of British coastal waters.
- If Government is minded to adopt a Coastal Buffer as indicated in Recommendation 4 then its intent should be unambiguous. As written, it does invite different interpretations (largely due to slightly different wording in the Non-Technical Summary and Section 6.1). It should be made clear that the intention is that the bulk of the 25GW of additional offshore development is delivered outwith inshore waters rather than there being a restriction on the size of any specific development that may be located within those inshore waters.
- With respect to Recommendation 19 (extensions to Round 1 and 2 sites), our view is that the emphasis should be on site specific investigations. It is not helpful to generalise the restrictions that might apply to the extensions of these existing sites. We do not agree that, in all cases, the most appropriate direction of extension would be to seaward nor that it is unlikely that Round 1 sites would be extended.
- It is our view that it is entirely reasonable (and consistent with the purpose of SEA) to suggest that future, more detailed, technical and environmental investigations for proposed developments close to the coast is acceptable. In this regard we suggest that the unnecessary restrictions contained in Recommendations 4 and 19 are removed and that the wording of Alternative 3 be amended to provide greater flexibility, for example: "To restrict the areas offered for leasing and licensing temporally or spatially **unless detailed technical and environmental investigations prove that such restriction is not warranted**".
- The Environmental Report emphasises the strategic importance of Dogger Bank for future offshore wind farm development. It should be noted that there are proposals to include large sections of Dogger Bank within the Natura 2000 network (as a Special Area of Conservation). The Crown Estate has separately provided input to the Impact Assessment for this proposed designation emphasising the strategic and economic importance of Dogger Bank. Although it is recognised that socio-economic interests are not a material consideration in the designation of Natura 2000 sites, the strategic importance of this region for renewable energy emphasises the need for a strong evidence base underpinning designation and the need for a high level of certainty about the interest features for which it is potentially designated and their conservation objectives.

Supporting information

1. The Crown Estate

The diverse portfolio of The Crown Estate comprises marine, rural and urban properties across the whole of the United Kingdom valued in total at over £7 billion (2006 / 07 figures). Under the 1961 Crown Estate Act, The Crown Estate is charged with maintaining and enhancing both the value of the property and the revenue from it consistent with the requirements of good management. We are a commercial organisation guided by our core values of commercialism, integrity and stewardship.

The Crown Estate's entire revenue surplus is paid directly to HM Treasury for the benefit of all UK taxpayers; in 2006 / 07 this amounted to £200.1 million.

Our Marine Estate comprises virtually the entire UK seabed out to the 12 nautical mile territorial limit, in addition to the sovereign rights to explore and make use of the natural resources of the UK continental shelf, with the exception of oil, coal and gas. We own approximately 55 per cent of the foreshore and around half the beds of estuaries and tidal rivers in the United Kingdom. A wide variety of businesses and organisations conduct economic and conservation activities across our Marine Estate, with an estimated total value of some £46 billion providing almost 890,000 jobs. Over 20% of our coastal estate is leased out to conservation bodies.

The Crown Estate manages its marine assets on a commercial basis, guided by the principles of sustainable development and social responsibility. We take a consistent approach to the management of our activities around the UK, whilst retaining flexibility to take local factors into account whenever necessary.

The Crown Estate can bring to bear an unparalleled level of knowledge and expertise on issues relating to management of the foreshore, the territorial seabed and continental shelf. This knowledge includes marine resource management (e.g. marine aggregate extraction, marine renewable energy installations, seabed infrastructure, aquaculture and new activities such as gas storage and carbon capture and storage) and its interplay with other marine activities such as defence, energy, navigation and marine safety. We have a strong understanding of the needs of a broad range of sea users, as commercial partners, customers and stakeholders.

2. Round 3

On 4 June 2008 The Crown Estate (TCE) announced proposals for the third round of offshore wind farm leasing to deliver up to 25GW of new offshore wind farm sites by 2020 (hereafter referred to as "Round 3"). TCE has subsequently invited potential development partners to bid for one or more of nine (9) Development Zones, identified through the Marine Resource System (MaRS) by the Crown Estate. These zones will be finalised following the Government's decision on the SEA, once DECC has considered comments received during the public consultation and published a Post Consultation Report, and subject to the outcomes of any Appropriate Assessment that may be required.

3. The Crown Estate's Response

Our comments focus on those aspects of the report and its recommendations that relate to offshore wind energy.

In this respect the Environmental Report is welcomed by The Crown Estate as an important step to ensuring that a robust strategic planning framework is in place to underpin the further development of offshore renewables and gas storage in the UK. Government's decision on the plan for UK Offshore Energy should seek to maximise the potential for the sustainable development of these strategically important energy resources and our comments are intended to inform that decision.

We have three key comments on the Environmental Report:

1. The recommendations of the Environmental Report with respect to offshore wind energy are broadly supported with the following exceptions:
 - **Recommendation 4.** The case for a 12nm Coastal Buffer is not adequately made and the intent of this recommendation is not, in any case, clear. Our key concerns are:
 - If rigidly implemented it is too prescriptive and may prejudice future strategic planning policies such as, for example, National Policy Statements under the Planning Act 2008 as well as marine spatial planning proposals under the Marine and Coastal Access Bill.
 - The assessments in the Environmental Report do not lead to the conclusion that a 'blanket' 12nm Coastal Buffer is the best way to manage potential impacts of offshore wind farm development on interests such as landscape and seascape, ecology or shipping. Emphasis should instead be placed on the need for more detailed case-by case, site-specific assessment of the potential environmental and technical implications of proposed wind farm developments in line with the variable nature of landscape, ecological and other economic uses of British coastal waters.

Further more detailed comments on the proposed Coastal Buffer are included below in Annex A.

- **Recommendation 19.** It is our view that it is not helpful to generalise the restrictions that might apply to the extensions of Round 1 and 2 sites. It is not clear to The Crown Estate that, in all cases, the most appropriate direction of extension would be to seaward nor that it would be unlikely that Round 1 sites would be unlikely to be extended. It is our view that, in light of the diverse settings of existing sites, that the emphasis should be on site specific investigations.
2. It is our view that it is entirely reasonable (and consistent with the purpose of SEA) to suggest that future, more detailed, technical and environmental investigations for proposed developments close to the coast is acceptable. In this regard we suggest that the unnecessary restrictions contained in Recommendations 4 and 19 are removed and that the wording of Alternative 3 be amended to provide greater flexibility. An example of how this might be achieved is provided below (additional wording underlined):

“To restrict the areas offered for leasing and licensing temporally or spatially **unless detailed technical and environmental investigations prove that such restriction is not warranted**”.

3. Our final point relates to the potential effect of the proposed designation of Dogger Bank as a Special Area of Conservation (SAC). The Environmental Report emphasises the strategic importance of Dogger Bank for future offshore wind farm development. It should be noted that there are proposals to include large sections of Dogger Bank within the Natura 2000 network (as a Special Area of Conservation). The Crown Estate has separately provided input to the Impact Assessment for this proposed designation emphasising the strategic and economic importance of Dogger Bank. Although it is recognised that socio-economic interests are not a material consideration in the designation of Natura 2000 sites, the strategic importance of this region for renewable energy emphasises the need for a strong evidence base underpinning designation and the need for a high level of certainty about the interest features for which it is potentially designated and their conservation objectives.

4. Closure

The greatest challenge to the delivery of Round 3 is business confidence which in turn leads to the necessary level of investment required to plan and construct offshore wind farms, associated infrastructure and the supply chain. Ensuring that the strategic planning framework is established in a clear, robust and timely fashion is an important driver of confidence in the development of offshore renewables. In this respect it is important that the plan for UK Offshore Energy does not restrict the development of offshore wind farms any more than is necessary to avoid significant adverse environmental effects.

We trust that you will find these comments constructive. We would be very willing to provide Government with additional information on any of the points we have raised above and be very pleased to discuss these matters with you further. All of this response may be put into the public domain and there is no part of it that should be treated as confidential.

5. Contact

Dermot Grimson, Head of External Affairs
The Crown Estate

16 New Burlington Place
London, W1S 2HX.
Tel. 020 7851 5000

dermot.grimson@thecrownestate.co.uk

Annex A: Detailed Comments on the Proposed Coastal Buffer

1. Rationale for the Coastal Buffer

Whilst sensitivity associated with landscape / seascape and bird interests appear to be the main drivers for Recommendation 4, the Environmental Report also indicates that restriction of development within 12nm would also mitigate potential effects on the navigation of small fishing and non-commercial vessels, commercial fishing activity, tourism and recreation.

The Environmental Report itself clearly caveats that there may be scope for offshore wind development within 12nm, and conversely, that a Coastal Buffer in excess of 12nm may be justified for some areas / developments. It would be desirable, in light of the quantity of information assembled during the SEA that there was greater clarity about where these areas might be located.

We are concerned that a blanket Coastal Buffer is too prescriptive at the SEA level and would prejudice future strategic planning policies (for example in the drafting of National Policy Statements under the Planning Act 2008 as well as marine spatial planning proposals under the Marine and Coastal Access Bill) which would both benefit from a more fine-grained consideration of spatial planning issues.

We would prefer that reference to a 12nm Coastal Buffer be replaced with a statement of the need for more detailed case-by case, site-specific assessment of the potential environmental (e.g. bird sensitivities, landscape / seascape effects) and technical (e.g. navigational routes and safety) implications of wind farm developments that are closer to the coast.

The Environmental Report includes various references to the need for a Coastal Buffer and we include some specific comments on these references which collectively form the rationale for Recommendation 4.

1.1. National Policy

Section 5.7.3 of the Environmental Report makes specific reference to a number of national policies in its consideration of a Coastal Buffer, namely the policies contained within:

- Planning Policy Guidance Note 20: Coastal Planning (PPG20); and
- Planning Policy Statement 22: Renewable Energy (PPS22).

It is not clear that the policies contained in PPG20 are relevant to the consideration of the planning of offshore wind farms (although it is recognised that PPG20 may be relevant to certain onshore development e.g. substations).

For planning purposes as a general rule, the limit of the coastal zone in the seaward direction is mean low water mark. Above mean low water mark, local planning authorities have powers to control the development and use of land under the Town and Country Planning Act 1990 (paragraph 1.6. Decisions on development proposals below mean low water mark are generally outside the scope of the planning system, although they are subject to control by a number of agencies, usually related to the type of activity (paragraph 1.9).

Likewise, as the land use planning system does not generally extend beyond Mean Low Water Mark (MLWM), the policies contained in PPS22 do not extend to developments for offshore renewables. The relevance of PPS22 in the consideration of a 12nm Coastal Buffer is therefore questionable. Nevertheless, TCE does acknowledge the importance of national designations and that the siting of offshore wind farms should not compromise the objectives of designation of the area. However, at SEA level, TCE does not consider that it is possible (or warranted) to determine whether the development of offshore wind farms will compromise these objectives. Realistically this can only be ascertained through case-by-case, site-specific investigations and rigorous assessment against the objectives of designation of the area.

1.2. Landscape / Seascape

The potential adverse effects of offshore wind farm development on landscape / seascape are expressed as a concern in the Environmental Report. As stated in the Non-Technical Summary (p. xiii):

The major development of offshore wind farms envisaged by the draft plan / programme could result in significant effects on landscape / seascape...The assessment has considered the theoretical maximum visibility of offshore wind turbines (of a range of sizes and heights) during day and night based on curvature of the Earth, the relative effectiveness of the 8 and 13km seascape buffers adopted in the Round 2 SEA, based on evidence from Round 1 and 2 developments, the relative sensitivity of the coast and hinterland based on protected / valued landscape designations, and international practice in wind farm siting. Significant adverse effects are likely without mitigation; however, for a variety of impact reduction reasons a general guideline of a 12 nautical mile buffer zone is recommended for large (>100MW) wind farm developments. This is not to exclude wind farms from being built closer to shore but to reduce conflicts with a range of ecological and other receptors (including landscape / seascape) and avoid potential public opposition and extended consenting timescales.

Section 5.6 of the Environmental Report subsequently provides a thorough account of the three principal considerations for an assessment of the likely impacts of wind turbines on the seascape / landscape of the UK coastline: the limit of visual perception from the coast (i.e. are the turbines visible and what influences their visibility); the individual characteristics of the coast which affect its capacity to absorb a development; and, how people perceive and interact with the seascape.

It is unclear how the analysis in Section 5.6 leads to the recommendation for a blanket 12nm (~22km) Coastal Buffer. We would argue that the issues identified below (extracted from Section 5.6) imply the need for a more fine-grained approach to landscape and seascape:

- The Environmental Report identifies that the nacelle of a 160m turbine at 25-30m from the coast would still be visible (Section 5.6.1.1). Table 5.6 also indicates that, at sea level, the theoretical viewable distance to nacelle of a 160m turbine with a 90m diameter rotor is 26km, and the theoretical viewable distance to blade tip of that turbine is 49km. This does not account for the influence of haze and other meteorological factors on viewable distance.
- Section 5.6.3 of the Environmental Report also states that “the 35km buffer represents an indicative maximum actual visibility based on the studies discussed above, though this is not

necessarily as far as an individual may be able to see... The visibility of structures from the coast does not preclude development, and any consideration of coastal 'buffers' is perhaps too broad brush to take into consideration the many anthropogenic and natural variations along the coast (at local to regional scales) and the variety of development scenarios which might take place (e.g. height, pattern of turbines). What determines the capacity of a stretch of coastline to accommodate a given development scenario is people's perception of the view. This may be controlled by whether turbines are viewed from an urban or industrial landscape or a more remote or 'wild' area, the occupation of the viewer and their motivation for being in the viewing location (e.g. work, leisure), and indeed where the context of the coast and turbines meet (e.g. leisure craft travelling on coastal routes will have intervisibility with the coast and sea)."

- Table 5.10 identifies the distance from shore of a number of offshore wind farms (with turbines of varying size) that have been approved or constructed in the Baltic and North Seas. TCE believes that it would be beneficial for a similar analysis to be undertaken of UK constructed and approved offshore wind farms. In addition, some consideration of UK attitudes towards offshore wind farm development would be useful. Some discussion of attitudes towards renewable energy is provided in Section 5.6.5 which states *"surveys of awareness and attitudes to renewable energy, specifically onshore wind, indicate that people are generally in favour of the use of renewables, including wind power, indicating that the general population perceives advances in renewables as necessary (possibly linked with perceptions / knowledge relating to climate change / depleting hydrocarbon reserves)"*.
- Offshore wind farms are likely to be visible in the context of other existing wind farms, and other marine users such as commercial shipping and fishing vessels and a range of smaller recreational craft.
- Section 5.6.5 of the Environmental Report recognises that the characteristics which determine the 'compatibility' or degree to which a wind farm development alters or harmonises with the character of a seascape in which it is observed are highly variable at the regional and local scale and are difficult to account for in a comprehensive manner at a strategic level.
- The potential effects on landscape / seascape will be considered by decision-makers in the context of other likely significant effects. For example, potential medium adverse effects of offshore wind farms on landscape / seascape (Table 5.8 indicates that average distance where 'medium' magnitude of effect occurred for Round 1 and 2 sites is 14.2km for 5-6MW turbines) should be weighed against the substantial environmental and socioeconomic benefits of increasing renewable energy generation on a national scale, with consequent reductions in carbon dioxide emissions.

1.3. Bird Sensitivities

The Environmental Report expresses concerns over the potential adverse effects of offshore wind farm development on bird sensitivities. As stated in the Non-Technical Summary (p. xiii):

Overall, the assessment of these effects concludes that based on available evidence, displacement, barrier effects and collisions are all unlikely to be significant to bird populations at a strategic level.

However, there are some important uncertainties in relation to bird distribution, variability in migration routes and timings, the statistical power of monitoring methods, and the sensitivity of this conclusion to modelling assumptions (notably avoidance frequency in modelling of collision risk and several important factors in modeling of population dynamics). Therefore, recognising that a large proportion of the bird sensitivities identified are concentrated in coastal waters, a coastal buffer zone of 12 nautical miles (some 22km) is recommended, within which major wind farm development would not normally occur.

Notwithstanding the uncertainties identified above, there is a growing body of information about the distribution of bird populations around the British coastline, particularly those that are likely to be of strategic importance, such as breeding colonies of seabirds, wintering aggregations of seaduck and divers and the migratory routes of some species. As with landscape this issue would have benefited from a more fine-grained treatment which reflects the uneven distribution of bird interests around the British coastline rather than the imposition of a blanket restriction.

2. Definition of the buffer

If Government is minded to adopt a Coastal Buffer as indicated in Recommendation 4 then its intent requires clarification. Recommendation 4 (section 6.1, page 214) includes the following passage:

Reflecting the relative sensitivity of multiple receptors in coastal waters, this report concludes that the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km). The proposed coastal buffer zone is not intended as an exclusion zone, since there may be scope for further offshore wind development within this area, but as mitigation for the potential environmental effects of development which may result from this draft plan / programme. The environmental sensitivity of coastal areas is not uniform, and in certain cases new offshore wind farm projects may be acceptable closer to the coast. Conversely, a coastal buffer in excess of 12nm may be justified for some areas / developments...

In the Non-Technical Summary, however, under the sub-heading “Landscape / Seascape” the following point is made:

... for a variety of impact reduction reasons a general guideline of a 12 nautical mile buffer zone is recommended for large (>100MW) wind farm developments. This is not to exclude wind farms from being built closer to shore but to reduce conflicts with a range of ecological and other receptors (including landscape/seascape) and avoid potential public opposition and extended consenting timescales.

Although these passages are inconsistent in the way they describe the nature of the Coastal Buffer, it is our understanding that the intent is actually to direct the majority of new wind farm construction, as opposed to large wind farms, *per se*, away from inshore areas where there is a greater concentration of environmental sensitivity and competing uses.

It is important that this proposed restriction is clearly articulated because whilst the Round 3 leasing programme is expected to deliver the bulk of the capacity beyond 12nm it does also include several development zones (including both of those proposed on the south coast of England) that are wholly or partly located within 12nm.

It is also important that the intent is made clear so that future planning activities, including the formulation of relevant National Policy Statements and Marine Spatial Planning (as foreshadowed by the Marine and Coastal Access Bill) are not prejudiced.



**UK Offshore Energy Plan
SEA for Offshore Oil and Gas Licensing and Wind Leasing
Environmental Report Consultation**

**Response by
The Royal Society for the Protection of Birds
22 April 2007**

Contact: Mariam Ali, Planning Policy Officer (Environment)
Organisation: The Royal Society for the Protection of Birds
Address: The Lodge, Sandy, Bedfordshire, SG19 2DL
E-mail address: mariam.ali@rspb.org.uk
Telephone number: 01767 693486

About the RSPB

The Royal Society for the Protection of Birds (the RSPB) is the charity that takes action for wild birds and the environment. We are the largest wildlife conservation organisation in Europe with over one million members. We own or manage approximately 135,000 hectares of land for nature conservation on 200 reserves throughout the UK.

The RSPB's commitment to renewable energy

The RSPB believes that climate change is the greatest long-term threat faced by people and biodiversity. Without rapid action to reduce greenhouse gas emissions, one third of all land based species may be committed towards extinction by 2050. We have welcomed the UK Government's plans to cut emissions by 80% by 2050 and we support the Government's pledge to deliver the UK's share of the EU renewable energy target for 2020. The UK Government's Renewable Energy Strategy has proposed that, to contribute its fair share to the target, it will seek to generate 15% of its energy (and up to 40% of electricity) from renewable sources. This will require a revolution in the way that we generate and use energy. The RSPB advocates that this revolution should take place in a way that minimises damage to the natural environment based on a mix of technologies as well as demand reduction and energy efficiency.

Given this context, the RSPB supports government's aspirations to generate 33GW of renewable electricity from Offshore Wind Farms by 2020.

The role of the UK Offshore Energy Plan SEA

The role of this Strategic Environmental Assessment (SEA) process is to ensure that environmental considerations are incorporated into the Draft Plan so that the Government's 33GW target is delivered with minimal impacts on the marine environment. Although SEA is a regulatory process, and not a policy process for UK renewables, we believe it has a critical role to play in filling information gaps to support both the assessment of the Draft Plan and the faster delivery of a Marine Protected Areas (MPA) network and future marine plans.

The forthcoming system of marine spatial planning will play a valuable role in providing a joined-up process by which conflicts between present and future offshore energy developments can be resolved. In the meantime, this SEA process should serve the industry and the marine environment by playing a strategic role in helping to determine that areas which have been licensed stand a good chance of receiving consent at the project stage, and in identifying how any adverse impacts of future developments can be reduced and any positive outcomes enhanced.

Introduction

The RSPB welcomes the Strategic Environmental Assessment (SEA) of the UK Offshore Energy Plan ('Draft Plan') covering the implications of further wind farm leasing, oil and gas licensing, and gas storage licensing in UK waters. Overall, we agree with the SEA's conclusion that there are no overriding environmental considerations that would preclude the UK Offshore Energy Plan from being adopted, given adequate avoidance and mitigation of potentially significant effects. However, we consider that significant displacement, barrier and collision effects on birds cannot be ruled out in the absence of a strategic-level Cumulative Impact Assessment (CIA) of the offshore wind element of the plan.

While the Environmental Report (ER) successfully collates large amount of data, it fails undertake a robust assessment and i) evaluate a wide range of spatial alternatives for each activity, ii) undertake a satisfactory assessment of likely cumulative effects, particularly for birds, and iii) adopt a rationale for judging the significance of effects. Moreover, the recommended avoidance and mitigation measures are inadequate to address potentially significant effects, particularly for birds.

The RSPB is seriously concerned that no Appropriate Assessment of the Draft Plan has been carried out to date, despite our advice that this would be required. We are of the opinion that the proposals may have a likely significant effect on Special Protection Areas and their bird populations, and that a strategic AA, based largely on the data compiled for the SEA is possible.

We would welcome the opportunity to discuss our comments further, in particular, the detailed recommendations made below.

Structure of this response

Key issues, data needs and recommendations are summarised below. Further below, we make detailed comments on key sections of the ER.

SUMMARY OF ISSUES

SEA conclusions

- **We agree with the SEA's conclusion that there are no overriding environmental considerations that would preclude the UK Offshore Energy Plan from being adopted, given adequate avoidance and mitigation of potentially significant effects.**
- **However, significant displacement, barrier and collision effects on birds cannot be ruled out in the absence of a strategic-level Cumulative Impact Assessment (CIA) of the offshore wind element of the plan.** The assessment of Alternative 3, the preferred alternative, concludes that there are potential negative effects due to barrier effects and changes in food availability, and potential minor negative impacts upon birds due to collision and behavioural changes. However, the overall conclusion is that these effects are not significant at a strategic level. We believe that some of these potential negative/minor negative effects are as likely to be significant at the biogeographical scale as they are likely to be insignificant and as such, we cannot make a definitive determination either way.
- **We agree that existing oil spill controls are adequate and additional controls are not necessary at the strategic level.**

Spatial considerations

- **The proposed 12nm non-exclusionary buffer zone:** We welcome recognition of generally greater sensitivity within 12nm from an ecological, fisheries and navigation and landscape point of view, but also the flexibility for consideration of developments within this area on a case-by-case basis.
- **The proposed 6nm exclusion zone around oil and gas infrastructure seems excessive** in our view and may also put additional pressure on current and proposed Marine Protected Areas. We realise that this generic buffer is linked to helicopter safety and do not wish to unnecessarily promote unsafe conditions, but consider that the 6nm buffer, like the 12nm buffer, should be a 'soft' constraint that can be negotiated on a case-by-case basis.

Appropriate assessment

- **Appropriate Assessment of licensing/leasing proposals:** The RSPB is extremely concerned that no Appropriate Assessment of the Draft Plan has been carried out to date, despite our advice that this would be required. We are of the opinion that the proposals will have a likely significant effect on Special Protection Areas and their bird populations, and that a strategic AA, based largely on the data compiled for the SEA is possible. Therefore, in the absence of a strategic AA, the RSPB finds it difficult to see how DECC can proceed to leasing and licensing decisions and comply with the legal requirements of the Habitats Directive.

SEA approach

The assessment is not robust. In our response to the UK Offshore Energy Plan SEA scoping report in January 2008, we emphasized the need *"for the assessment to consider a wider range of reasonable alternatives for each activity, [and] focus on evaluating cumulative effects..."* While the ER successfully collates large amount of data, it fails to i) assess a wide range of spatial alternatives for each activity, ii) undertake a satisfactory assessment of likely cumulative effects, particularly for birds, and iii) adopt a rationale for judging the significance of effects. Moreover, the recommended avoidance and mitigation measures are inadequate to address potentially significant effects, particularly for birds.

- **The alternatives considered minimalist, non-spatial and fail to address each activity separately.** We are seriously concerned that the alternatives considered in the ER are minimalist at best and fail to address each activity separately (i.e. offshore wind, oil and gas, and gas storage). We are also concerned that the SEA does not consider spatial alternatives to licensing and leasing using the Round 3 Crown Estate map of proposed development zones as one alternative amongst many.
- **The assessment of potential cumulative effects on birds is inadequate:** The claim made in section 5.5.4 that there are unlikely to be cumulative effects on biogeographical populations is not supported by a robust assessment. This effect cannot be ruled out for specific species depending on the scale of multiple wind farms and other developments affecting species across occupied sea areas, including transboundary effects. We note that most of the RSPB's objections to Offshore Wind Farm proposals have related to the cumulative effects of multiple wind farms on the relevant SPA population (e.g. Sheringham Shoal), rather than relating to population level impacts of individual wind farms. Adequately addressing cumulative effects is key to minimizing any potential adverse environmental impacts of offshore wind farms.
- **The methodology for determining significance of effects is unclear.** The ER does not define the significance criteria used to assess the likely environmental effects of the Draft Plan. For example, it is unclear how a minor negative effect is distinguished from a major negative effect and how their relative significance is decided. More detailed significance criteria should have been developed, taking into account the SEA Directive's requirements in Annex 1.
- **In our view, negative transboundary effects on birds cannot be ruled out.** This is because i) bird populations are transboundary, and ii) the Round 3 zone extends to the edge of UKCS, e.g. Dogger Bank, therefore potentially abutting other Member State offshore wind farms and oil and gas proposals as well as existing infrastructure and the effects of fishing activities.
- **Existing arrangements are inadequate to monitor the likely environmental effects of the Draft Plan.** The ER finds that existing monitoring arrangements are sufficient to understand the evolution of baseline conditions in respect of biodiversity effects across the SEA area. However, we disagree as most Food and Environment Protection Act (FEPA) monitoring requirements are compliance monitoring and not necessarily helpful in advancing our knowledge of effects/impacts on birds.
- **We welcome the receptor-based assessment, the adoption on many fronts of the precautionary approach and the incorporation of SEA Steering Group and COWRIE contributions.**

SEA Recommendations

- **Recommendation 6 (Marine Protected Areas):** Recommendation 6 needs to make it explicit that in some cases, Natura 2000 sites (and other MPAs) may not be leased at all. As currently drafted, this recommendation seems to indicate that environmental objectives are secondary to economic ones.
- **Recommendation 14 (Marine Protected Areas):** This recommendation runs counter to some other recommendations and is inconsistent with the precautionary approach and should be rephrased to state: "*Where offshore wind developments do not impact on the conservation objectives of MCZs, wind farms may be located in such areas...*" While offshore wind farms and Marine Conservation Zone objectives can be compatible, they cannot be defined as 'coincident'.

- **Recommendation 19 (expansion of Round 1 and Round 2 sites):** We agree that Round 1 sites should not be expanded and note that seaward expansion of Round 2 sites, while preferable to landward expansion, may cause adverse cumulative effects on some bird populations. Therefore, Round 2 expansions should be considered on a case-by-case basis.
- **Recommendation 21 (offshore database):** We strongly support this recommendation and urge the Crown Estate to tie in data deposition requirements within offshore wind farm consents. There needs to be a long-term resolution of how this database is used and managed (currently there is a backlog of data and the database is not used effectively).

Ornithological data needs

- **Additional surveys are essential to cover all those SEA areas that may attract interest from offshore wind developers (within suitable depth parameters), and that have not already been covered in Rounds 1, 2 and 3 surveys.** There is a need to continue surveys beyond this year and to review priority areas. The programme put forward for 2007 / 08 should be extended to provide data over a minimum of two to three years before planning applications are submitted in order to address gaps in knowledge about the distribution and abundance of birds at sea
- **In order to utilise the same survey platform before and after construction, a solution must be found to the problem of low flying in post-construction wind farms.**
- **Additional boat surveys are necessary to enable simultaneous collection of behavioural observations and environmental variables.** These types of boatsurveys are more suitable for identifying some species of seabirds, and therefore should be integrated into data collection programmes.
- **In terms of practical survey work, it will be necessary to strike an appropriate balance between expedient coverage of large survey areas, and adequate coverage to enable robust density estimations.** Transect separation will be the means to address this potential conflict, but caution is needed in increasing transect separation too much and thereby missing concentrations – a potential problem especially for species with clumped distributions.
- **There is scope for expanding current tracking studies (mainly using GPS loggers) to other species and other colonies with funding input from government and industry to assist with information provision for R3.**
- **A GIS atlas of bird distribution and abundance would be an extremely useful component of a constraints assessment for offshore energy, whilst also enabling information gaps to be identified.** If such an atlas is to be relevant to R3, it needs to be progressed as soon as possible.
- **It is recommended that a minimum of two years data collection precede a planning application, but that data collection should continue during the pre-construction period.**

RSPB'S RECOMMENDATIONS

1. **Undertake Appropriate Assessment of the Draft Plan:** In our view, the Draft Plan is likely to have significant effects, and may potentially have adverse effects on coastal and offshore Natura 2000 sites, and therefore will require a strategic-level Appropriate Assessment. The SEA Environmental Report contains most of the data necessary for a strategic-level AA.
2. **Undertake a strategic-level Cumulative Impact Assessment:** A strategic level Cumulative Impact Assessment (CIA) should be undertaken, ideally led by DECC, as CIA at the project level is unlikely to adequately predict likely cumulative effects. This CIA could underpin the assessment of in-combination and cumulative effects for the Appropriate Assessment of the Draft Plan. Note that a strategic CIA does not need to be entirely quantitative and can be based on a straightforward evaluation of whether additive effects are likely or not. For example, the SEA could have predicted, without the use of Populations Viability Analysis, that cumulative effects on gannet near Dogger Bank may be significant depending on levels of activity. We believe that it is possible to carry out a strategic CIA now, e.g. of the Crown Estate potential development zones for Round 3, together with Scottish Territorial Water proposals, using a combination of quantitative and qualitative methods. We would be happy to discuss this point in more detail.
3. **Publish a research plan for collecting environmental data in the marine environment:** This research plan should address the data needs outlines in the RSPB Round 3 offshore wind farm report (Annex 1). We would be happy to discuss these points further.
4. **Coordination and effective long-term use of the offshore environmental database:** There needs to be a long-term resolution of how the offshore database is used and managed. We strongly support Recommendation 21 and recommend that the Crown Estate tie in data deposition requirements within offshore wind farm consents. We note that data collected for Offshore Wind Farms and marine SPA designation should be integrated to i) progress the designation of marine Special Protection Areas (SPAs) and ii) to provide baseline information to determine suitability of proposed development zones for Round 3 offshore wind.
5. **The current Scottish Territorial Waters SEA should adopt an appropriate buffer zone based on environmental rationale:** We recommend that the ongoing SEA for Scottish Territorial Waters (STW) adopt an appropriate buffer zone for STW based on environmental rationale.
6. **The current Northern Ireland offshore and marine renewables SEA should provide a starting point for the future planning of marine renewable energy projects in NI.** The forthcoming NI Marine Bill and system of marine spatial planning will play a valuable role in providing a joined-up process by which conflicts between present and future offshore energy developments are resolved. In the meantime, the NI offshore wind and marine renewables SEA process should be used to integrate environmental issues into the formulation of marine renewable energy policy.
7. **Develop guidance for EIAs for offshore wind farms, oil and gas and gas storage:** In our view, additional guidance is needed on the above.
8. **Pre-application data collection:** We recommend a minimum of two years data collection preceding a planning application plus ongoing annual pre-construction data-collection (Langston 2008, C. Barton pers. comm.)
9. **In our view, existing arrangements are inadequate to monitor the potential effects of the Draft Plan.** The inadequacies of monitoring arrangements should be addressed

through incorporating detailed monitoring and reporting requirements into leases and licenses.

10. **Future SEAs in the marine environment should carry out fresh assessments of new proposals:** DECC proposes to update this SEA on a rolling basis. As long as this is carried out with due process, includes any new information or data and the potential environmental effects of future plans are freshly assessed, we support this proposal.

DETAILED COMMENTS ON THE ENVIRONMENTAL REPORT

2.1 Overview of the Draft Plan & relationship to other initiatives

We acknowledge that the UK Offshore Energy Plan is a high level plan. However, in our response to the scoping report in January 2008 we highlighted the importance of adding further detail to the Draft Plan as it covers licensing for three very different activities. In particular, though we recognise that predictions of oil and gas activity are best estimates made on current knowledge and understanding, we suggested that the assessment would be improved if it were able to predict the likely impacts should activity be half or double that predicted. The draft plan as described in section 2.1 does not include predictions of oil and gas activity, and consequently the assessment falls short of adequately assessing the likely effects of such activity.

2.2 Further spatial considerations - Marine Protected Areas (MPAs)

There are likely to be conflicts between energy licensing applications (oil and gas, offshore wind, CCS), and the, as yet incomplete, Natura 2000 network and forthcoming Marine Conservation Zones (including highly protected MCZs) network. The RSPB is extremely concerned that no Appropriate Assessment of the licensing/leasing proposals has been carried out to date, despite our advice that this would be required. The RSPB is of the opinion that the proposals will have a likely significant effect on Special Protection Areas and their bird populations, and that a strategic AA based on the data compiled for the SEA is possible. Therefore, in the absence of a strategic AA, the RSPB finds it difficult to see how DECC can proceed to leasing and licensing decisions and comply with the legal requirements of the Habitats Directive. In addition, any locations known to incorporate nationally important features should be treated as if they were designated MCZs until the network has been completed.

3. SEA approach

We welcome the receptor-based assessment, the adoption on many fronts of the precautionary approach and the incorporation of SEA Steering Group and COWRIE contributions.

However, while this SEA successfully collates vast amounts of environmental and socio-economic information, it falls short of rigorously assessing the Draft Plan's effects on the environment.

In our response to the UK Offshore Energy Plan SEA scoping report in January 2008, we emphasized the need "for the assessment to consider a wider range of reasonable alternatives for each activity, [and] focus on evaluating cumulative effects..." However, this SEA fails to consider a wide range of alternatives for each activity (section 5.16), nor has it undertaken a satisfactory assessment of likely cumulative effects (sections 5.5.4 & 5.14), particularly for birds. The rationale for determining the significance of effects is also unclear because it is not adequately defined. These points are discussed in more detail below.

4. Environmental information

Despite data collation and collection through previous SEAs 1-7, there are still significant information gaps, especially for seabirds at sea, that will necessitate new data collection. To some extent, this has been recognised, with some additional aerial and, for the purpose of the SEA, boat-based bird surveys. A project involving satellite tracking of whooper swans on migration between the UK and Iceland is underway, funded through COWRIE.

We fully agree with the recommendation in this section to integrate data collected for various purposes, notably for Offshore Wind Farms (OWFs) and marine SPA designation, which is necessary to progress the designation of marine Special Protection Areas (SPAs) and to

provide baseline information to determine suitability of proposed development zones for R3 offshore wind.

4.2 Overview of environmental baseline

i) Additional aerial and boat bird surveys

Additional surveys are essential to cover all those SEA areas that may attract interest from offshore wind developers (within suitable depth parameters), and that have not already been covered in Rounds 1, 2 and 3 surveys. There is a need to continue surveys beyond this year and to review priority areas. Survey areas need to provide contextual information as well as information specifically for the proposal area. Many of the proposed Crown Estate (CE) zones are of sufficient size to encompass both potential wind farms plus a wider contextual area. However, some of the zones in the English Channel in particular are relatively small and will therefore require larger areas surveyed to enable the information for the zone to be placed in a wider context, i.e. is the zone typical or does it contain higher or lower densities of a particular bird species.

The programme put forward for 2007 / 08 should be extended to provide data over two to three years before planning applications are submitted in order to address gaps in knowledge about the distribution and abundance of birds at sea (updating the European Seabirds at Sea (ESAS) database and providing data at a finer resolution more suited to the requirements of offshore wind energy). Recent analysis by the BTO for COWRIE¹ has highlighted that several years of baseline data are necessary in order to detect any post-construction effects on birds. Therefore, as discussed at a recent meeting of the Scottish Renewables Forum, it is recommended that a minimum of two years data collection precede a planning application (Langston 2008, C. Barton pers. comm.), but that data collection should continue in order to provide up to five years pre-construction data.

Just as with earlier rounds of offshore wind farms, aerial surveys enable more rapid coverage of large areas and are generally considered better at detecting species susceptible to disturbance (notably divers and seaducks). However, some of the large concentrations of divers in the Thames were observed from boats and, in the case of the large offshore zones relevant to R3, both approaches have their limitations in terms of coverage because of the longer distance offshore before reaching survey areas. In particular, in order to utilise the same survey platform before and after construction, a solution must be found to the problem of low flying in post-construction wind farms.

Currently, COWRIE and some industry members are assessing the suitability of HiDef video survey from higher elevations as compared to conventional aerial survey techniques in order to determine whether the HiDef approach will deliver high quality results. This problem of low flying in post-construction wind farms has presented an unforeseen problem and one not faced by the Danes, who used extensive boat surveys. Boat surveys enable simultaneous collection of behavioural observations and environmental variables, are more suitable for identifying some species of seabirds, and therefore should be integrated into data collection programmes.

ii) Achieving both expedient and adequate coverage of large survey areas

The critical issue in terms of practical survey will be striking an appropriate balance between expedient coverage of large survey areas, with adequate coverage to enable robust density estimations. Transect separation will be the means to address this potential conflict, but caution is needed in increasing transect separation too much and thereby missing concentrations – a potential problem especially for species with clumped distributions. This

¹ Maclean IMD & Rehfishch MM (2008). Developing Guidelines for Ornithological Cumulative Impact Assessment: Draft Discussion Document. British Trust for Ornithology Research Report No. 513 for COWRIE, 41pp. BTO, Thetford.

will to some extent be overcome by adopting transects across environmental gradients and by collecting data for wind farm proposal areas at a finer resolution than for coverage of the whole zone, e.g. 4km separation across the zone and 2km between transects across proposal sites. We note that the ESAS survey snapshots for the SEA were conducted at 5km separation (C. Barton pers. comm.)

iii) Tracking studies

The use of satellite tags to obtain positional information about several species during their migration to/from the UK and to identify foraging areas at sea by birds from onshore breeding colonies (notably SPAs) is underway. For example, there is a study underway to follow whooper swans during their migration between Iceland and the UK (e.g. Pennycuik et al. 1996², Pennycuik 1999³), as species of concern relating to the possible cumulative effects of the proposed Walney and West of Duddon Sands offshore wind farms in the Round 2 area of SEA 6. A similar study on pink footed geese has been proposed, but so far not progressed any further.

There are several tracking studies (mainly using GPS loggers) on several seabird species associated with several breeding colonies. There is scope, as recommended in Langston 2008⁴, for expansion of these studies to other species and other colonies with funding input from government and industry to assist with information provision for R3. Most work to date, mainly by academic research institutions, with involvement of CEH, RSPB, JNCC and some other organisations, has been to identify foraging areas associated with specific SPAs.

Additionally, there have been radio tracking studies of terns in relation to several R2 offshore wind farm proposals (Perrow et al 2006)⁵.

iv) Radar tracking of bird migration

Whilst generally of limited potential for identifying bird species responsible for the tracks observed on radar, nonetheless, military radar has been used in the past to determine migration volume across the North Sea (e.g. Lack 1959⁶, 1960⁷, 1963⁸).

v) GIS atlas of bird distribution

A GIS atlas of bird distribution and abundance, pulling together all available information, would be an extremely useful component of a constraints assessment for offshore energy, whilst also enabling information gaps to be identified (thereby updating the DTI gaps analysis by Pollock & Barton 2006⁹). Inclusion of down-weighted ESAS data where older than 10 years would be advisable. A proposal for this work was prioritised for progression by DECC RAG, but unfortunately stalled when it is was becoming most relevant to produce a

² Pennycuik, C. J., Einarsson, O., Bradbury, T. A. M. & Owen, M. 1996. Migrating Whooper Swans *Cygnus Cygnus*: Satellite Tracks and Flight Performance Calculations. *J. Avian Biol.* 27: 118-134

³ Pennycuik, C. J., Bradbury, T. A. M., Einarsson, O. & Owen, M. 1999. Response to weather and light conditions of migrating Whooper Swans *Cygnus Cygnus* and flying height profiles, observed with the Argos satellite system. *Ibis* 141: 434-443

⁴ Langston 2009. Round 3 offshore wind farm developments and birds at sea. April 2009 reissue of formerly confidential RSPB report November 2008. RSPB, Sandy.

⁵ Perrow M. R. Skeate E. R., Lines P., Brown D. and Tomlinson M. L. 2006. Radio telemetry as a tool for assessing impacts of windfarms: the case of Little Terns *Sterna albifrons* at Scroby Sands, Norfolk, UK. *Ibis* 148:57-75.

⁶ Lack, D. 1959. Migration across the North Sea studied by radar: 1. Survey through the year. *Ibis* 101: 209-234

⁷ Lack, D. 1960. Migration across the North Sea studied by radar: 2. The spring departure 1956-59. *Ibis* 102: 26-57

⁸ Lack, D. 1963. Migration across the southern North Sea studied by radar: 4. Autumn. *Ibis* 105(1): 1-54

⁹ Pollock, C. & Barton, C. 2006. An analysis of ESAS seabird surveys in UK waters to highlight gaps in coverage. Report to the DTI by Cork Ecology.

GIS atlas of bird distribution. If such an atlas is to be relevant to R3, it needs to be progressed as soon as possible.

4.2.1 UK Context – Biodiversity, habitats, flora and fauna

With respect to the description of bird fauna on p.40, there are additionally birds that occur on passage, during their migrations between more northerly breeding areas and southerly wintering areas, when they stopover in the UK (applies also to p.vii).

In addition, in the description of Regional Sea 2 & 3 (p.45-46) there is no mention of migratory waterbirds.

4.3 Relevant existing environmental problems

Table 4.1 on environmental problems relevant to offshore oil and gas licensing and wind should also note under the 'Fishing and changes to fishing communities' heading on p.52 that there are various bird species also susceptible to fishing bycatch, although totals in UK waters are unknown.

The 'Vulnerability of seabirds, coastal waterbirds etc' heading on p.52 should include that SPAs also include birds on passage (Stroud et al. 2001)¹⁰ and coastal colonies also provide safe areas for moulting.

4.4 Likely evolution of the baseline

The inferences for waterbirds in this section are not borne out by Austin et al. 2008, with the notable exception of ringed plover which continues to decline. Note that ringed plover and turnstone are both species whose declining population trends (until recent years for turnstone) were attributed as being indicative of short-stopping due to climate change. Dark-bellied Brent geese have shown a strong increase in recent years following declines during the 1990s. Shelduck is showing a pattern of decline from a stable level held for quite a few years; this merits keeping a close watch to determine whether this trend continues. Bar-tailed godwit is a species of international importance at several UK sites that is showing a steady decline of considerable concern

5. Assessment & significance of effects

i) Overall conclusions

The SEA Environmental Report concludes that a further round (R3) of offshore wind development should proceed within a spatially restricted area. The only spatial restriction proposed is the recommendation for limited development with 22km of the coast. We agree with the conclusion that there are no overriding environmental considerations that would preclude the UK Offshore Energy Plan from being adopted, given adequate avoidance and mitigation of potentially significant effects.

With respect to birds, the assessment concludes that the Draft Plan's "...displacement, barrier effects and collisions are unlikely to be significant to birds at a population level." (p.127). The ER does acknowledge that there are important uncertainties in relation to bird distribution (and temporal variability) as well as the sensitivity of this conclusion to modelling assumptions (notably avoidance frequency in modelling collision risk; and several important factors in modelling of population dynamics). In our view, the above conclusion does not adequately reflect the likely significance of the Draft Plan's effects on birds at a population level. While significant displacement, barrier and collision effects **might be unlikely**, significant effects cannot be ruled out in the absence of a strategic-level Cumulative Impact Assessment (CIA) of the offshore wind element of the Draft Plan.

¹⁰ Stroud, D. A., Chambers, D., Cook, S., Buxton, N., Fraser, B., Clement, P., Lewis, P., McLean, I., Baker, H. & Whitehead, S. 2001. *The UK SPA network: its scope and content*. JNCC, Peterborough.

ii) Significance of effects

While some rationale for determining significance is cited in certain sections of the ER, the report does not adequately define the criteria used to determine significance during the assessment. For example, it is unclear how a minor negative effect is distinguished from a major negative effect. More detailed significance criteria should have been developed, taking into account the SEA Directive's requirements in Annex 1 to include secondary, cumulative, synergistic, short, medium and long-term, permanent and temporary, positive and negative effects, and that assessments take account of magnitude, sensitivity of the receiving environment, and whether they likely to be reversible or irreversible, probable or improbable, frequent or rare. See p.42 of the [Wales Rural Development Plan SEA](#) for an example of generic significance criteria.

5.1 Assessment approach and methodology

At a strategic level, a distinction has been drawn between impacts which may be significant in terms of conservation status of a species or population (and hence are significant in strategic terms), and impacts which may be significant to individual animals, but which will not influence sufficient numbers to have a significant effect on population viability or conservation status (and hence strategically significant).

There are two levels of assessment necessary. There is a legal requirement to determine the risk of an adverse effect on an SPA. There is also a need to assess the effect on the relevant biogeographical population, which may or may not be likely for an individual project, but necessitates cumulative impact assessment.

5.3.2.4 Other receptors

Page 76 states that:

“Direct effects on seabirds because of seismic exploration noise could occur through physical damage, or through disturbance of normal behaviour. Diving seabirds (e.g. auks) may be most at risk of physical damage. The physical vulnerability of seabirds to sound pressure is unknown, although McCauley (1994) inferred from vocalisation ranges that the threshold of perception for low frequency seismic in little penguins would be high, hence only at short ranges would penguins be adversely affected. Mortality of seabirds has not been observed during extensive seismic operations in the North Sea and elsewhere. A study has investigated seabird abundance in Hudson Strait (Atlantic seaboard of Canada) during seismic surveys over three years (Stemp 1985). Comparing periods of shooting and non-shooting, no significant difference was observed in abundance of fulmar, kittiwake and thickbilled murre (Brünnich's guillemot). It is therefore considered unlikely that offshore seismic noise will result in significant injury or behavioural disturbance to seabirds.” (p.76)

This section makes an assumption that it is visual, rather than noise, cues that lead to a disturbance response, which may not be correct in all cases. Separation of noise and visual stimuli in disturbance response by birds is often not possible.

5.5 Physical presence – ecological implications

This section states that:

“Furthermore, some receptors (birds and marine mammals) are the focus of considerable attention from a range of NGO and conservation organisations with occasional lack of distinction between conservation, welfare and ethical concerns. This assessment aims to draw balanced conclusions based on credible scientific evidence, while recognising that some precautionary concerns are valid given current uncertainties and information gaps.” (p.108)

This criticism stems from the perceived NGO opposition to any additive increase in mortality, however small. However, there is often considerable uncertainty around estimates, which may differ by orders of magnitude, leading to accountable significance levels ranging from

major to negligible. If there is not reasonable confidence in the figures presented, conservation organizations are obliged to take the precautionary approach where potential receptors are notified or qualifying interest features. The reference population is critical to determining level of effect and the SEA confuses the need to assess both;

- a) potentially biologically significant effects at the scale of the relevant biogeographical population; and
- b) the legal requirement to maintain favourable conservation status at the level of individual or multiple SPAs or qualifying sites.

5.5.2.1 Displacement and barrier effects

The Shell Flat case study on p.138 highlights several points:

- a) the risks associated with proposing OWFs in areas of particular nature conservation importance, in this case particularly high densities of common scoter, at a time when knowledge of impacts was scarce and inadequate to avoid applying the precautionary principle;
- b) there were protracted negotiations to find a satisfactory resolution to Shell Flat;
- c) the authors imply that environmentalists unnecessarily impeded progress of this development proposal, when there were other constraints also squeezing the location of options; and
- d) the essential requirement for research and monitoring at consented sites to improve knowledge.

Recent Danish studies have provided some insights to common scoter behavioural response to OWF, but even these robust studies missed the opportunity to obtain longer-term information to enable a distinction to be made between short-term and longer-term effects and so resolve the uncertainty relating to displacement effects on common scoter and red-throated diver.

Subsequent surveys indicate that common scoters may now be distributed in comparable densities inside and outside the development; and the possibility cannot be excluded that changes in food availability rather than displacement by disturbance led to the observed changes in distribution (Petersen *et al.* 2007)¹¹. It is also possible that these changes reflect habituation to wind farm presence and associated activities.

We note that the DECC RAG study at Aberdeen University investigating aspects of energetic costs of potential barrier effects is absent from the list of case studies in this section. We would appreciate clarification as to why, and assume that it is because the study is not yet available.

5.5.2.2 Bird collision risk

In Table 5.3 it should be made clear that (presumably) the interpretations are those presented in the respective ESs from which the information is drawn, i.e. “worst case scenario”, “precautionary collision avoidance”, “SNH Collision Risk Model (CRM) assumes no avoidance” etc.

The SNH collision risk model at stage one does assume no avoidance, but the guidance for applying the model does not assume that there is no avoidance behaviour. The point of contention is the appropriate avoidance rate to use for most species; there are very few for which a robust and comprehensive avoidance rate is available. Avoidance is the key factor in

¹¹ Petersen, I.K., Clausager, I. & Fox, A. D. 2007. *Changes in bird habitat utilisation around the Horns Rev 1 offshore wind farm, with particular emphasis on Common Scoter*. Report to Vattenfall A S by NERI, University of Aarhus, Denmark.

the CRM that has a large impact on the model outputs for just a small change in avoidance rate. Avoidance is not only likely to be highly species specific, but also variable seasonally and for different age/status of birds within species. Only through thorough post-construction monitoring at consented wind farms, will this situation be improved.

The main conclusions which can be reached from Table 5.3 are that;

- a) numerical predictions are highly sensitive to assumptions on avoidance rates; and
- b) excluding scenarios with zero avoidance, the maximum predicted collision rates for any species are of the order of a few tens (per year, per development).

Most of the RSPB's objections to OWF proposals have related to cumulative effects of multiple wind farms and impacts on the relevant SPA population (e.g. Sheringham Shoal), rather than implying biogeographical population level impacts. In the case of Walney, our concern related primarily to migratory waterbirds, notably whooper swans which do not appear in the Table 5.3 and for which the question raised was whether data were adequate to assess volume of movement through the wind farm. This prompted a COWRIE study now underway to determine collision risk for swans on migration between the UK and Iceland. We note that not all OWF are included in this table, e.g. London Array.

Additional references relevant to, but not quoted in, this section include Drewitt & Langston (2008, *Annals of the New York Academy of Science*)¹².

5.5.3 Spatial considerations - the proposed 12nm buffer zone

The conclusion of the spatial mapping exercise is that the generation target of 25GW (additional to Round 1 & 2 capacity) can be achieved, even with the implementation of a 12nm buffer zone around our coasts. The major potential receptors identified are birds (5.5.3, p.118). Therefore, the ER acknowledges that potential effects are likely to be related to bird distribution and the relative sensitivities of species.

i) Table 5.4 - Species-specific Sensitivity Index and other information pointing to focal species in relation to proposed wind farms.

The Garthe & Hüppop (2004) sensitivity index would require extension to a wider range of species and to be updated from a UK perspective. We welcome the acknowledgment on p.119 that the scores in Table 5.4 represent an initial assessment that is not suitable for updated baseline data collection.

The Offshore Vulnerability Index (OVI) depends on ESAS data and therefore suffers from all the problems associated with over-reliance on ESAS data. It is currently the best data available for many offshore areas but is recognized to be of limited value owing to age of data (most >20yrs), coarse spatial resolution and gaps in data (DTI "Gaps Analysis" Cork Ecology); see the critique in Langston 2008. At the very least, there needs to be sample resurvey to determine the suitability of continuing to depend on ESAS data in terms of how relevant it is to today's distributions and abundance.

ii) Table 5.5 showing priority risks in relation to Round 3 wind leasing

We largely agree with Table 5.5 showing priority risks in relation to Round 3 wind leasing, which is largely based on Langston 2008 and converted to regional seas (p.123). It would be advisable to include a caveat here relating to future findings of baseline surveys. However, we agree that this table reflects current knowledge based on existing data.

iii) The 12nm / 22km proposed buffer zone

¹² Drewitt, A. L. & Langston, R. H. W. 2008. Collision effects of wind-power generators and other obstacles on birds. *Annals of the New York Academy of Sciences* 1134: 233-266.

Because of the sensitivity of multiple receptors, and the complexity of decisions regarding major infrastructure near the coast, the SEA concludes that the 25GW should be sited well away from the coast and recommends a 22km or 12nm buffer zone in which proposed wind farms of 100MW or more would not normally be permitted. The recommended R3 buffer is not exclusionary and we note that Crown Estates recently granted 10 exploration licences for offshore wind within Scottish Territorial waters, i.e. within 12nm. These licenses are all for big developments between 280-1500MW. The only areas recommended as an exclusion zone for oil and gas, is the area 14 degrees west of the Hebrides (a recommendation made in SEA7).

In our response to the SEA scoping report in January 2008 we expected the existing exclusion buffer zones of 8-13km set up during Round 2 to be retained for future offshore wind leasing rounds, unless further general or site specific survey or research showed that it was not necessary. The Round 2 SEA recommended a coastal buffer zone based on the ecological rationale of protecting sensitive habitats and species, e.g. to ensure that feeding seabirds were adequately protected, as well as to reduce impacts on seascape from the coast. Developments in Round 2 were permitted at a minimum distance offshore of 8km, increasing to 13km in areas of particular sensitivity such as those in close proximity to Areas of Outstanding Natural Beauty (AONBs) and areas where the seabed was less than 20m below the sea surface, in order to incorporate common scoter in the Irish Sea. Specifically in the North West strategic area, Liverpool Bay, developments were also restricted to water depths greater than 10 m to reduce the potential for overlap with common scoter concentrations.

The R3 22km buffer zone reflects the great sensitivities of inshore waters, not only for ecological receptors but for all interests including fisheries, navigation and other users, and highlights to developers the additional risk/likelihood of conflict in coastal waters. We welcome the flexibility of this non-exclusionary buffer zone.

iv) The 6nm exclusion zone around oil and gas infrastructure

We realise that this generic buffer is linked to helicopter safety and do not wish to unnecessarily promote unsafe conditions, but understand that the buffer can be negotiated on a case-by-case basis. Therefore, a *de facto* 6nm exclusion zone seems excessive in our view and may also put additional pressure on current and proposed MPAs (Table 5.17).

v) Scottish territorial waters and offshore SEA

A similar 22km buffer zone will not be workable for Scottish territorial waters as it would automatically exclude the vast majority of potential offshore wind farm sites. We recommend that the ongoing SEA for Scottish Territorial Waters (STW) adopts an appropriate buffer zone based on environmental rationale.

As noted above, that Crown Estates recently granted 10 exploration licences for offshore wind within Scottish Territorial waters, i.e. within 12nm. It seems these exploration licensed areas are all >20m deep and unlikely to hold many, or regular, seaducks/divers. However, some are known to be important seabird feeding areas, e.g. Wee Bankie, off the Firth of Forth. All areas have so far been poorly surveyed.

iv) Northern Ireland offshore wind and marine renewables SEA

We note that there is an ongoing SEA of offshore wind and marine renewables in Northern Ireland (NI) waters. The SEA coverage will extend out from baselines to 12 nautical miles and will focus on several sites, including the north coast. It is expected to be completed in early 2010, including the public consultation phases. We recommend that this SEA also adopt a buffer zone based on environmental rationale.

Given that this SEA is Northern Ireland's first offshore SEA, we hope that the process will reflect SEA good practice (see Box 1 below).

The forthcoming NI Marine Bill and system of marine spatial planning will play a valuable role in providing a joined-up process by which conflicts between present and future offshore energy developments could be resolved. In the meantime, the NI offshore wind and marine renewables SEA process should be used to integrate environmental issues into the formulation of marine renewable energy policy. This SEA should provide a starting point for the future planning of marine renewable energy projects in Northern Ireland.

Box 1: Selected SEA good practice points (SEA: Learning from Practice, RSPB, 2007¹)

- In line with the aims of the SEA Directive, ensure the assessment process gives a high level of protection to the environment and contributes to sustainable development. SEA should result in a more environmentally-sustainable plan.
- Review progress towards this goal at each stage. Consult with interested parties during the scoping stage of SEA. This helps build consensus on relevant environmental problems.
- Involve professionals with relevant expertise to help ensure issues are properly assessed.
- Establish an SEA steering group, consisting of a range of interest groups including the RSPB. Steering groups provide valuable, and cost-effective advice, on all aspects of the SEA, including its scope, assessment methods and the need for additional studies, such as the potential collision risk to birds.
- Evaluate the proposed alternatives. If no alternatives are presented by the plan makers, several should be developed and evaluated as part of SEA. These should include the 'most environmentally beneficial' alternatives. Ensure the level of detail and the assessment methodologies are appropriate to the nature and scale of the plan.
- Robustly assess potential cumulative effects.
- Use the 'Positive Planning' approach to safeguard biodiversity and other environmental assets. This means proposing methods to reduce likely adverse impacts at source, then mitigating impacts that cannot be reduced further, and finally compensating for residual impacts.
- Use the results of higher-tier SEA, such as the UK Offshore Energy Plan SEA, to inform the assessment, and make clear links with lower-tier SEA and/or EIA for resulting projects, as appropriate.

5.5.4, 5.5.4.2 & 5.14 Cumulative impact considerations

i) The ER's assessment of cumulative effects

The SEA identification and evaluation of the potential cumulative effects of multiple offshore licenses is unsatisfactory, particularly with respect to birds. The claim made in section 5.5.4 that there are unlikely to be cumulative effects on biogeographical populations is not supported by a robust assessment. This effect cannot be ruled out for specific species depending on the scale of multiple wind farms and other developments affecting species across occupied sea areas, including transboundary effects.

This section highlights the use of PVA in assessing cumulative impacts without adequate emphasis on the logistical problems of obtaining the necessary information for some of the key species. Although PVA is the ideal tool to assess cumulative effects, without the basic

modelling requirements, specific to each species, the outputs of such models will be of doubtful veracity.

ii) The need for a strategic-level Cumulative Impact Assessment (CIA)

We recommend that a strategic level Cumulative Impact Assessment (CIA) is undertaken, ideally led by DECC, as project level CIA is unable to adequately predict cumulative effects. This CIA could underpin the assessment of cumulative and in-combination effects for the Appropriate Assessment of the Draft Plan.

A strategic CIA does not need to be entirely quantitative and can be based on a straightforward evaluation of whether additive effects are likely or not. For example, the SEA could have predicted, without the use of PVA, that cumulative effects on certain species near Dogger Bank may be significant depending on levels of activity. Causal chain analysis can be used to quantitatively assess the risks of significant cumulative effects on a series of receptors, e.g. the list of priority bird species in Table 5.5 (please see the RSPB note on causal chain analysis in Annex 3 and 'Guidelines for Cumulative Effects Assessment in SEA of Plans' by L.Cooper¹³ for an overview of CEA methodologies).

We believe that it would be possible to carry out a strategic CIA now, e.g. of the Crown Estate potential development zones for R3, together with Scottish Territorial Water proposals, using a combination of quantitative and qualitative methods. The spatial scale for the CIA should be a set of functional units within the Round 3 strategic zone. These functional units could be based on the division of Regional Seas. However, it is important that the potential for cumulative impacts between zones is also evaluated.

We would be happy to discuss this point in more detail.

ii) Potential cumulative effects of the Draft Plan on birds of particular concern in UK waters

- The sandbanks off the **greater Wash** face a substantial share of the 25GW target put forward in the Draft Plan. In the greater Wash area, cumulative collision and barrier impacts on migrating waterbirds, in particular may be important. Although migration is over a broad front for some species, the concentration of windfarms in the greater Wash is likely to become an increasing issue that needs to be dealt with effectively.
- The **Liverpool Bay and Thames Estuary** proposed SPAs are key considerations, particularly when in combination/ cumulative effects are taken into account. In the Thames, in combination/ cumulative impact risk is likely to preclude any further development within the proposed SPA, at least until further post-construction monitoring data from Round 2 is available, and this is reflected in the absence of any proposed zone in this area.
- Cumulative effects may be important in the **North West**, particularly with respect to migrating whooper swans and pink-footed geese, although the potentially most concerning proposed development zones have been withdrawn, at least for R3.
- **Cumulative effects of concern** are tern (Firth of Forth, including STW proposals), gannet (especially North Sea) collision with rotors, potential displacement of red-throated diver (Norfolk & Suffolk) and shearwaters (in particular in Bristol Channel & Irish Sea, and collision and barrier effects on migratory waterbirds. It is possible that in the future wind farms will be found along a sizeable portion of the migration route of the red-throated diver and cause transboundary cumulative effects.

¹³ <http://www.environment-agency.gov.uk/aboutus/512398/1504325/1504417/831980>.

- Also of concern are the **combined cumulative effects of wind leasing, oil and gas exploration and gas storage** on the marine environment.

iii) Cumulative effects on other receptors

This section concludes that cumulative acoustic effects on other receptors, i.e. not marine mammals, are unlikely. This contradicts other sources of information (e.g. Environmental Statements for Race Bank & Docking Shoal proposals) which suggest there is inadequate information to determine the extent and magnitude of cumulative acoustic effects on spawning and nursery areas for clupeids.

Pile driving effects on fish also include effects on spawning and nursery areas, and effects on piscivorous birds (Section 5.5.4.2).

5.5.5 Summary of findings and recommendations

This section notes that:

“Although there has recently been significant survey in coastal waters, the lack of modern data on waterbirds in offshore areas is noted. Developers need to be aware that access to adequate data on waterbird distribution and abundance is a prerequisite to effective environmental management of activities for example in timing of operations, and oil spill contingency planning. An important gap in understanding of relevance to wind farm siting is the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs. To give a specific example, the East Caithness cliffs SPA holds a seabird assemblage of international importance which during the breeding season regularly supports 300,000 individual seabirds including guillemot, razorbill, kittiwake, herring gull, shag (all at numbers of European importance) as well as puffin, great black-backed gull, cormorant and fulmar. The Smith Bank, some 20km from the cliffs, is generally sandy and recorded as having high densities of sandeels and seabirds; ecological energetics would suggest that the area would be an important feeding ground for auks and several other species from the Caithness cliffs with but definitive evidence of this is not available.” (p.127)

We fully agree with this paragraph. It highlights the need to obtain up to date data and to plug data gaps, notably with respect to identifying foraging areas by breeding (sea)birds and, furthermore, to determine links with onshore SPAs (as well as identifying the marine SPA suite).

5.13 Accidental events

We agree that existing oil spill controls are adequate and additional controls are not necessary at the strategic level (p.188).

5.15 Potential for transboundary impacts

There is a legal requirement to consider transboundary effects through both the SEA and Habitats Directives, e.g. to consider effects on bird populations across multiple SPAs in several MSs.

Our view is that transboundary effects cannot be ruled out given that;

- a) biogeographical populations are transboundary; and
- b) the R3 zone extends to the edge of UKCS, e.g. Dogger Bank, therefore potentially abutting other MS OWF and oil and gas proposals and existing infrastructure.

5.16 Alternatives

The ER recommends that DECC adopt Alternative 3, i.e. spatially restricting the zones offered for licensing through the exclusion of certain areas, rather than Alternatives 1 and 2 (p.123). We welcome this recommendation as Alternative 1 would result in failing to meet renewables targets, and Alternative 2 would have significant negative effects on the environment in the long term

However, so far the SEA process seems to be missing out the second step of the 'Hierarchy of Options' box on p.11; the consideration of alternative modes or processes. We are seriously concerned that the alternatives considered in the ER are minimalist at best and fail to address each activity separately (i.e. offshore wind, oil and gas, and gas storage). We are also concerned that the SEA does not consider spatial alternatives to licensing and leasing using the Round 3 Crown Estate map of proposed development zones as one alternative amongst many.

Table 2.2 (p.12) summarises how the assessment has applied the 'Hierarchy of Options'. In our view, the second and third steps of the hierarchy are not adequately addressed. In particular, the conclusion of step 3 only describes the distribution of wind, oil and gas resources rather than assessing where development should go.

The assessment of Alternative 3, the preferred alternative, concludes that there are potential negative effects due to barrier effects and changes in food availability, and potential minor negative impacts upon birds due to collision and behavioural changes (p.109). However, the overall conclusion is that these effects are not significant at a strategic level. As mentioned above, our view is that the criteria for determining significance are unclear and the data to make such an assessment are not robust. We therefore believe that some of these potential negative/minor negative effects are as likely to be significant at the biogeographical scale as they are likely to be insignificant and as such, we cannot make a definitive determination either way. Therefore, the most we can say is that there is no evidence that there is a significant effect, but equally, there is no evidence to show that there is not a significant effect

6.1 Recommendations

As mentioned above, while the ER has successfully collated vast amounts of environmental baseline information, it has fallen short of adopting a rationale for judging the significance of effects, of assessing spatial alternatives for each activity and of assessing potential cumulative effects. Because of the flawed assessment, the recommended avoidance and mitigation recommendations are inadequate. In Table 1 below, we propose modifications to relevant the recommendations in Section 6.1.

6.2 Monitoring

The ER finds that existing monitoring arrangements are sufficient to understand the evolution of baseline conditions in respect of biodiversity effects across the SEA area. However, this is not our view because effects monitoring is currently limited for OWFs in UK waters. Most FEPA monitoring requirements are compliance monitoring and not necessarily helpful in advancing our knowledge of effects/impacts on birds.

In RSPB responses to individual proposals, we try to influence and improve monitoring provisions in EIA Environmental Statement. However, with exception of monitoring at Kentish Flats, we are unsure as to whether such monitoring has been implemented. We conclude that monitoring arrangements are insufficient and should be addressed through detailed monitoring requirements being incorporated into leases and licenses.

ANNEXES

Annex 1: RSPB Round 3 offshore wind farm report

Annex 2: RSPB note on cumulative effects

Annex 3: RSPB note on causal chain analysis

Table 1: RSPB comments on relevant UK Offshore Energy Plan SEA recommendations (section 6.1)

UK Offshore Energy Plan SEA Recommendation	RSPB comments
<p>3. Until there is a firmer base of information available to inform adaptive management, in respect of ecological receptors a precautionary approach to siting is recommended since the offshore wind industry is relatively young, with appreciable technological development expected in for example, turbine size, rotation speed, spacing and potentially rotational axis. This precautionary approach dictates that unless suitable evidence indicates otherwise, avoidance (for the present) of areas known to be of key importance to waterbird and marine mammal populations, including breeding colonies, foraging areas and other areas essential to the survival of populations.[emphasis added]</p>	<p>We particularly welcome this recommendation.</p>
<p>4. Reflecting the relative sensitivity of multiple receptors in coastal waters, this report recommends that the bulk of this new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km).</p>	<p>This is a useful recommendation which does not preclude development, but highlights a means to reduce the bird species of concern by limiting development within inshore waters. We welcome the flexibility of this non-exclusionary buffer zone which reflects the great sensitivities of inshore waters, not only for ecological receptors but for all interests including fisheries, navigation and other users.</p>
<p>6. For areas (zones and blocks) which contain good examples of habitats/species on the Habitats Directive Annexes, developers should be made aware that a precautionary approach will be taken and some areas with relevant interests may either not be leased/licensed until adequate information is available, or be subject to strict controls on potential activities in the field. Similarly, developers should note that DECC will continue to conduct Appropriate Assessments/screenings to consider the potential of proposed leasing/licensing and subsequent activities to affect site integrity</p>	<p>This recommendation should also note that other potential marine protected areas may not be leased/licensed until adequate information is available or may not be leased at all (also relevant for other MPAs)</p>
<p>8. [partial] Although there has recently been significant survey effort in coastal waters, the lack of modern data on waterbirds in offshore areas is noted. Developers need to be aware that access to adequate data on waterbird distribution and abundance is a prerequisite to effective environmental management of activities for example in timing of operations and oil spill contingency planning</p>	<p>We particularly welcome this recommendation.</p>
<p>9. There remain a number of subject areas for which the information base is limited and will need to be enhanced to support future marine spatial planning as well as project specific consenting. These information gaps include aspects of the natural world and human uses, with regional context and long-term trend data notably lacking. These gaps include:</p> <p>(c) Detail of bird migration patterns, and variability in space and time including flight heights in different weather conditions An understanding of the marine areas routinely used by breeding birds for foraging, in particular those adjacent to SPAs</p>	<p>We agree that these are important information gaps, although point (c) may be difficult to address for some species groups.</p>
<p>11. For the area to the west of the Hebrides (covered in SEA 7) it is recommended that blocks west of 14 degrees west should continue to be withheld from oil and gas licensing for the present. This recommendation also applies to the deepest parts of the Southwest Approaches. This is in view of the paucity of information on many potentially vulnerable components of the marine environment, and other considerations. Once</p>	<p>We welcome this recommendation.</p>

<p>further information becomes available, the possible licensing/leasing in these areas can be revisited.</p>	
<p>14. Efforts are (or will be) underway to identify offshore Marine Conservation Zones/Marine Protected Areas e.g. under the Marine Strategy Framework Directive, OSPAR and the <i>Marine and Coastal Access Bill</i>. Where the objectives of the conservation sites and renewable energy development are coincident, preference should be given to locating wind farms in such areas to reduce the potential spatial conflict with other users.</p>	<p>This recommendation runs counter to some other recommendations and is inconsistent with the precautionary approach. The recommendation should be rephrased to state:</p> <p><i>'Where offshore wind developments do not impact on the conservation objectives of MCZs, wind farms may be located in such areas...'</i></p> <p>While OWF and MCZz objectives can be compatible, they cannot be defined as 'coincident'.</p>
<p>15. Similarly, as part of the Natura 2000 initiative, further offshore SACs and extensions to SPAs are being identified. Such sites are not intended to be strict no-go areas for other activities and a number have been mooted in areas with significant potential for offshore wind farm development. Wind farm developers should be aware that SAC/SPA designation may necessitate, subject to the conclusions of any appropriate assessment, suitable mitigation measures so as to avoid adverse effects on a designated site or species.</p>	<p>The second part of this recommendation should be precise and list the tests of the Habitats Directive.</p>
<p>17. The Offshore Vulnerability Index (OVI) to surface pollutants developed by the JNCC should be reviewed in the light of results from recent aerial and boat based bird survey data, and updated if necessary. Consideration should also be given to whether the development of UK specific individual waterbird species sensitivity indices and mapping of a Wind Farm Sensitivity Index (WSI) in UK waters would be useful in support of appropriate [suggested insertion] site selection and consenting.</p>	<p>The existing initiatives to develop waterbird Population Viability Analysis for sensitive species should be progressed, including, if necessary, research to improve the accuracy of inputs to the models.</p> <p>While there are some issues with these indices, they are a good starting point. In our view, expert judgment will be key in supporting appropriate site selection and consenting. A workshop to discuss and resolve the above issues would be useful.</p>
<p>19. The potential for capacity extensions to existing Round 2 wind farm leases requires careful site specific evaluation since significant new information on sensitivities and uses of these areas is now available (see also recommendation 2 above). As a general rule, it is recommended that any such site extensions are to the seaward rather than the landward side. Round 1 sites are closer to the coast and it is anticipated that the majority would not be extended; any application for this would also require detailed site-specific evaluation.</p>	<p>We agree that R1 sites should not be expanded and note that expansion of R2 sites, while preferable to landward expansion, may cause adverse cumulative effects on some bird populations. R2 expansions should be considered on a case-by-case basis.</p>
<p>21. The information collected by offshore renewables and oil industry site surveys and studies is valuable in increasing the understanding of UK waters. The initiatives such as the UKDEAL, COWRIE and UKBenthos databases to ensure that such information is archived for potential future use should be continued and actively promoted during the consenting processes. Similarly, there should be encouragement for the analysis of this information to a credible standard and its wider dissemination.</p>	<p>We strongly support this recommendation and urge CE to tie in data deposition requirements within OWF consents. There needs to be a long term resolution of how this database is used and managed (currently there is a backlog of data and the database is not used effectively). Updating the database could be carried out alongside a strategic level Cumulative Impact Assessment.</p>
<p>23. To assist developers and the achievement of conservation objectives, DECC and others in Government should encourage the adoption of consistent guidance across the UK on the implementation Habitats Directive requirements, for example disturbance of European Protected Species (Annex IV species).</p>	<p>JNCC have written guidance clarifying a uniform approach for projects.</p>



Round 3 offshore wind farm developments and birds at sea

Rowena Langston
Conservation Science Department

RSPB, The Lodge, Sandy, Bedfordshire SG19 2DL

April 2009

This report was originally released as a confidential report in November 2008, and represents the RSPB's preliminary view of The Crown Estate's potential development zones for offshore wind energy. The report will be updated in the light of the UK Offshore Energy Plan consultation and implementation, together with a wider assessment of priority bird species in UK and territorial waters, later in 2009.

Round 3 offshore wind farm developments and birds at sea

Rowena Langston, Conservation Science

Introduction

In December 2007, the government announced a third round of offshore wind farm development as a key component of delivering 15% of the UK's energy (electricity, heat and transport fuel) from renewable sources by 2020. Strategic Environmental Assessment (SEA) is underway, and due to be published in early 2009. On 4 June 2008, the Crown Estate (CE) first released their suggestions for potential development zones (Appendix I), updated in September 2008 (Figure 1) pre-empting the outcome of the SEA process. CE hopes to accelerate the planning process by pre-qualifying interested developers and sharing the costs – and hence risks - of application, so it will be ready to move forward once the SEA is finalised. However, CE recognises the risk that some zones are likely to drop out as a result of the SEA and will be revising its zones in the light of other information.

This document focuses on seabirds and waterbirds in UK waters, on the basis of coastal breeding colonies and non-breeding coastal and marine distributions. The purpose of this document is to identify those bird species which will be priorities for data collation and collection as part of the Round 3 SEA and subsequent individual project EIAs, especially in the areas mapped by CE as potential development zones (Figure 1), but also in Scottish Territorial Waters. In particular, it will identify species and areas for which risks associated with wind farm development are considered most likely and identify some of the knowledge gaps. This information will help to: inform the RSPB's responses to Round 3 wind farm proposals; encourage a consistent approach in dealing with offshore wind energy casework; provide advice to government, statutory agencies, CE and industry on monitoring and research requirements; and, hopefully, expedite the process by targeting effort where it is needed most.

Policy context

The RSPB believes that climate change is the greatest threat we face and that wildlife is likely to be the earliest victim. For example, science suggests that one third of land based species are threatened with extinction by 2050 unless action is taken to tackle climate change (Thomas *et al.* 2004). In addition, Huntley *et al.* (2007) suggest that;

- The centre of the potential range of the average European breeding bird is predicted to shift nearly 550 km north-east and is only 4/5 the size of the current range.

- For some species, the potential future range does not overlap with the current range at all. The average overlap is 40%.
- Projected changes for some species found only in Europe, or with only small populations elsewhere, suggest that climate change is likely to increase their risk of extinction.

The scientific consensus is that we need to prevent global temperatures rising by more than 2 degrees centigrade above pre-industrial levels and that global greenhouse gas emissions need to halve by 2050 with developed countries taking their fair share and reducing their emissions by 80 - 95% in this period. We continue to campaign for this scale of reduction, as part of the Stop Climate Chaos coalition, and are seeking this in the frameworks provided by climate change legislation across the UK.

Research that we have undertaken (IPPR, WWF & RSPB 2007) suggests that much more effort needs to be invested in reducing the amount of energy we use, in stabilising aviation emissions and decarbonising the electricity sector.

We need a revolution in the energy system which does not rely on the most polluting power stations such as coal fired power stations which do not have the capacity to store greenhouse gas emissions, but rather switches to investing in demand management, energy efficiency and renewable energy generation. This is why the RSPB supports the UK Government's plans to require a tenfold increase in energy from renewable sources (as obliged under the EU target for 20% of Europe's energy needs to come from renewable sources by 2020). Yet, we also want this energy revolution to take place in harmony with the natural environment. This is the core of our response to the Renewable Energy Strategy consultation and the RSPB's Climate Action Now campaign.

Bird distributions and movements in and around UK seas

Seabird breeding colonies

The UK is of outstanding international importance for its breeding seabirds (Figures 1 & 2), notably Manx shearwater, northern gannet, great skua and lesser black-backed gull for which it supports over 50% of their respective biogeographical populations, as relevant to the EU Birds Directive (Reid in Mitchell *et al.* 2004).

Non-breeding distributions of birds at sea

European Seabirds At Sea (ESAS) data are acknowledged to be patchy in their coverage of UK waters, available at a fairly coarse spatial resolution, and now mostly in excess of ten years' old; many data are considerably older (Pollock & Barton 2006). Nonetheless, they represent the most comprehensive dataset available on the distribution and relative abundance of birds in UK waters (Stone *et al.* 1995), reflecting both the need to determine how representative they are of current distributions and to plug gaps in knowledge to ensure that proposed marine SPAs really are the "most suitable territories" (EU Birds Directive). Survey coverage offshore

has been particularly patchy in recent years, although there has been some limited resurvey of the outer Moray Firth, central North Sea and Dogger Bank for the Offshore Energy SEA (C. Barton, pers. comm.).

For Round 2 offshore wind farm development, the RSPB was instrumental in encouraging DTI/BERR/DECC (Department of Energy & Climate Change) to develop a coordinated programme of aerial surveys, in conjunction with developers and the WWT, over the three strategic areas of NW England (Liverpool Bay), the Greater Wash and the Greater Thames (DTI 2006, BERR 2007). This survey programme served the dual purpose of comprehensive coverage of large sea areas, providing contextual information as well as data for specific proposed sites for offshore wind farms, and more efficient deployment of scarce resources (skilled aerial survey ornithologists and suitable light aircraft). These aerial surveys were complementary to those carried out in targeted sea areas by the JNCC Seabirds at Sea team, and those commissioned by CCW. Aerial survey coverage of inshore waters has been good in recent years, at least for the winter months, notably in 2004/05 to 2007/08 (Figures 3, 4a & 4b – NB there is overlap of some JNCC survey coverage in these figures).

Land-based surveys, mainly collected by the Wetland Bird Survey (WeBS) or local *ad hoc* seawatching surveys and data from bird observatories, extend only a short distance offshore into coastal waters, mostly ranging from 500m to 2km, depending on weather conditions (e.g. Musgrove *et al.* 2003; Austin *et al.* 2008). These data provide an indication of species present in coastal waters and potentially of distributions further offshore.

Bird movements, foraging ranges, feeding concentration

Data from the UK ringing scheme provides information on origins and destinations, through recaptures and recovery of dead birds, but not routes taken between breeding and non-breeding areas, for many bird species (Wernham *et al.* 2002).

Foraging ranges vary both within and between species, and within and between seasons. Food availability and distribution in any one year will influence foraging range, as does the stage of the annual cycle (e.g. Ratcliffe *et al.* 2000). Provisioning growing chicks is a particularly demanding stage of the breeding season and different species have different adaptations to dealing with these pressures. For example, terns generally make many short foraging flights to provide multiple deliveries of food, whereas shearwaters may be away on a single foraging trip of more than 24 hours when they are feeding chicks. For terns, this leads to elevated flight activity between the breeding colony and proximate feeding areas, although the locations of the latter may change as prey availability changes. In a bad year, they may have to make longer flights to find food for their chicks, and chick survival is likely to be lower.

A wide range of seabird species has been recorded at increased densities at tidal mixing fronts, notably sub-surface and pursuit diving species such as northern fulmar, Manx shearwater, European storm petrel,

northern gannet and auks. Various fish species concentrate to feed on plankton blooms associated with these seasonal fronts. Species such as northern fulmar, European storm petrel and Leach's petrel often forage at the edge of the continental shelf. Shallow waters around sandbanks attract foraging seabirds that feed on sandeels, e.g. terns, divers, shags, auks, northern gannets, black-legged kittiwakes (various authors cited in Ratcliffe *et al.* 2000). Currently, there is fairly limited, but increasing, understanding of the complex relationships between marine features and seabird foraging behaviour.

Understanding foraging associations with particular environmental features in the oceans is essential for identifying offshore feeding aggregations for marine SPAs and for risk assessment of offshore wind farms. It is likely that multidisciplinary approaches will be necessary, together with combinations of techniques. For example, surveys of distribution and abundance alone are inadequate to determine the importance of a feeding location without also knowing which colony or colonies are the sources of feeding aggregations. Several studies of northern gannets illustrate this well, as birds from Bass Rock forage in parts of the North Sea that are closer to other gannetries than that at Bass Rock (Hamer *et al.* 2000). SPEA and SEO BirdLife in Spain have used a combination of approaches to identify marine Important Bird Areas (IBAs; SPEA & SEO 2006). Models of habitat suitability integrated with tracking data are promising for identifying feeding areas (Skov *et al.* 2008).

Increasingly, new technologies are being deployed to track birds, in particular to investigate foraging behaviour. Radiotelemetry has been used to track birds over relatively short distances and short timescales, e.g. little terns from breeding colonies at Great Yarmouth North Denes and Winterton in relation to Scroby Sands offshore wind farm (Perrow *et al.* 2006). GPS data loggers offer the ability to track birds over considerably greater distances and time frames, but necessitate recovery of the data logger to extract the information (Bluetooth technology is emerging, so potentially removing the requirement to recapture the bird). Data loggers are useful for site-faithful birds marked and recaptured in breeding colonies, e.g. Manx shearwater (Guilford *et al.* 2008) and black-legged kittiwake (Daunt *et al.* 2002). Satellite tracking offers the greatest potential to follow birds over potentially huge distances and over extended time periods, up to several years if solar powered devices are used, but at present only for birds of large body size, such as northern gannet (Hamer *et al.* 2000, 2001). This technology has particular value in elucidating bird migration routes. COWRIE has commissioned a research project to satellite-track whooper swans migrating to and from breeding grounds in Iceland, to determine the routes they use and contribute to a better understanding of collision risk in relation to wind farms in Liverpool Bay.

In terms of assessing risk associated with wind turbines, there is a need to distinguish the distance within which most foraging flights occur, rather than merely the extremes, as flight activity (number of flights, not just number of individual birds) levels are influential in determining risk. In the absence of colony-specific data, BirdLife International (BLI)'s recommendations for colony extensions, based on seabird foraging radii

(Ratcliffe et al. 2000, RSPB 2000), provide a useful reference point. Several recently published studies provide updated information (Table 1), although recent research on terns indicates that foraging range for Sandwich tern in particular may be greater than this (M. Perrow pers. comm.).

Table 1: Foraging radii around seabird breeding colonies. Table modified from Ratcliffe *et al.* 2000 & RSPB 2000.

Foraging Radius	Species
5 km	Little Tern Arctic Skua Black Guillemot
15 km	Manx Shearwater (rafting birds only) Cormorant Shag Black-headed Gull Common Gull
20 – 30 km	Common, Arctic, Roseate and Sandwich Tern*
40 km	Great Skua Herring, Lesser and Great Black-backed Gulls Kittiwake Guillemot Razorbill Puffin
> 100 km	Northern Fulmar Manx Shearwater European Storm Petrel Leach’s Petrel Northern Gannet

*BLI unpublished review of tern foraging ranges

Marine Protected Areas

At present, the main focus of work on marine protected areas for seabirds is the identification and designation of the Special Protection Area network into the marine environment. This work will extend to nationally important sites as and when relevant national level marine legislation is enacted.

Currently, offshore extensions to seabird breeding colonies are the main focus of attention for designating marine SPAs. The proposed colony extensions currently apply to those species for which sample sizes are adequate to determine densities of birds engaged in maintenance behaviour in the waters surrounding breeding colonies, namely northern fulmar *Fulmarus glacialis*, Manx shearwater *Puffinus puffinus*, northern gannet *Morus bassana*, common guillemot *Uria aalge*, razorbill *Alca torda* and Atlantic puffin *Fratercula arctica* (JNCC). These extensions are considered to represent concentrations of seabirds engaged in maintenance behaviours and do not necessarily reflect foraging ranges or main foraging locations, which will be the subject of separate SPA designations. Surveys extended up to just 4-5 km offshore (McSorley *et al.* 2003). To date, Scottish RSPB/RHWL/R3 & seabirds/17 November 2008

Natural Heritage (SNH) has proposed 31 colony extensions in Scotland, based on the modelled bird densities (Appendix II).

For northern gannet, significantly higher predicted average densities of birds, engaged in maintenance behaviour, were found within 2 km of the breeding colony than at greater distances, both around Grassholm off the Pembrokeshire coast and around Bass Rock in the Firth of Forth (McSorley *et al.* 2003). Thus, diminishing densities are likely further offshore, at least within the limited 4-5 km range of assessment around colonies, except at offshore feeding aggregations. In the case of Manx shearwater, the greatest use of waters around breeding colonies, notably for rafts formed towards dusk prior to visiting nests, was found to be 4 km around Skomer, 6 km around Rum, and 9 km at Bardsey Island (Reid & Webb 2005).

There are also proposals under development for marine SPAs in Liverpool Bay and the Greater Thames for wintering common scoters and divers respectively, as part of the plan for SPAs for inshore aggregations. Assessment of SPAs for offshore foraging areas, the third strand of SPA designation, is only in the early stages of investigation and is based primarily on spatial analysis of ESAS data.

As part of its work towards establishing SPAs, JNCC is using boat surveys, visual tracking of foraging flights and radio-tracking to identify foraging area extensions to SPAs for breeding red-throated divers *Gavia stellata*. They are carrying out aerial surveys to produce distribution and abundance data for terns *Sterna* species around key tern colonies. They are also collecting some additional field data to identify feeding aggregations of seabirds throughout the year in UK continental shelf waters. It would be valuable for JNCC to re-survey sample areas for which they have undertaken spatial analysis of ESAS data to determine whether similar patterns of distribution and abundance occur now. This would either increase confidence that the use of ESAS is fundamentally sound, or demonstrate that it is a flawed approach for defining SPA boundaries.

Risk factors in relation to offshore wind turbines

The main potential risks for birds are collision; disturbance/displacement; barriers to movement of e.g. migrating birds, or disruption to functional links, for example between feeding and breeding areas; and habitat change with associated changes in food availability.

Location remains the most important risk factor, in particular distance offshore and the level of flight activity by species with, or at times when, elevated collision risk is likely. The problem is that we know rather little about the locations of offshore feeding concentrations in UK waters, notably for birds from specific breeding colonies, but can begin to make some expert judgements about the likelihood of risk. There is a high potential risk of collision with wind turbines if they are located in areas in which there is a high level of flight activity by birds most likely to collide with turbine rotors or be affected by the associated turbulence. High levels of activity may be due to either feeding frenzies or high turnover of individuals using the area.

Risk level is a combination of distribution and behavioural characteristics of the species, which may vary seasonally and spatially as well as being age- and sex-dependent (Stienen *et al.* 2008). The evidence for terns is that they are generally manoeuvrable in flight, but flights occur within rotor swept height. Most tern collisions with the wind turbines at Zeebrugge coincided with incubation and chick provisioning and are likely to be attributable to the increased flight activity into and out of the colony and time pressures on the adult birds leading to them taking the most direct flights between breeding and feeding areas (Henderson *et al.* 1996, Everaert & Stienen 2007). The elevated collisions of male common terns were attributed to sex-biased variation in foraging activity during egg-laying and incubation (Stienen *et al.* 2008). When feeding chicks, they will generally forage closer to their breeding colonies unless failure of food supply forces them to forage further afield, so the collision risk for terns in several of the potential development zones for offshore wind farms has to be reduced because of their distance offshore. In the case of northern gannets, they plunge dive from 10-40 m above the water and fly within the rotor swept height but often forage over 100 km away from their breeding colonies and so easily within the range of likely R3 offshore wind farms. Understanding the relative importance and consistency of feeding aggregations will be key to assessing the level of risk for northern gannets.

Wind turbine size and hence the height of the rotor swept area will be critical to the risk of collision for birds offshore. Offshore swell affects wave height and hence flight elevation of species that generally fly close to the sea surface and wave crests, for example Manx shearwater. So, whilst such species may be generally considered low risk in terms of collision with wind turbines, specifically in the case of the particular international responsibility that the UK has for Manx shearwater, any proposed wind farm development within the main feeding and loafing areas will require detailed assessment. Species whose flight activity currently extends to heights within the rotor swept area may be less likely to fly within the rotor swept area of the next generation of larger turbines.

Currently, there is limited practical experience of the effects of offshore wind farms on birds, but there are several useful studies from Denmark and Sweden. Radar studies at Nysted offshore wind farm, in Denmark, indicated a high degree of avoidance by large waterbirds during migration, mostly common eider, at least in fair weather (Desholm & Kahlert 2005). There was a significant reduction in migration track densities within the wind farm area post-construction (40.4% ($n=1406$) of flocks entered the wind farm area prior to construction of the wind farm (2000-2002) compared with 8.9% ($n=779$) during initial operation (2003) ($\chi^2=239.9$, $p<0.001$). The birds' avoidance response was initiated at greater distance from the wind farm during daylight (≤ 3 km) than at night (≤ 1 km). A significantly higher proportion of migrating flocks entered the wind farm at night (13.8%; $n=289$), than during daylight (4.5%; $n=378$) ($\chi^2=17.1$, $p<0.001$). Aerial surveys of bird distribution and abundance and visual observations complemented the radar studies during daylight. Whilst flight activity

is often depressed in poor weather, birds already migrating and caught in bad weather are likely to reduce their flight height.

Similarly, radar and visual observations at Utgrunden and Yttre Stengrund in the Kalmar Sound, Sweden indicated that most migrating common eider avoided flying close to these small wind clusters (respectively 7 and 5 turbines in parallel with the main direction of migration) (Pettersson 2005). This study provides a rare observation of collision by individuals in a flock of common eiders. A flock of approximately 310 eiders, in V-formation, flew past an outer turbine when several individuals in the outer flank, and therefore the rear, of the flock struck the rotating blade on its downward trajectory or were caught in the associated turbulence. Four birds were observed to fall into the water, of which at least two flew out and at least one was killed.

Data from aerial surveys carried out before, during and following construction of the Horns Rev offshore wind farm, in Denmark, were used to evaluate possible displacement effects of wind turbines on birds (Petersen *et al.* 2004). Distributional changes within the wind farm, the wind farm area plus 2km radius and the wind farm area plus 4km radius were assessed. Divers and common scoters showed almost complete avoidance of the Horns Rev wind farm area in the first three years post construction (DONG *et al.* 2006). As proportions of the total numbers present, the displaced birds represented a relatively small proportion, but concerns were expressed about the potential for cumulative impacts of multiple wind farms along the flyway for these species. Subsequent surveys indicate that common scoters may now be utilising the sea areas within the wind farm in comparable densities within and outwith the wind farm, although the possibility cannot be excluded that changes in food availability rather than the presence of the wind farm led to the observed changes in distribution (Petersen & Fox 2007).

Displacement from the wind farm area may result from disturbance due to the presence of turbines or increased levels of boat traffic, or helicopters, and maintenance crews, or result from changes to food supply that may, or may not, be a consequence of the wind farm. Seaducks and divers are noted for their susceptibility to disturbance and for forming "rafts" on the water surface of anything from a few individuals to several thousand (or even tens of thousands of) birds. Their predominant association with shallow waters ≤ 20 m restricts the likely overlap with Round 3 zones for wind energy development, albeit realistically most development will be limited to water depths no greater than 30-40m initially.

The pressure to develop offshore wind farms in a relatively short timeframe prompted the production of a species sensitivity index for birds which was then applied to the German sectors of the North Sea and Baltic Sea (Garthe & Hüppop 2004). The species sensitivity index provides a useful measure to assist in prioritising bird species for assessing the risks applicable to the UK's Round 3 offshore wind farm programme (Table 2). The modified score for the UK is an initial assessment, and is not a substitute for updated baseline data

collection (i.e. ESAS data), detailed EIA, and targeted research, but intended to make best use of available information until these sources improve that knowledge base. The relative importance of the UK for a species may mean that the cumulative impact score is high even for species thought to have low risk values because the consequence of any impact would be more likely to be significant for the biogeographical population. It would be useful to update and apply the Garthe & Hüppop index in a UK context and to reflect more recent wind farm studies.

The ultimate test of impact, either for an individual development or cumulatively across multiple developments, is whether there is the likelihood of a decline in population size. There are two spatial scales at which this is relevant, SPA site condition assessment and the wider biogeographical population. Population models have some utility (Beissinger & Westphal 1998), but are heavily dependent on the available information, which is variable for different bird species (McLean et al. 2007). Furthermore, assumptions have to be made that may or may not result in model outcomes that are realistic, see for example the population model for northern gannets at Troup Head in response to predicted collision mortality arising from the Beatrice pilot wind farm (Ratcliffe 2005).

Priority species relevant to the zones proposed for offshore wind

Species of particular concern in relation to offshore wind development and therefore priority for environmental assessment, have been identified based on what is known of their distribution and ecology, notably their risk profile in relation to wind turbines, and conservation status in the UK (Table 2). Initially those species relevant to the CE zones are presented (Figure 1, Appendix III & supporting spreadsheet). The updated CE map (Figure 1) has dropped zones in Lyme Bay, off the Devon coast, in Cardigan Bay and off Whitehaven, but added Hornsea and West Isle of Wight. Species lists will require refinement in the light of further revisions by the CE, as a result of the SEA, and incorporation of regional information and updates from further surveys. Principal concerns are collision risk, displacement from habitat/feeding areas or major flight routes/frequently used flight paths between feeding and roosting areas for example (sometimes called the barrier effect), and especially the cumulative effects of these across multiple wind farms.

The application of an exclusion zone to inshore coastal waters and flexible siting of wind turbines within development zones to avoid areas of high bird use will reduce the risks to birds from R3 offshore wind development. The offshore energy SEA is considering the implications of variable exclusion zones for a variety of issues, especially landscape/seascape considerations (≤ 13 km), military training areas, avian interest and inshore fisheries. However, currently it is unclear whether and how any exclusion zone will be applied because of the high level of potential constraints identified. It is notable that there is little overlap between the R3 provisional zones and the indicative areas of search for inshore marine SPAs in English waters (NE

unpublished), although this reflects the tendency for most development zones to lie outside territorial waters but within the UK continental shelf waters. Two potential wind farm zones could overlap with potential colony extensions in the Moray Firth and Firth of Forth, with a possible third area of overlap off the Suffolk coast. Presently, it is not possible to indicate likely overlap between the potential development zones and future offshore marine SPAs, although earlier work by RSPB/BLI recommended that extensions to seabird breeding colonies should encompass feeding areas such as the Minch, Smith Bank, Wee Bankie and Marr Bank (RSPB 2000).

Species are listed, based on proximity to nearest major breeding colonies (most are SPAs) and likely foraging range for seabirds (RSPB 2000, Stroud *et al.* 2001, McSorley *et al.* 2003, Mitchell *et al.* 2004, Guilford *et al.* 2008) and, for non-breeding seabirds and waterbirds, based on the onshore SPA network, offshore distribution (non-breeding) including marine IBAs (Stroud *et al.* 2001, Skov *et al.* 2005, Stone *et al.* 2005), and migration (Wernham *et al.* 2002). For reasons stated above, the nearest colony may not be the origin of a significant proportion of the birds recorded, but such distinction will be possible only following further investigation. In the absence of further research, there is a case to be made for including SPAs within the likely main foraging range (Table 1). The focus on major breeding colonies, those that are numerically most significant based on Apparently Occupied Nests (AON) or Apparently Occupied Territories (AOT) as per Mitchell *et al.* (2004), is an attempt to tease out areas and species of relatively greater biological significance from the UK coastline's almost uninterrupted conservation importance for breeding seabirds. The information presented here is indicative of likely occurrence and priority. All species that contribute to the qualifying interest of the SPAs within the likely range of birds using the potential development areas for wind farms will require consideration at the scoping stage of the EIA. The proposed "key features" approach to scoping provides a useful framework (A. Prior, unpublished 2008).

Migrating birds (e.g. waders) may enter the collision risk zone if forced to fly at lower elevation because they encounter strong headwinds or bad weather during a sea crossing, or when approaching land, and so need to be included in the EIA risk assessment. Migration may be low over the water when making short sea crossings or at high elevations, well above turbine height, when unimpeded; birds fly at the altitude that maximizes flight efficiency. Many migrants will fly along or within a few kilometres of the coast to avoid making a long distance sea crossing. For example, many waterbirds migrating from the Arctic or other northern breeding grounds migrate through the Baltic or down the Norwegian coast to the Wadden Sea before crossing to the UK. However, some birds cross the North Sea from Scandinavia. Radar could be a useful tool in elucidating current migration patterns across the North Sea, as well as tracking more local offshore movements.

Table 2: Species for which studies at wind farms, or other known aspects of behaviour, indicate higher risks (e.g. Garthe & Hüppop 2004) or for which priority conservation status and uncertainty about likely impacts contribute to them being identified as focal species in relation to proposed wind farms.

Species	Collision ¹	Displacement ¹	Barrier ¹	Habitat/ Prey ¹	SSI ²	GB/UK Min % ³	Cumulative Impact ⁴
Black-throated Diver	*	***		*	44.0	*	***
Red-throated Diver	*	***		*	43.3	**	***
Velvet Scoter		**		**	27.0	*	**
Sandwich Tern	**			*	25.0	**	**
Great Cormorant	**	*			23.3	**	**
Common Eider	*	*		**	20.4	*	**
Great black-backed Gull	**				18.3	**	**
Common scoter		*		**	16.9	*	**
Northern Gannet	**				16.5	***	***
Razorbill		*		?	15.8	*	**
Atlantic Puffin		*		?	15.0	*	**
Common Tern	**				15.0	*	**
Lesser black-backed Gull	**				13.8	***	***
Arctic Tern	**				13.3	*	**
Little Gull	*				12.8	?	?
Great Skua	**				12.4	***	***
Common Guillemot		*		?	12.0	**	**
Mew (Common) Gull	*				12.0	*	**
Herring Gull	*				11.0	*	**
Arctic Skua	**				10.0	*	**
Black-legged Kittiwake	**				7.5	*	*
Black-headed Gull	*				7.5	*	*
Northern Fulmar	*				5.8	*	*
Great Northern Diver		***		*	ns	**	***
Manx Shearwater	?	?		?	ns	***	***
Balearic Shearwater	?	?		?	ns	?	?
European Storm-petrel		?		?	ns	*	*
Leach's Storm petrel		?		?	ns	*	*
European Shag		*		*	ns	**	**
Roseate Tern	**				ns	*	**
Little Tern	*				ns	*	*
Mediterranean Gull	*				ns	*	*
Long-tailed Duck		**		**	ns	*	**
Goldeneye		?		?	ns	*	?
Red-breasted Merganser		?		?	ns	*	?
Whooper Swan	**				ns	*	**
Bewick's Swan	**				ns	**	**
Pink-footed Goose	*				ns	***	***
Dark-bellied Brent Goose	*				ns	?	?
Light-bellied Brent Goose	*				ns	?	?

¹assessment based on combination of experience from operational wind farms and Garthe & Hüppop 2004.

²ns = no Species-specific Sensitivity Index (SSI) score presented in Garthe & Hüppop 2004; NB this score takes account of SPEC status.

³ The minimum % of the relevant biogeographical population breeding in Britain, is taken from Mitchell *et al.* 2004; UK non-breeding population estimates are from Baker *et al.* 2006 as a % of European populations from BirdLife International 2004, converted accordingly: * < 25%; ** 25 – 50 %; *** > 50%.

⁴cumulative impact taken as the highest score across the table for each species

Data collection for environmental assessment

In view of the paucity of recent data for most offshore areas, year-round baseline data collection will be needed for all species (not just those listed in Appendix III because they are thought to be the most likely priority species) in potential development zones and other areas proposed for wind farm development, to cover breeding and non-breeding distributions. Migration of seabirds, waterbirds and passerines occurs around the UK, notably across the North Sea and the Channel, so spring and autumn surveys will be needed. Radar may be a valuable adjunct in some cases, for example assessing migration traffic or tracking movements of individual species groups such as geese. As with Round 2, previously unknown bird concentrations may be identified during additional data collection.

Baseline survey requirements will need to extend offshore, owing to a high proportion of the potential development zones occurring outside territorial waters. This will present new challenges to determine how best to deploy the standard techniques. Light aircraft used for aerial survey have limited flying range which will constrain the number of transects that can be flown over outermost zones in one day, but boat-based surveys of the larger zones would require many days, increasing the risk of double-counting as birds move around within the zone and surrounding waters. Review of transect separation may be necessary, but bearing in mind implications for estimations of bird density. Plugging gaps in the inshore waters aerial survey programme remains a high priority for those potential development zones within territorial waters, e.g. in the Channel, and for identification of inshore SPAs. There are few inshore blocks that have received no coverage to date, but quite a few that have been surveyed only once, notably during summer. Whilst data collection for individual wind farms is the responsibility of the developer, coordinated survey effort maximises the provision of contextual information and makes best use of limited resources, as demonstrated for R2 (Figures 4a & 4b), so is to be encouraged for R3. Comprehensive survey of UK Continental Shelf (UKCS) waters is unrealistic, being impractical and hugely costly, but sample surveys are essential, as mentioned elsewhere in this paper, to validate the applicability of ESAS data to current patterns of distribution and abundance of seabirds. The requirements for information prompted by R3 (including Scottish Territorial Waters, although not strictly part of R3) and designation of marine SPAs are joint drivers for coordinated survey effort and funding.

Once the range of species present in each wind farm proposal area has been established, further studies should focus on addressing specific questions for priority species relevant to each zone or application area, as required to improve our understanding of the potential environmental effects of wind farms. The scoping stage of environmental impact assessments will be crucial to ensure that resources are targeted at the most relevant studies. Such studies include tracking individual birds to establish foraging areas for birds in relation to particular development areas and specific coastal breeding colonies.

Recommendations

1. Comprehensive baseline data collection, using a combination of aerial and ship-based surveys using recommended methods (Camphuysen et al. 2004). Minimum of 2 years pre-construction data collection for potential development zones.
2. Survey programme to plug gaps in coverage and provide updated contextual information for UKCS waters. To include sample re-surveys of areas covered by ESAS, to determine whether broad patterns of distribution and abundance remain unchanged or whether there have been changes that cast doubt on the value of ESAS data for identifying marine SPAs or areas of potential greater sensitivity for wind farm development.
3. Encourage and facilitate further research into foraging ranges and areas used by priority species relevant to each development zone, making use of developing technology such as data loggers and habitat suitability modelling (also relevant to identification of marine SPAs).
4. Consider development of further sensitivity indices for birds in the marine environment.
5. Collate and, where necessary seek to improve, information on population size, survival and productivity, age structure and frequency of non-breeding to facilitate population modelling for priority species.
6. Encourage and facilitate further research into migration and other flight movements at sea, notably to elucidate routes and variation in these by bird species of conservation priority. Further deployment of satellite tracking with enhanced frequency of positional information shows most promise, but currently is technically restricted to larger seabirds and waterbirds. This is an extension of 3.
7. Deployment of radar offshore, on fixed platforms post-construction, to improve our understanding of avoidance responses by e.g. migratory waterbirds or seabirds commuting to foraging areas (Desholm *et al.* 2005, 2006). Resolve how best to obtain complementary visual observations or use of thermal imaging cameras.
8. Deployment of land-based radar¹ and complementary visual observations at several key locations, pre-construction, to observe departure and arrival bearings and flight elevation of migratory birds. This is primarily to determine whether flight height gain/loss occurs close to the coast, i.e. landward of the likely offshore wind development areas (allowing for weather conditions). Offshore deployment of radar to augment baseline data collection also potentially valuable for specific cases.
9. Encourage and facilitate the development of study techniques and, where applicable, mitigation measures for application in the marine environment and at offshore wind farms.

¹ It is unlikely that this function can be fulfilled using the mobile avian radars, but will require more powerful radar.

Acknowledgements

Thanks to David Fouracre, RSPB's Conservation Data Management Unit for preparation of the maps included here, and to Ian Mitchell, JNCC, for seabird colony and SPA data, Phil Bloor, BERR (now DECC), Andy Webb, JNCC, Rebecca Woodward, WWT, Hannah Cherry, The Crown Estate, for GIS data layers that contributed to map production. Thanks also to Gavin Bloomfield, Mark Bolton, Andrew Dodd, Ian Francis, Toby Gethin, Alison Giacomelli, Kate Jennings, Martin Kerby, Tim Melling, Aedan Smith, Sharon Thompson, Kirsty Turner and Mike Webb for feedback on aspects of the document, and to Martin Harper for providing the RSPB policy text.

References

- Austin, G. E., Collier, M. P., Calbrade, N. A., Hall, C. & Musgrove, A. J. 2008. Waterbirds in the UK 2006/07: The Wetland Bird Survey. BTO/WWT/RSPB/JNCC, Thetford.
- Baker, H., Stroud, D. A., Aebischer, N. J., Cranswick, P. A., Gregory, R. D., McSorley, C. A., Noble, D. G. & Rehfisch, M. M. 2006. Population estimates of birds in Great Britain and the United Kingdom. *Brit. Birds* 99: 25-44.
- Beissinger, S. R. & Westphal, M. I. 1998. Invited paper on the use of demographic models of population viability in endangered species management. *J. Wildl. Manage.* 62(3):821-841.
- BirdLife International. 2004. *Birds in Europe: population estimates, trends and conservation status*. Cambridge, UK: BirdLife International. (BirdLife Conservation Series No. 12).
- Camphuysen, C.J., Fox, A.D., Leopold, M.F. & Petersen, I.K. 2004. *Towards Standardised Seabirds at Sea Census Techniques in Connection with Environmental Impact Assessments for Offshore Wind Farms in the UK: a comparison of ship and aerial sampling methods for marine birds and their applicability to offshore wind farm assessments*. Report to COWRIE, Royal Netherlands Institute for Sea Research, Texel, The Netherlands. www.offshorwindfarms.co.uk
- Daunt, F., Benvenuti, S., Harris, M. P., Dall'Antonia, L., Elston, D. A., & Wanless, S. 2002. Foraging strategies of the black-legged kittiwake *Rissa tridactyla* at a North Sea colony: evidence for a maximum foraging range. *Mar Ecol Prog Ser* 245: 239 – 257.
- Department for Business Enterprise & Regulatory Reform (BERR). 2007. *Aerial surveys of waterbirds in strategica wind farm areas: 2005/06 final report*. DBERR, London.
- Department of Trade & Industry. 2006. *Aerial surveys of waterbirds in strategica wind farm areas: 2004/05 final report*. DBERR, London.
- Desholm, M., Fox, A.D. & Beasley, P. 2005. *Best Practice Guidance for the Use of Remote Techniques for Observing Bird Behaviour in Relation to Offshore Wind Farms*. Report commissioned by COWRIE, COWRIE-REMOTE-05-2004. The Crown Estate, London. www.offshorwindfarms.co.uk
- Desholm, M., Fox, A.D., Beasley, P. & Kahlert, J. 2006. Remote techniques for counting and estimating the number of bird-wind turbine collisions at sea: a review. In *Wind, Fire & Water: Renewable Energy and Birds*, Proceedings of the BOU Conference, University of Leicester, 1-3 April 2005. *Ibis* 148 (Suppl. 1): 76-89.
- Desholm, M. & Kahlert, J. 2005. Avian collision risk at an offshore wind farm. *Royal Society Biol. Lett.* 1:296-298.
- DONG Energy, Vattenfall, The Danish Energy Authority, The Danish Forest and Nature Agency. 2006. Danish Offshore Wind – Key Environmental Issues. The Danish Energy Authority, <http://ens.netboghandel.dk>
- Everaert, J. & Stienen, E. W. M. 2007. Impact of wind turbines on birds in Zeebrugge (Belgium) Significant effect on breeding tern colony due to collisions. *Biodiversity and Conservation* 16: 3345-3359.
- Garthe, S. & Hüppop, O. 2004. Scaling possible adverse effects of marine wind farms on seabirds: developing and applying a vulnerability index. *J. appl. Ecol.* 41: 724-734.
- Guilford, T. C., Meade, J., Freeman, R., Biro, D., Evans, T., Bonadonna, F., Boyle, D., Roberts, S. & Perrins, C. M. 2008. GPS tracking of the foraging movements of Manx Shearwaters *Puffinus puffinus* breeding on Skomer Island, Wales. *Ibis* 150: 462-473. doi: 10.1111/j.1474-919x.2008.00805.x

- Hamer, K. C., Phillips, R. A., Wanless, S., Harris, M. P., & Wood, A. G. 2000. Foraging ranges, diets and feeding locations of gannets *Morus bassanus* in the North Sea: evidence from satellite telemetry. *Mar Ecol Prog Ser* 200: 257-264.
- Hamer, K. C., Phillips, R. A., Hill, J. K., Wanless, S., & Wood, A. G. 2001. Contrasting foraging strategies of gannets *Morus bassanus* at two North Atlantic colonies: foraging trip duration and foraging area fidelity. *Mar Ecol Prog Ser* 224: 283-290.
- Henderson, I.G., Langston, R.H.W. & Clark, N.A. 1996. The response of common terns *Sterna hirundo* to power lines: an assessment of risk in relation to breeding commitment, age and wind speed. *Biol. Cons.* 77: 185-192.
- Huntley, B., Green, R., Collingham, Y. & Willis, S. G. 2007. *A Climatic Atlas of European Breeding Birds*. Lynx Edicions, Barcelona. 521pp.
- IPPR, WWF & RSPB. 2007. *The 80% Challenge: delivering a low-carbon UK*. Institute of Public Policy Research/Worldwide Fund for Nature/ RSPB report. WWF, Godalming.
- Kershaw, M. & Cranswick, P. A. 2003. Numbers of wintering waterbirds in Great Britain, 1994/1995 – 1998/1999: I. Wildfowl and selected waterbirds. *Biol. Cons.* 111: 91-104.
- Maclean, I. M. D., Frederiksen, M. & Rehfish, M. M. 2007. Potential use of population viability analysis to assess the impact of offshore wind farms on bird populations. Report commissioned by COWRIE, COWRIE PVA-03-07, London.
- McSorley C. A., Dean B. J., Webb A. & Reid J. B. 2003. *Seabird use of waters adjacent to colonies: Implications for seaward extensions to existing breeding seabird colony Special Protection Areas*. JNCC Report, No. 329, Peterborough.
- Mitchell, P. I., Newton, S. F., Ratcliffe, N. & Dunn, T. E. 2004. *Seabird Populations of Britain and Ireland*. T & A D Poyser, London.
- Musgrove, A. J., Langston, R. H. W., Baker, H. & Ward, R. M. 2003. *Estuarine Waterbirds at Low Tide: the WeBS Low Tide Counts 1992/93 to 1998/99*. WSG/BTO/WWT/RSPB/JNCC, Thetford.
- O'Brien, S. H., Wilson, L. J., Webb, A. & Cranswick, P. A. 2008. Revised estimate of numbers of wintering Red-throated Divers *Gavia stellata* in Great Britain. *Bird Study* 55: 152-160
- Perrow M. R. Skeate E. R., Lines P., Brown D. and Tomlinson M. L. 2006. Radio telemetry as a tool for assessing impacts of windfarms: the case of Little Terns *Sterna albifrons* at Scroby Sands, Norfolk, UK. *Ibis* 148:57-75.
- Petersen, I.K., Clausager, I. & Christensen, T.J. 2004. *Bird Numbers and Distribution on the Horns Rev Wind Farm Area. Annual Status Report 2003*. Report commissioned by Elsam Engineering A/S 2003. National Environmental Research Institute, Rønde, Denmark.
- Petersen, I.K., Clausager, I. & Fox, A. D. 2007. *Changes in bird habitat utilisation around the Horns Rev 1 offshore wind farm, with particular emphasis on Common Scoter*. Report to Vattenfall A S by NERI, University of Aarhus, Denmark.
- Pettersson, J. 2005. The impact of offshore wind farms on bird life in southern Kalmar Sound, Sweden. A final report based on studies 1999-2003. Report to the Swedish Energy Agency. ISBN 91-631-6878-2
- Pollock, C. & Barton, C. 2006. An analysis of ESAS seabird surveys in UK waters to highlight gaps in coverage. Report to the DTI, Cork Ecology.
- Prior, A. 2008. Cumulative impact assessment and the regulatory context. An unpublished discussion paper prepared for the COWRIE cumulative impacts workshop, held 2 October 2008, Peterborough. PMSS, Bath.
- Ratcliffe, N., Phillips, R. A., & Gubbay, S. 2000. *Foraging ranges of UK seabirds from their breeding colonies and its implication for creating marine extensions to colony SPAs*. Unpublished Report to BirdLife International, RSPB, Sandy.
- Ratcliffe, N. 2005. Modelling the population trajectory of the Troup Head Gannetry in relation to predicted mortality from the Beatrice pilot windfarm project. Unpublished internal RSPB report.
- Reid, J. & Webb, A. 2005. *Marine Natura 2000 – Recommendations for the extension of existing seabird (colony) Special Protection Areas into the marine environment*. JNCC 05 P14B. JNCC, Peterborough.
- RSPB. 2000. *The development of boundary selection criteria for the extension of breeding seabird Special Protection Areas into the marine environment*. RSPB/BirdLife International, Sandy.

- Skov, H., Durinck, J., Leopold, M. F. & Tasker, M. L. 1995. *Important bird areas for seabirds in the North Sea including the Channel and the Kattegat*. BirdLife International, Cambridge.
- Skov, H., Humphreys, E., Garthe, S., Geitner, K., Grémillet, D., Hamer, K. C., Hennicke, J., Parner, H. & Wanless, S. 2008. Application of habitat suitability modeling to tracking data of marine animals as a means of analyzing their feeding habitats. *Ecological Modelling* 212: 504-512.
- SPEA & SEO/BirdLife. 2006. Implementing N2000 in the marine environment – Marine IBAs: Lisbon-Vilanova Conclusions. Summary report of EU LIFE project LIFE04NAT/PT/000213 .
- Stienen, E. W. M., Courtens, W., Everaert, J., & van de Walle, M. 2008. Sex-biased mortality of common terns in wind farm collisions. *The Condor* 110(1): 154-157.
- Stone, C. J., Webb, A., Barton, C., Ratcliffe, N., Reed, T. C., Tasker, M. L., Camphuysen, C. J. & Pienkowski, M. W. 1995. *An atlas of seabird distribution in north-west European waters*. JNCC, Peterborough.
- Stroud, D. A., Chambers, D., Cook, S., Buxton, N., Fraser, B., Clement, P., Lewis, P., McLean, I., Baker, H. & Whitehead, S. 2001. *The UK SPA network: its scope and content*. JNCC, Peterborough.
- Thomas, C. D., Cameron, A., Green, R. E., Bakkenes, M., Beaumont, L. J., Collingham, Y. C., Erasmus, B. F. N., de Siqueira, M. F., Grainger, A., Hannah, L., Hughes, L., Huntley, B., van Jaarsveld, A. S., Midgley, G. F., Miles, L., Ortega-Huerta, M. A., Townsend Peterson, A., Phillips, O. L. & Williams, S. E. 2004. Extinction risk from climate change. *Nature* 427: 145-148.
- Wernham, C. V., Toms, M. P., Marchant, J. H., Clark, J. A., Siriwardena, G. M., & Baillie, S. R. (eds). 2002. *The Migration Atlas: movements of the birds of Britain and Ireland*. T & A D Poyser, London.

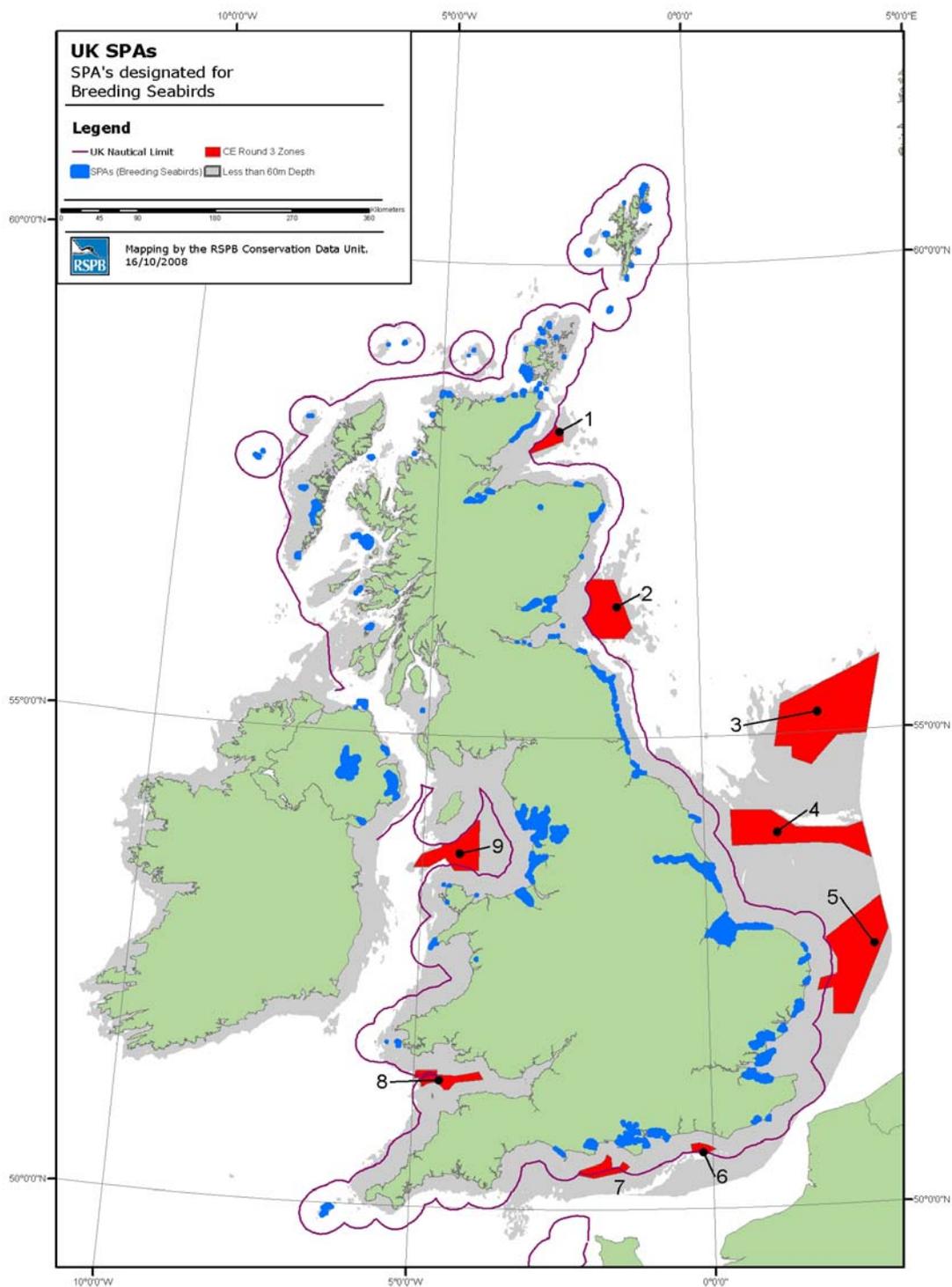


Figure 1 Bathymetry (waters < 60m) and SPAs with breeding seabirds as qualifying features in relation to CE potential development zones, September 2008, for offshore wind in UK waters

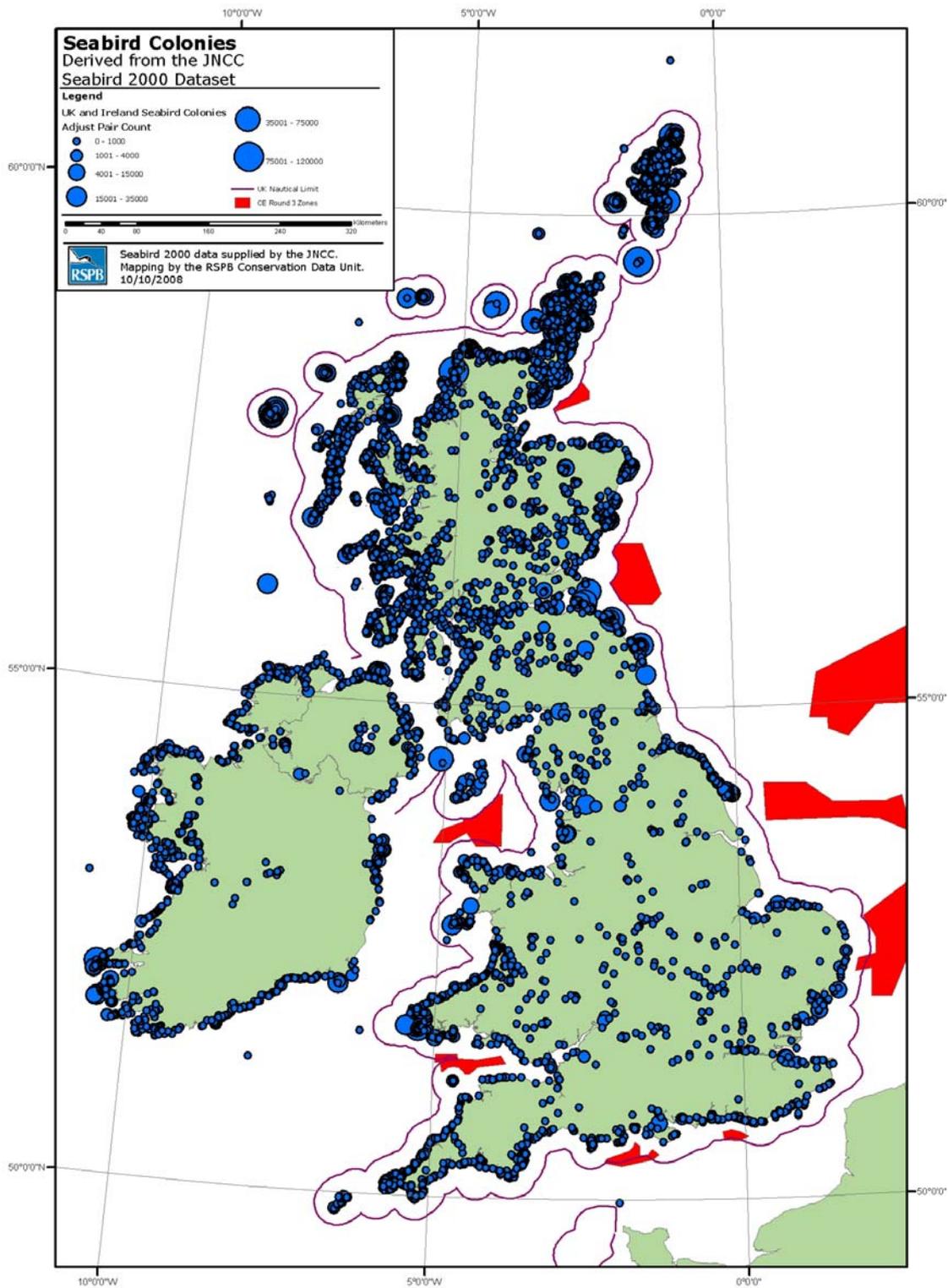


Figure 2: Seabird colonies in the UK (derived from the JNCC Seabird 2000 dataset)

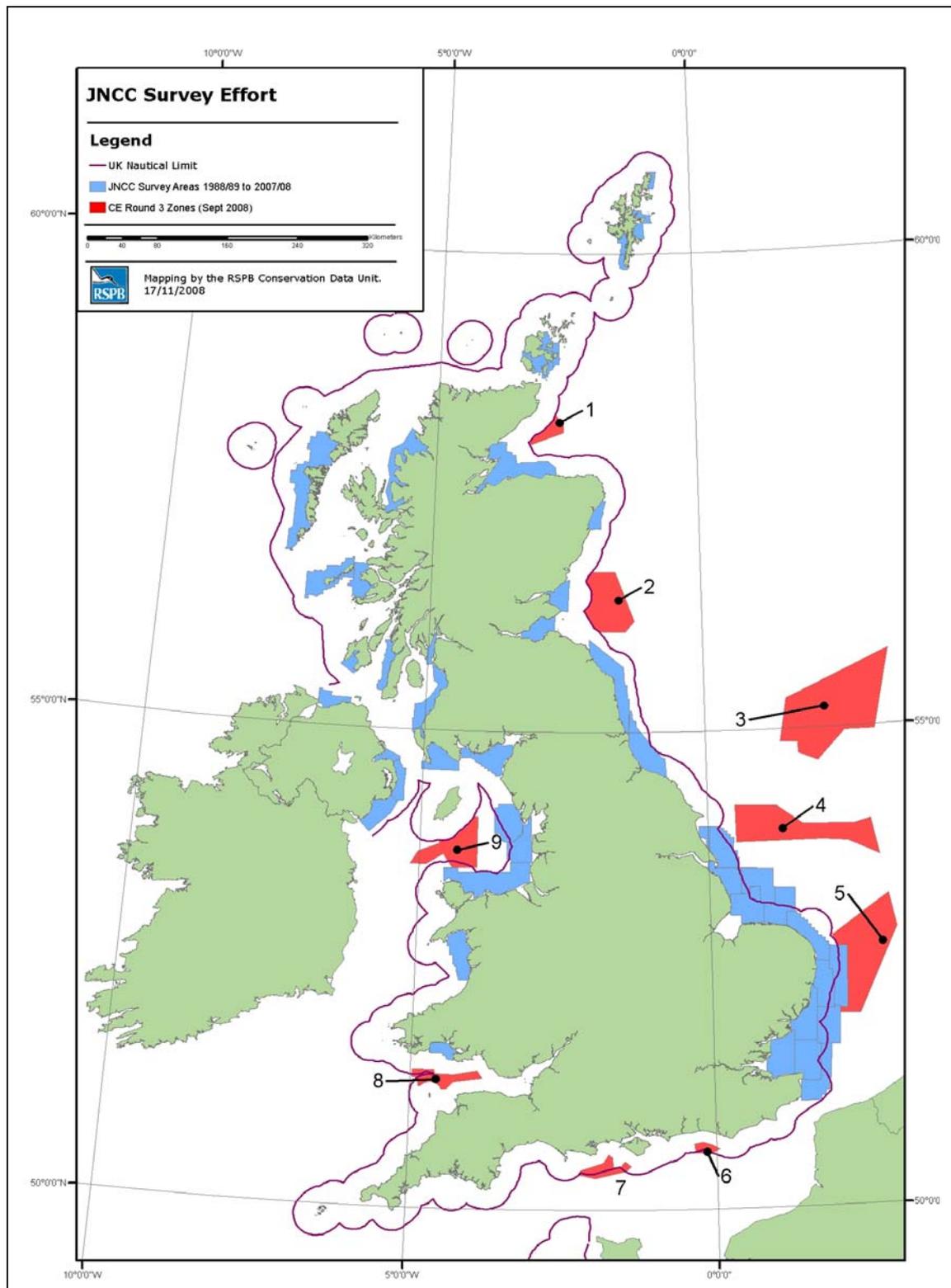


Figure 3: Aerial survey coverage of UK inshore waters 1988/89 to 2007/08 by the JNCC (NB, there is some overlap with Figure 4, notably for winter coverage)

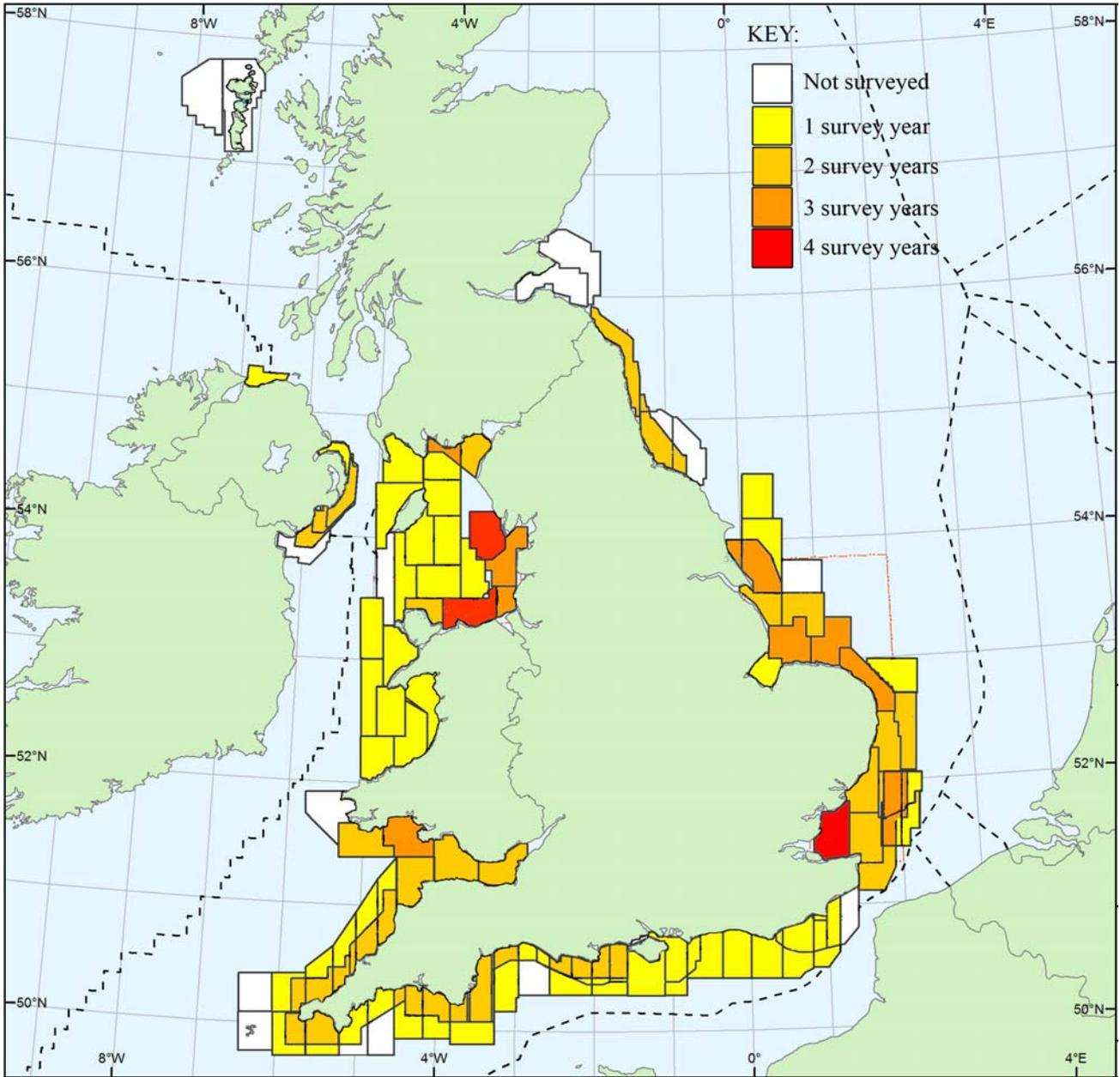


Figure 4a Winter survey coverage of UK waters by aerial surveys (unpublished information compiled from DECC, JNCC & WWT, figure courtesy of WWT)

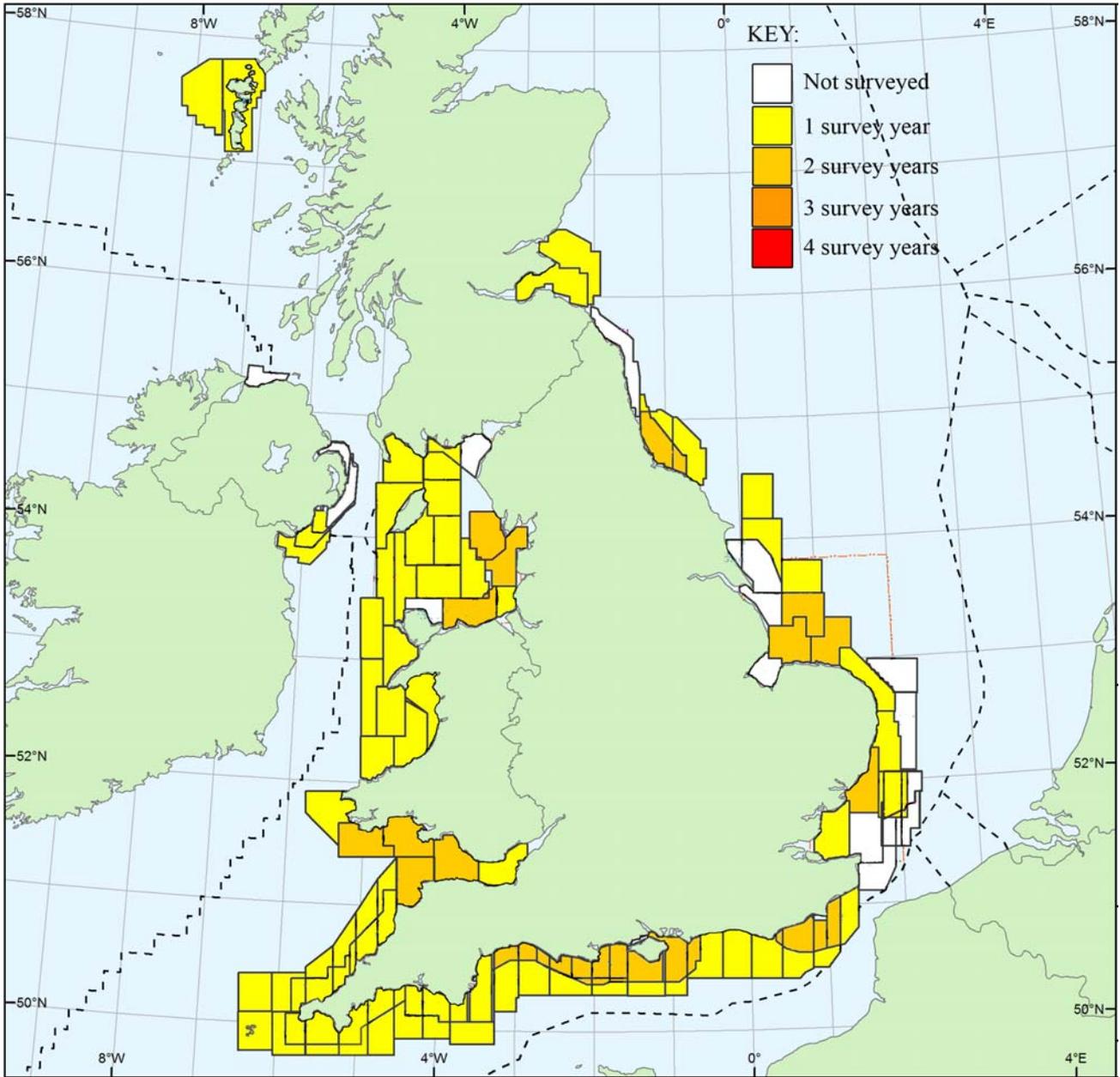
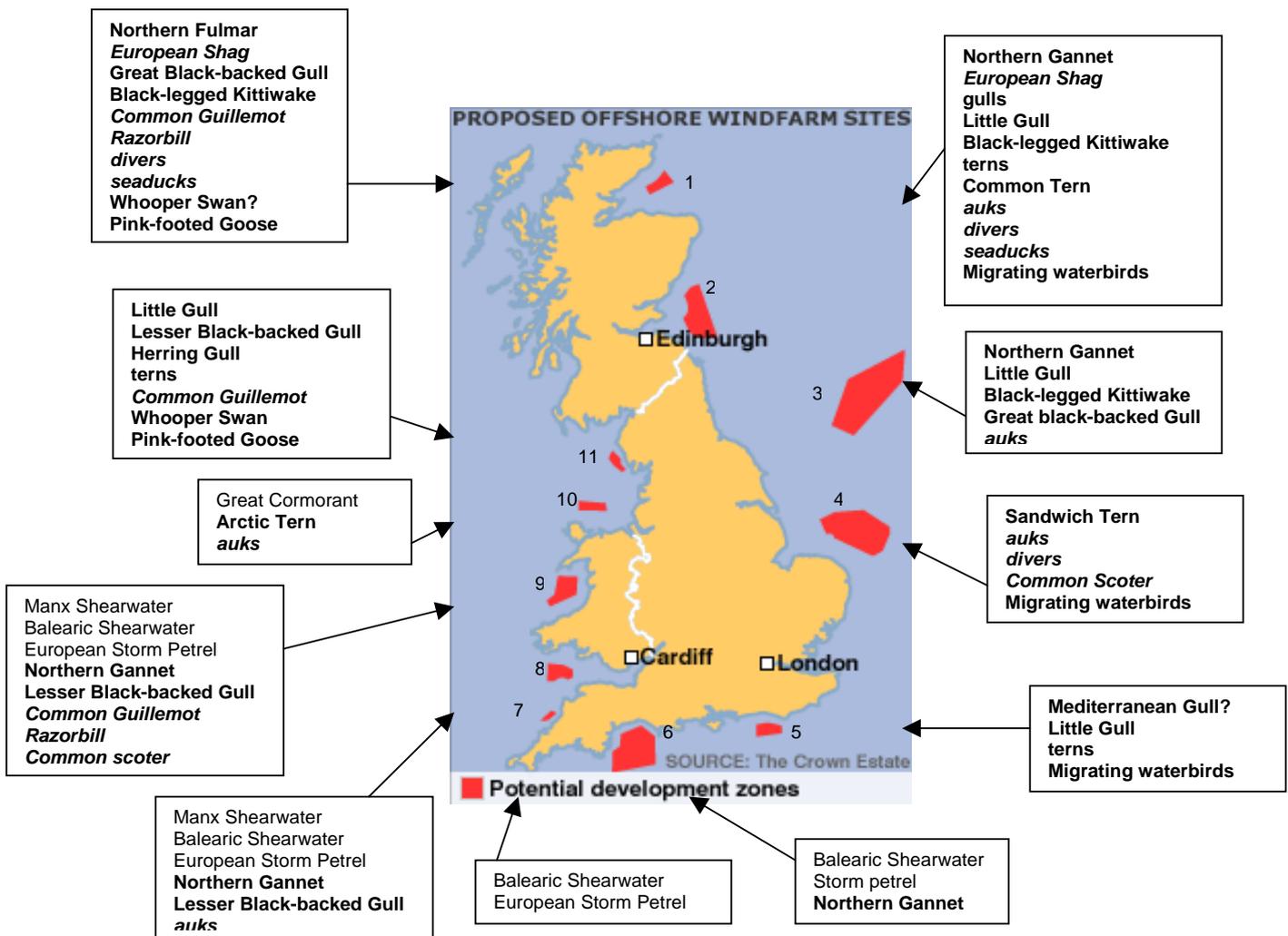


Figure 4b Summer survey coverage by aerial surveys (unpublished information compiled from DECC, JNCC & WWT, figure courtesy of WWT)

Appendix I: First Round 3 offshore wind farm announcement, The Crown Estate, 4 June 2008

Focal bird species for survey and research.

There is limited current information about offshore distributions, so these lists are not comprehensive, but aim to identify species of greatest potential concern in the areas indicated by the Crown Estate. Year-round baseline data collection will be needed for all species (not just those listed) and locations to cover breeding and non-breeding distributions. Migration of seabirds, waterbirds and passerines occurs around the UK, notably across the North Sea and the Channel, so spring and autumn surveys will be needed. Just as with Round 2, previously unknown bird concentrations may be identified during additional data collection. Principal concerns are collision risk, displacement from habitat/feeding areas or major flight routes, and especially the cumulative effects.



Species are listed, based on proximity to nearest major breeding colonies (including SPAs) and likely foraging range^{1,2,3,6} for seabirds and, for non-breeding seabirds and waterbirds, based on the onshore SPA network⁶, offshore distribution (non-breeding) including marine IBAs^{4,5}, and migration⁷.

Other migratory birds (e.g. waders) may enter the risk zone if they encounter strong headwinds or bad weather during sea crossing, or when flying at lower elevation close to land, and so need to be included in EIA risk assessment.

Key to main concern: **potential collision; possible displacement**

¹Guilford et al. 2008. GPS tracking of the foraging movements of Manx Shearwaters Puffinus puffinus breeding on Skomer Island, Wales. Ibis OnLineEarly

²McSorley et al. 2003. Seabird use of waters adjacent to colonies. JNCC report 329, Aberdeen

³Mitchell et al. Seabird Populations of Britain and Ireland. 2004. A & C Black, London

⁴Skov et al 1995. Important bird areas for seabirds in the North Sea including the Channel and the Kattegat. BLI, Cambridge

⁵Stone et al. 1995. An atlas of seabird distribution in north-west European waters. JNCC, Peterborough

⁶Stroud et al. 2001. The UK SPA network: its scope and content. JNCC, Peterborough

⁷Wernham et al. 2002. The Migration Atlas: movements of the birds of Britain and Ireland. T & A D Poyser, London

Appendix II: Proposed seabird breeding colony extensions in Scotland (see www.snh.gov.uk/)

Name of site	Approx. extension	Species for which extension proposed					
		Common Guillemot	Manx Shearwater	Razorbill	Atlantic Puffin	Northern Gannet	Northern Fulmar
Canna & Sanday	1km	*			*		
Marwick Head	1km	*					
North Colonsay & Western Cliffs	1km	*					
Rum	4km	*	*				
St Abbs to Fast Castle	1km	*		*			
Ailsa Craig	2km	*				*	
Buchan Ness to Collieston Coast	2km	*					*
Calf of Eday	2km	*					*
Cape Wrath	2km	*		*	*		*
Copinsay	2km	*					*
East Caithness Cliffs	2km	*		*	*		*
Fair Isle	2km	*		*	*	*	*
Fetlar	2km	*					*
Forth Islands	2km	*		*	*	*	*
Flannan Isles	2km	*		*	*		*
Foula	2km	*		*	*		*
Fowlsheugh	2km	*		*			*
Handa	2km	*		*			*
Hermaness, Saxa Vord & Valla Field	2km	*			*	*	*
Hoy	2km	*			*		*
Mingulay & Berneray	2km	*		*	*		*
North Caithness Cliffs	2km	*		*	*		*
North Rona & Sula Sgeir	2km	*		*	*	*	*
Noss	2km	*			*	*	*
Rousay	2km	*					*
Shiant Isles	2km	*		*	*		*
St Kilda	4km	*	*	*	*	*	*
Sule Skerry & Sule Stack	2km	*			*	*	
Sumburgh Head	2km	*					*
Troup, Pennan & Lion's Head	2km	*		*			*
West Westray	2km	*		*			*

These extensions are considered to represent concentrations of seabirds engaged in maintenance behaviours and do not necessarily reflect foraging ranges or main foraging locations, which will be the subject of separate SPA designations.

Appendix III: Priority species likely to be of most concern in CE potential development zones
(September 2008 update).

CE zone	Location	Bird species
1	Moray Firth	Northern Fulmar
		<i>European shag</i>
		Great black-backed gull
		Black-legged kittiwake
		<i>Common guillemot</i>
		<i>Razorbill</i>
		<i>divers</i>
		<i>seaducks</i>
		Whooper Swan?
		Pink-footed Goose?
2	Firth of Forth	Northern Gannet
		Black-legged Kittiwake
		gulls
		Little Gull
		Sandwich Tern
		Common Tern
		Arctic Tern
		<i>auks</i>
		<i>divers</i>
		<i>seaducks</i>
		Migrating waterbirds
3	Dogger Bank	Northern Gannet
		gulls
		Black-legged Kittiwake
		<i>auks</i>
4	Hornsea	Northern Gannet
		Little Gull
		Black-legged Kittiwake
		<i>auks</i>
		Migrating waterbirds
5	East of Norfolk & Suffolk	Little Gull
		Little Tern
		<i>auks?</i>
		<i>divers</i>
		Migrating waterbirds
6	Hastings	Mediterranean Gull
		Little Gull
		Migrating waterbirds
7	West Isle of Wight	<i>Balearic Shearwater</i>
		<i>European Storm Petrel</i>
		terns
		Mediterranean Gull
		Migrating waterbirds

8	Bristol Channel	<i>Manx Shearwater</i>
		<i>Balearic Shearwater</i>
		<i>European Storm Petrel</i>
		Northern Gannet
		Lesser Black-backed Gull
		<i>auks</i>
9	Irish Sea	<i>Manx Shearwater</i>
		terns
		<i>auks</i>

Key to main concern: **potential collision**; *possible displacement*

Focal bird species for survey and research

These lists aim to identify those species likely to be of greatest potential concern in the potential development zones indicated by the Crown Estate (September 2008 revision). Year-round baseline data collection will be needed for all species (not just those listed) and locations to cover breeding and non-breeding distributions. Migration of seabirds, waterbirds and passerines occurs around the UK, notably across the North Sea and the Channel, so spring and autumn surveys will be needed. Just as with Round 2, previously unknown bird concentrations may be identified during additional data collection. Principal concerns are collision risk, displacement from habitat/feeding areas or major flight routes, and especially the cumulative effects.

Species are listed, based on proximity to nearest major breeding colonies (including SPAs) and likely foraging range^{1,2,3,4,7} for seabirds and, for non-breeding seabirds and waterbirds, based on the onshore SPA network⁷, offshore distribution (non-breeding) including marine IBAs^{5,6}, and migration⁸. The supporting Excel spreadsheet lists all species which contribute to the qualifying interest of the nearest SPAs; all these species will require consideration at the scoping stage of the EIA. The proposed “key features” approach to scoping may be useful (A. Prior, unpublished 2008). Migratory birds (e.g. waders) may enter the risk zone if they encounter strong headwinds or bad weather during sea crossing, or when flying at lower elevation close to land, and so need to be included in EIA risk assessment.

This table will be revised in the light of the Offshore Energy SEA and associated revisions by the Crown Estate, further surveys, documentary evidence and research information, as an iterative process involving consultation.

¹Guilford et al. 2008. GPS tracking of the foraging movements of Manx Shearwaters *Puffinus puffinus* breeding on Skomer Island, Wales. *Ibis* OnLineEarly

²McSorley et al. 2003. Seabird use of waters adjacent to colonies. JNCC report 329, Aberdeen

³Mitchell et al. Seabird Populations of Britain and Ireland. 2004. A & C Black, London

⁴RSPB 2000. The development of boundary selection criteria for the extension of breeding seabird special protection areas into the marine environment. BirdLife International/RSPB.

⁵Skov et al 1995. Important bird areas for seabirds in the North Sea including the Channel and the Kattegat. BLI, Cambridge

⁶Stone et al. 1995. An atlas of seabird distribution in north-west European waters. JNCC, Peterborough

⁷Stroud et al. 2001. The UK SPA network: its scope and content. JNCC, Peterborough

⁸Wernham et al. 2002. The Migration Atlas: movements of the birds of Britain and Ireland. T & A D Poyser, London



Assessing Marine Cumulative Effects in SEAs:

An Overview of Basic Principles

Aim of this brief

This brief aims to present a basic overview of cumulative effects assessment (CEA) as an integral part of Strategic Environmental Assessments (SEA) of marine plans and programmes (referred to jointly as 'plans' below). Most of the examples in this brief relate to cumulative effects on marine biodiversity. However, the basic principles presented here can be applied across all environmental topics.

What can the evaluation of cumulative effects offer to decision makers?

Cumulative effects cause some of the most serious issues that affect the marine environmental capital on which much of our economic and social activities are based. Many marine environmental problems, such as collapses in fish populations and loss of coastal habitats, result from the cumulative effects of human activities over time and space.

Cumulative effects assessment considers how key environmental receptors are affected by all plans and projects, rather than on the effects of a particular plan or project, within an area that may cross jurisdictional boundaries. Both strategic-level, and project-level, CEA of marine plans and programmes can help decision makers to avoid cumulative effects, and to minimise those that can not be avoided through better siting and phasing of development, and establishing development consent rules for projects.

What are cumulative effects?

Cumulative effects can be defined as:

'All effects on the environment which result from the impacts of a plan or project in combination with those overlapping effects from other past, existing and (reasonably foreseeable) future projects and activities' (Institute for Marine Resources and Ecosystem Studies, 2008)¹.

The term '**impact**' refers to the exposure of an environmental receptor to an activity/stress, while the term '**effect**' refers to changes to the environmental receptor resulting from the impact. For a more detailed definition of cumulative effects, see *Guidelines for Cumulative Effects Assessment in SEA of Plans* (Section 1)². Generally, cumulative effects can result from three types of activity patterns in the marine environment³:

1. Effects of **multiple instances of the same activity, resulting in the same impact** (e.g. multiple offshore wind farms in the same coastal area);
2. Effects of **more than one activity, resulting in the same type of impact** (e.g. accumulation of disturbance effects caused by offshore wind farms, shipping and exploration drilling); and

¹ Assessment of the cumulative effect of activities in the maritime area: overview of relevant legislation and proposal for a harmonised approach, Institute for Marine Resources and Ecosystem Studies (2008)

² Guidelines for Cumulative Effects Assessment in SEA of Plans, EPMG Occasional Paper 04/LMC/CEA, Imperial College London. (2004)

³ Assessment of the cumulative effect of activities in the maritime area: overview of relevant legislation and proposal for a harmonised approach, Institute for Marine Resources and Ecosystem Studies (2008)

3. Effects of **more than one activity, leading to multiple different impacts** (also known as effect interaction, e.g. accumulation of various effects caused by offshore wind farms, fishing, and coastal tourism, etc).

Cumulative effects can occur both **spatially** and **temporally**, be **positive** or **negative**, and result from **direct** or **indirect** impacts. These can follow different impact pathways and be:

- **Additive or in-combination**, see points 1 and 2 above (e.g. due to the additive or combined effect of individual effects: $a + a + a + a \dots =$ significant impact); or
- **Synergistic**, see point 3 above (e.g. stemming from reactions between effects that produce a total effect greater than the sum of its parts: $a + b + c + d \dots =$ significant impact).

The main explicit legal requirements for assessing cumulative effects in the EU are the SEA⁴, EIA⁵ and Habitats Directives⁶.

Why assess cumulative effects at a strategic level within an SEA?

Assessing potential cumulative effects at a strategic level within an SEA allows an overall understanding of the potential impacts of a plan, in combination with other plans, which could lead to cumulative effects. Early consideration of these effects, i.e. at the strategic level, enables decision makers to assess and select alternative solutions that will reduce and/or avoid cumulative effects, as well as implement effective mitigation or compensation measures, thereby avoiding delays that might otherwise arise at later stages in the development process. It is much more unlikely that alternative solutions will be effectively considered at the project level within an Environmental Impact Assessment (EIA) because of the limitations in scope at this stage.

However, strategic-level CEA will not remove the need to also consider cumulative effects at the project level. Assessment of the cumulative effects of plans and subsequent projects should be seen as a tiered approach, with each assessment stage ensuring that, on the information available to it, potentially significant cumulative effects are avoided or minimised. Where EIA is required for a project, the CEA/SEA of the relevant plan should help to speed and facilitate this subsequent assessment, by scoping and informing the main issues for consideration.

What are the main development issues affecting UK seas?

The main development issues affecting UK seas include offshore wind farm construction, wet renewables (e.g. tidal barrages, tidal stream, wave), cable and pipe laying, oil and gas exploration and exploitation, marine mineral dredging, shipping, recreation, coastal development and fisheries. Types of cumulative effects resulting from these drivers include:

- Species decline (e.g. due to removal, collision, barrier effects, displacement and loss of habitat and/or food);
- Habitat change and/or loss (e.g. direct loss of coastal and marine habitats which are built on or removed; indirect effects due to habitat change such as changes or loss of prey species); and
- Pollution (e.g. caused by oil spills, agricultural and urban run-off).

Cumulative effects in the marine environment: when do these become significant?

Cumulative effects tend to affect marine ecosystems' ability to function normally and/or their resilience to change by:

⁴ Directive 2001/42/EC on the 'assessment of the effects of certain plans and programmes on the environment' (the SEA Directive)

⁵ Directive 85/337/EEC on the 'assessment of the effects of certain public and private projects on the environment' as amended by Directive 97/11/EC (the EIA Directive)

⁶ Directive 92/43/EEC 'on the conservation of natural habitats and of wild flora and fauna' (the Habitats Directive)

- Reducing genetic diversity within species;
- Reducing the adaptability of species within an ecosystem; and
- Reducing the natural diversity and abundance of species/habitats/communities/ ecosystems, thereby upsetting the balance of the ecosystem.

If the ability to function or the resilience of marine ecosystems is eroded by cumulative effects to the point that damage occurs, a ‘critical threshold’ or ‘limit’ is reached, beyond which ecosystems begin to deteriorate. It is when these thresholds are likely to be breached, close to being breached, or breached, that cumulative effects become significant. Considering thresholds is central to assessing cumulative effects and their incremental effect on biodiversity. Currently, there is not much information available on critical thresholds in either the terrestrial or marine environments. However, it should still be possible to define qualitative environmental limits (e.g. in the form of SEA objectives) and precautionary limits against which the cumulative effects of the plan can be assessed (e.g. the EU fishing quota advice, which defines the precautionary levels that fishing mortality should not exceed).

Assessing cumulative effects in the marine environment

Some of the challenges inherent to assessing cumulative effects in the marine environment can be minimised by adopting a receptor-based approach to the assessment. Receptors can be defined in two main ways:

1. Spatially, e.g. a discreet area of estuarine mudflats or the biogeographic range of a population; and
2. By other characteristics, e.g. Pink-footed geese foraging outside the plan area but affected by the plan.

CEA is about estimating, quantitatively where possible, the cumulative effects of human activities on individual environmental receptors and on the environment as a whole. It may not be possible to define all cumulative effects in quantitative terms, and some effects may need to be described in subjective terms based on expert judgement.

Cumulative effects assessment for marine plans follows the same steps as CEA for land use plans. However, the scale of cumulative effects is usually larger and more complex in the marine environment than on land. The CEA principles outlined below are based on English Nature’s *Practical Toolkit for Assessing Cumulative Effects of Spatial Plans and Development Projects on Biodiversity in England*⁷, and the Institute for Marine Resources and Ecosystem Studies report on *Assessment of Cumulative Effect of Activities in the Maritime Area*⁸. As previously mentioned, CEA should be an integral part of an SEA or EIA, not a separate assessment (except in the context of scientific research or management plans).

See Table 1 below for an overview of CEA steps and how these can be applied to marine plans

Assessing the likely significant cumulative effects of the UK Offshore Energy Plan

Ideally, the cumulative effects assessment (CEA) for the UK Offshore Energy Plan should be based on population sensitivity analysis. However, we acknowledge the difficulties inherent in the assessment of cumulative effects and recognize that it will be difficult to carry out a full quantitative CEA due to data limitations. Despite this, it should still be possible to carry out a robust qualitative / semi-quantitative CEA. The CEA approach due to be developed under the auspices of the COWRIE birds sub-group may provide a suitable basis for developing the CEA methodology for this and/or future SEAs.

⁷ A practical toolkit for assessing cumulative effects of spatial plans and development projects on biodiversity in England, English Nature Research Reports, Number 673 (2006)

⁸ Assessment of the cumulative effect of activities in the maritime area: overview of relevant legislation and proposal for a harmonised approach, Institute for Marine Resources and Ecosystem Studies, report number C018/08 (2008)

The two main cumulative effects on birds that are likely to be significant and of concern are tern and gannet collision with rotors, and displacement of black scoter and red-throated diver. It is possible that in the future wind farms will be found along a sizeable portion of the migration route of red-throated divers and black scoters and cause transboundary cumulative effects. Currently, it is unknown whether there may be adverse effects on shearwaters, but the UK's special responsibility for breeding colonies makes them of potential concern. Also of concern are the combined cumulative effects presented in the Offshore Energy SEA of wind leasing, oil and gas exploration and gas storage on the marine environment, though there will also be interactions with other marine activities.

The scale of the Round 3 programme implies potential for significant cumulative effects both within and between the development zones proposed by the Crown Estate.

Guidance on Cumulative Effect Assessment

Guidance	Web link
Assessment of the cumulative effect of activities in the maritime area: overview of relevant legislation and proposal for a harmonised approach, Institute for Marine Resources and Ecosystem Studies, report number C018/08 (2008)	http://www.ospar.org/documents/07-08/icg-c/docs/0006_assessment%20of%20cumulative%20effects%2018-06-08.pdf
A practical toolkit for assessing cumulative effects of spatial plans and development projects on biodiversity in England, English Nature Research Reports, Number 673 (2006)	http://naturalengland.communisis.com/naturalenglandshop/docs/R673.pdf
A Practical Guide to the SEA Directive, ODPM (2005)	http://www.communities.gov.uk/documents/planningandbuilding/pdf/practicalguide%20sea.pdf
The practical implementation of marine spatial planning – understanding and addressing cumulative effects, English Nature Reports, Number 599. (2004)	http://naturalengland.communisis.com/naturalenglandshop/docs/R599.pdf
Guidelines for Cumulative Effects Assessment in SEA of Plans, EPMG Occasional Paper 04/LMC/CEA, Imperial College London. (2004)	http://www.environment-agency.gov.uk/aboutus/512398/1504325/1504417/831980/832006/

Annexes

- I. Non-exhaustive list of impacts and effects as presented in the Marine Strategy Directive (Annex II) including additional impacts (marked with an *⁹; and ** for those added by the RSPB)

⁹ Source: Assessment of the cumulative effect of activities in the maritime area: overview of relevant legislation and proposal for a harmonised approach, Institute for Marine Resources and Ecosystem Studies, report number C018/08 (2008)

Table 1: Cumulative effects assessment of marine plans and programmes: Basic principles

Note: All of the steps below are already part of an SEA process. Because of the complexity involved in mapping out the cumulative effects likely to result from within a marine plan, and from the interaction of that plan with other plans, it may be useful to consult experts when identifying ecological receptors, mapping pathways and identifying mitigation and monitoring methods.

SEA stage	CEA stage	Tasks, tools and suggestions for marine plans
Scoping	<p>A. Identify the types of cumulative affects that may arise.</p>	<p>Task: Identify the main types of cumulative effects likely to arise i) from the activities within the plan itself, and ii) in combination with past, current and future plans (for all activities).</p> <p>Tools: An essential part of CEA is analysis of causes and effect pathways (causes → pathways → effects). Causal Chain Analysis (also called Network Analysis) is a good way to illustrate cause-effect relationships between activities and receptors. Spatial analysis and expert opinion are also useful (e.g. GIS). Other tools include consultation and matrices (see page 37 of ‘A practical toolkit for assessing cumulative effects of spatial plans and development projects on biodiversity in England’ for a description of the advantages and disadvantages of different assessment tools).</p> <p>Marine Plans: A good way to identify cumulative effects and consider their likely i) spatial scale, ii) temporal scale, and iii) significance is to first identify the main marine environmental receptors that are likely to be under stress from a number of small and cumulatively significant changes. For example, a species foraging within the plan boundaries, or an important resource such as coastal habitats or water quality,</p>
	<p>B. Decide if an assessment of cumulative effects is required.</p>	<p>Task: If the preliminary cumulative effects identified are likely to be significant, these will need to be assessed. Significance is determined by the likelihood and magnitude of the effect.</p>
	<p>C. Identify the environmental receptors that are likely to be affected, as well as spatial and temporal boundaries.</p>	<p>Task: Describe the geographical extent of the area likely to be affected by the plan, and the receptors likely to be involved (main receptors will have been initially identified in Stage A).</p> <p>Marine Plans: Note that the spatial boundaries for CEA depend on several factors including; i) the type of plan, ii) the receptors being considered, iii) the cause-effect pathways through which the plan affects the receptors, and (iv) any effects the plan has outside its geographic boundaries. For example, a migratory bird species may require a larger area for assessment than a <i>Sabellaria</i> reef.</p>

SEA stage	CEA stage	Tasks, tools and suggestions for marine plans
<p>Predicting and evaluating the effects of the plan</p>	<p>D. Predict and assess the likely cumulative effects.</p>	<p>Task: Both the cumulative effects of the plan, <u>and its likely alternatives</u>, on receptors should be predicted and their significance assessed. This stage, in particular, should feed back into the refinement of the plan (i.e. influence decisions on siting, phasing of projects and/or setting development consent requirements/conditions and other mitigation measures).</p> <p>Commentaries describing the cumulative effects identified, and highlighting key issues and uncertainties, should accompany scored matrices. The conclusions of the CEA should be listed under a separate heading within the Environmental Report.</p> <p>Tools: These include matrices, carrying capacity analysis and threshold assessment, and modelling. However, in many cases, lack of information can limit quantitative assessment.</p> <p>Marine Plans: Predicting marine cumulative effects at a strategic level can be complex and uncertain. The precautionary principle should be applied when evaluating the risk of potential cumulative effects. For example, Ministers and the European Commission take into account scientific advice, which applies the precautionary principle, regarding the acceptable levels of fish mortality and use this advice to inform the setting of fishing quotas, which are usually precautionary levels.</p> <p>Note that the assessment will need to consider effects of activities that will start or last into the foreseeable future, and take a multisectoral view, i.e. consider effects of energy, fisheries, tourism plans etc.</p>
<p>Identifying mitigation measures</p>	<p>E. Identify ways of mitigating adverse cumulative effects and enhancing beneficial ones.</p>	<p>Task: All necessary measures to mitigate negative effects, and potential enhancement measures to maximise beneficial effects, should be considered. Any residual effects should be identified (i.e. effects that cannot be mitigated). This stage and the assessment stage above should feed into one another.</p>
<p>Monitoring significant environmental effects</p>	<p>F. Develop proposals for monitoring cumulative effects.</p>	<p>Task: Detail how the environmental performance of the plan or programme can be monitored.</p>

Annex 1: Non exhaustive list of impacts and effects as presented in the Marine Strategy Directive (Annex II), including additional effects (marked with an *; and ** for those added by the RSPB)

Impacts	Effects
Physical loss	<ul style="list-style-type: none"> • Smothering • Sealing
Physical damage	<ul style="list-style-type: none"> • Siltation • Abrasion • Selective extraction • * Non-selective extraction • ** Collision
Other physical disturbance	<ul style="list-style-type: none"> • Noise & ** vibration • Visual • Migration & ** movement barrier • Electromagnetic radiance • Water/tidal flow changes • Marine litter
Interference with hydrological processes	<ul style="list-style-type: none"> • Changes in thermal regime • Changes in salinity
Contamination by hazardous substances	<ul style="list-style-type: none"> • Introduction of synthetic compounds • Introduction of non-synthetic compounds • Introduction of radio nuclides
Nutrient and organic matter enrichment	<ul style="list-style-type: none"> • Nutrient enrichment • Organic enrichment • Changes in thermal regime • Changes in turbidity • Changes in salinity • * Changes in pH #
Biological disturbance	<ul style="list-style-type: none"> • Introduction of microbial pathogens • Introduction of non-indigenous species and translocations • Selective extraction of species, including bycatch • ** Collision
Other disturbances	<ul style="list-style-type: none"> • Visual • Changes in turbidity • Changes in pH #

Source: adapted from *Assessment of the cumulative effect of activities in the maritime area: overview of relevant legislation and proposal for a harmonised approach*, Institute for Marine Resources and Ecosystem Studies, report number C018/08 (2008)



Assessing Strategic Alternatives Using Causal Chain Analysis (CCA)

Introduction

This brief provides an overview of how causal chain analysis (CCA) could be used to assess alternative scenarios for high level plans in the context of Strategic Environmental Assessment (SEA).

At a strategic level, details are often lacking, making it difficult to assess alternatives. Causal chain analysis, also known as Network Analysis, provides an easy to understand, visual method of tracing the key consequences of strategic alternatives and identifying their environmental effects. It is a transparent approach that links causes and effects from source to receptor, and can be combined with other assessment tools, including spatial analysis and matrices.

Causal chains can be particularly useful in identifying¹:

- Cumulative effects
- The likely significance of effects
- Gaps in baseline information
- Areas where research is needed
- Mitigation measures needed to reduced negative effects and enhance positive ones
- Causal chains can also be used as a basis for generating discussion

The CLG *Practical Guide to the Strategic Environmental Assessment Directive*² suggests CCA as a possible methodology for SEA.

Strategic alternatives & the UK Offshore Energy Plan

We warmly welcome the receptor-based approach to the assessment of the UK Offshore Energy Plan as detailed in the scoping report. The 'Hierarchy of Options' procedure is also welcome as it provides some theory on how alternatives should be determined and assessed. However, the SEA process is so far missing out the second step of the 'Hierarchy' mentioned above; the consideration of alternative modes or processes, as illustrated by the initial alternatives identified. The following initial alternatives are considered in the scoping report for future offshore wind leasing, oil and gas licensing and gas storage:

1. Not to offer any areas for leasing/licensing.
2. To proceed with a leasing and licensing programme.
3. To restrict the areas offered for leasing and licensing temporally or spatially.

¹ Sheate W. & A. Kiely. Causal chain analysis: making the links. October 2007, Magazine of the IEMA

² <http://www.communities.gov.uk/publications/planningandbuilding/practicalguidesea>

The scoping report notes that these initial alternatives will be refined during the assessment process. In order to cover a range of reasonable alternatives (as required by the SEA Directive), this refinement process should involve developing a set of strategic alternatives for wind leasing, oil and gas licensing and gas storage, individually.

The scoping report notes that **activity scenarios**, detailing a credible range of activities, will be developed and used as the basis for the assessment (i.e. will be evaluated against the SEA objectives in receptor-based matrices). Assessment of strategic alternatives through causal chains analysis could complement and inform the assessment of the more detailed activity scenarios (see the Wales Rural Development Plan SEA which developed 26 causal chains to inform the assessment of the plan³).

Assessing strategic alternatives using causal chains

Overleaf is an example of a causal chain outlining the likely primary and secondary effects of a potential UK Offshore Energy Plan wind leasing scenario on key ecological receptors. In this theoretical scenario which we developed for illustrative purposes, 40% of the 25GW target is concentrated on the UK's East coast, with 10-20% located in the Irish Sea, and the rest distributed in the South West, North Wales coast, South Wales and Greater Bristol Channel. The causal chain includes suggestions for possible mitigation measures, as well as comments on data gaps and the implications of some of the effects identified. This example is only moderately detailed to illustrate the process but could be further developed, e.g. the significance of the effects identified could be evaluated.

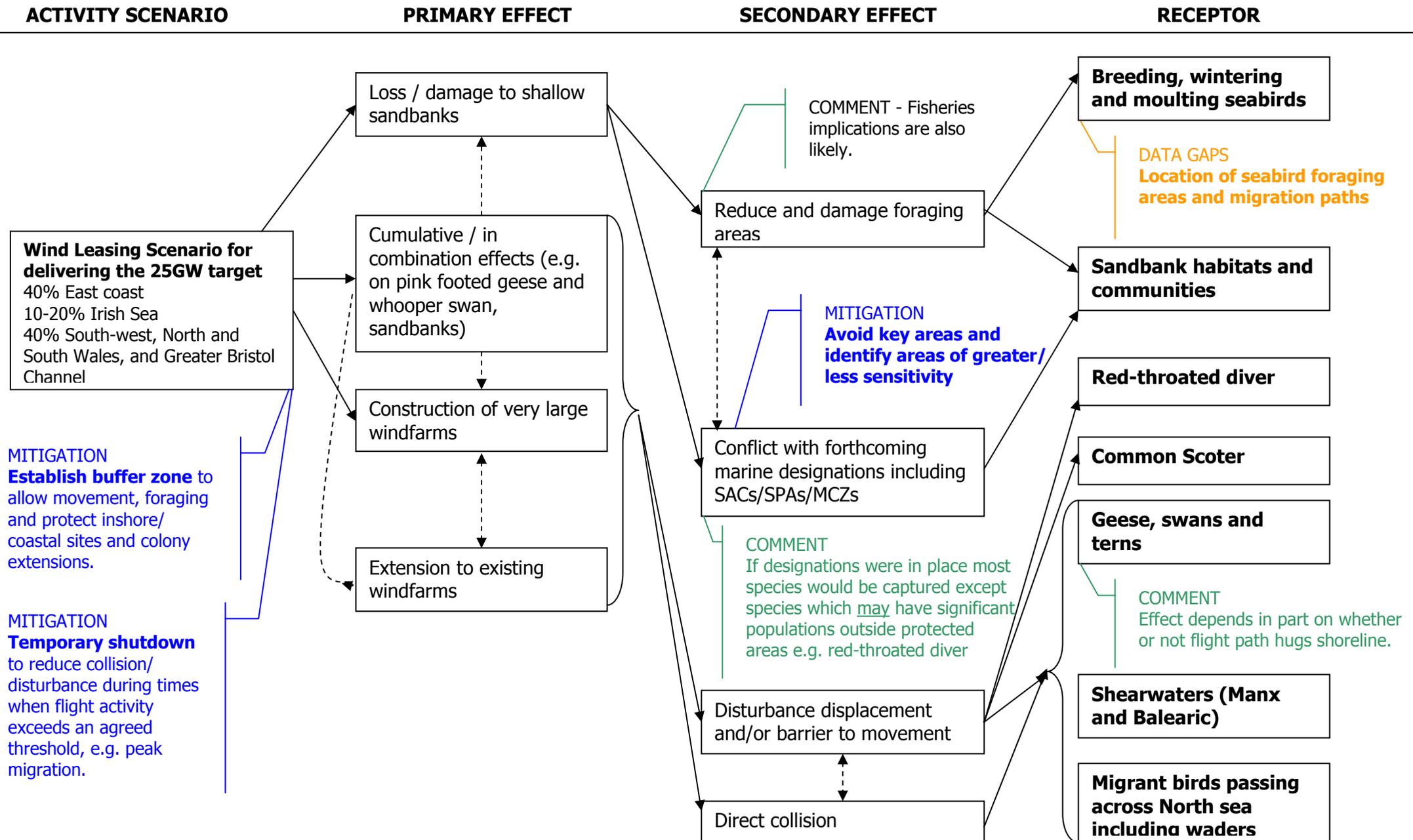
Other potential strategic alternatives for wind leasing include:

- Concentrating 80% of the UK Offshore Energy Plan 25GW target along the East coast (Greater Wash to Dogger banks), with 20% in the Irish Sea.
- Concentrating the 25GW target in the areas identified by the Crown Estate during the launch of round 3 of offshore windfarm leasing.
- More generic alternative scenarios including a) numerous smaller vs. fewer larger offshore wind farms, and b) a greater number of nearshore vs. offshore sites

We have not covered strategic alternatives for oil and gas licensing and gas storage in this brief. However, these scenarios could also be developed and assessed at a strategic level using causal chains.

³<http://wales.gov.uk/topics/environmentcountryside/farmingandcountryside/ruraldevelopment/20072013ruraldevelopmentplan/?lang=en>

Causal chain of the likely primary and secondary effects of a wind leasing scenario on key ecological receptors.





OFFSHORE ENERGY SEA ENVIRONMENTAL REPORT

THE WILDLIFE TRUSTS' RESPONSE TO THE CONSULTATION

22nd April 09



**The Wildlife Trusts
The Kiln, Waterside, Mather Road, Newark, NG24 1WT
Registered Charity No. 207238**



INTRODUCTION

1. There are 47 local Wildlife Trusts across the whole of the UK, the Isle of Man and Alderney. We are working for an environment rich in wildlife for everyone.
2. With 765,000 members, we are the largest UK voluntary organisation dedicated to conserving the full range of the UK's habitats and species whether they be in the countryside, in cities or at sea. 135,000 of our members belong to our junior branch, Wildlife Watch and our expert staff are aided by a formidable workforce of more than 39,000 volunteers.
3. We manage 2,200 nature reserves covering more than 80,000 hectares, including over 200 coastal and marine reserves; we stand up for wildlife; we inspire people about the natural world and we foster sustainable living.
4. The Wildlife Trusts have been campaigning for many years for comprehensive legislation to achieve better protection for marine wildlife and effective management of our seas.
5. The UK's marine environment is extraordinarily rich in wildlife, harbouring many thousands of animal and plant species. But these species, and their habitats, are poorly protected compared to terrestrial wildlife, and under increasing pressure as marine activities proliferate and climate change disturbs the marine ecosystem. We welcome the opportunity to respond to the Offshore Energy Strategic Environmental Assessment (SEA) Environmental Report, and provide a number of points detailed below.

OVER-ARCHING COMMENTS ON THE CONSULTATION

1. We wish to congratulate the Department of Energy and Climate Change (DECC) and their consultants on producing a very thorough and comprehensive review of the available environmental data and information. It is clear that a huge amount of work has been undertaken in producing this environmental report and we are sure that the data acquired will be of use beyond the scope of this strategic environmental assessment.
2. The Wildlife Trusts support the UK's targets to reduce greenhouse gas emissions and the Government's ambitions to tackle climate change and increase the proportion of overall energy generated from renewable sources. We share the sense of urgency in deploying and developing solutions to move the UK towards a low carbon society.
3. We believe securing widespread public support for the transition to a low carbon economy is critical. This will be helped considerably if large-scale renewable projects are seen to respect the natural and cultural environment.
4. Offshore wind energy is essential part of moving to a zero carbon power sector. We therefore support the exploration of suitable sites in order to harness the considerable power resource of the wind, to contribute to emissions reductions beyond 2020.
5. We also believe that there should be a willingness from government to put in place the radical policies needed on energy demand, greater decentralised supply and technology



innovation in order to meet government's targets to reduce greenhouse gas emissions by 80% by 2050.

6. Whilst we acknowledge that the SEA considers hydrocarbon gas storage in order to increase the UK's storage capacity and maintain resilience of gas supply in cold weather periods of high demand or interruptions to imported supplies, it is not clear what monitoring and controls will be essential to assessing the potential effects of storing hydrocarbon gases. We would welcome clarification of the safeguards in place.

What are the alternatives to the draft plan/programme?

- (1) Not to offer any areas for leasing/licensing
- (2) To proceed with a leasing and licensing programme
- (3) To restrict the areas offered for leasing and licensing temporally or spatially

The Wildlife Trusts support the conclusion of the environmental report which recommends that alternative (3) to the draft plan/programme is the preferred option, with the area offered restricted spatially through the exclusion of certain areas. We welcome that a number of mitigation measures to prevent, reduce and offset significant adverse impacts on the environment and other users of the sea will be implemented.

ENVIRONMENTAL REPORT

Biodiversity, habitats, flora and fauna

1. We acknowledge that given the lack of definition of the actual survey and development programmes which the draft plan/programme may entail (in terms of duration, nature of acoustic sources and the potential for temporal or spatial mitigation during construction, operation and decommissioning), it is also not possible to make specific recommendations concerning mitigation. However, we welcome that as such, project-specific assessments will be required for all areas under the existing regulatory regime, including requirements for consideration of deliberate disturbance of cetaceans.
2. In key areas of marine mammal sensitivity, where operational criteria are to be established to limit the cumulative pulse noise "dose" (resulting from seismic survey and pile-driving), in addition to the development of mitigation methodology and communication between DECC, JNCC and the future MMO, guidance should also be frequently re-visited in order to take into consideration the latest scientific findings, as significant adverse effects are likely without mitigation.
3. The Wildlife Trusts welcome the fact that given the relative sensitivity of multiple receptors in coastal waters, that new generation capacity should be sited well away from the coast, generally outside 12 nautical miles (some 22km).
4. Although in certain cases new offshore wind farm projects may be acceptable closer to the coast, we welcome the precautionary approach that considers that buffer zones may be required in excess of 12 nautical miles.



5. Where wind farms are to be considered closer to shore, careful and detailed consultation should be undertaken to ensure that any impacts are minimised. Of course, in any development, whether nearshore or offshore, connection to the grid still plays a major part and could impact upon sensitive marine sites through cable laying. This element of development should be adequately considered in all applications for licensing, with suitable spatial restrictions as required.
6. We are pleased that data gaps in our knowledge and understanding have been recognised, and that there is recognition that developers will need to be aware that adequate data is a prerequisite to effective environmental management of activities.
7. As our scientific knowledge and understanding increases, the latest information should be considered in all development proposals to enable the best available information to be utilised at the time. Efforts should also be made to fill data gaps where necessary.

Other users, material assets (infrastructure, other natural resources)

8. *The range and importance of existing and some potential uses of the sea are described in Appendix 3 of the Environmental Report, with key aspects summarised. In advance of formal marine spatial planning, the approach taken in this SEA has been to obtain accurate and recent information on other current and likely uses of the sea in the foreseeable future, to facilitate identification of sensitive areas and measures to reduce the scope and scale of significant adverse effects.*
9. It will be important however, to apply the principles of marine spatial planning, as outlined in the Marine and Coastal Access Bill to any future plans or projects to ensure that all potential uses and cumulative impacts are considered.

Interrelationships - Cumulative effects

10. Although the effects of multiple noise sources is an area acknowledged as requiring better understanding, there is no information provided as to how this major data gap, or others (as discussed above) will be filled. It is of crucial importance in marine planning and licensing that cumulative impacts are considered as licensing applications come to the table. Only by taking a holistic approach can we safeguard against damage to the marine environment.

Interrelationships - Wider policy objectives

11. *Efforts are (or will be) underway to identify offshore Marine Conservation Zones/Marine Protected Areas e.g. under the Marine Strategy Framework Directive, OSPAR and the Marine and Coastal Access Bill. Where the objectives of the conservation sites and renewable energy development are coincident, preference should be given to locating wind farms in such areas to reduce the potential spatial conflict with other users.*
12. We seek clarification on the above statement as it can be read a number of ways, i.e. that development should not occur in Marine Conservation Zones (MCZs)/Marine Protected Areas (MPAs); that where objectives are coincidental that developments should be given precedent; that developments should be put inside MCZs where their objectives are compatible.



13. We wholly support the “Government commitment to build an ecologically coherent network of MPAs” as published in the *Consultation on Delivering Marine Conservation Zones and European Marine Sites: A draft strategy for marine protected areas*, published on the 21st April 2009.
14. We recognise that sites such as offshore wind farms, once installed and working could provide benefits for marine conservation. For example, through the exclusion of mobile fishing gear.
15. As such offshore wind farms may have a place in an ecologically coherent network, but attempts to find mutual benefit must not undermine the achievement of an ecologically coherent network. The network is paramount and should be the foremost consideration.

Conclusion

1. Given the huge spatial scale of the Environmental Report and the level of data required to conduct a full and proper assessment of offshore wind, oil & gas exploration and hydrocarbon exploration we congratulate DECC on the production of this report.
2. We urge data gaps to be filled where necessary and cumulative impacts to be assessed through detailed assessment and marine spatial planning analysis.
3. We seek clarification concerning the siting of offshore wind farms in respect to the ecologically coherent network of MPAs, to which the Government is committed to achieving. Whilst there may be a role for sites within the network, development of network is paramount and designation of MPAs should be first and foremost.
4. In order to achieve the UK’s ambitious targets to tackle climate change, reduce emissions and develop renewable technology without negatively impacting upon the marine environment we have to ensure that the right technology is in the right place.
5. We are moving into a new era for energy production. If we are going to proceed with development on this scale and, in the marine environment, we must ensure we get it right, both for people and wildlife.



Offshore Energy SEA Consultation
The Department of Energy and Climate Change
4th Floor Atholl House
86-88 Guild Street
Aberdeen AB11 6AR
Fax: 01224 254019

WDCS Head Office
Brookfield House
38 St Paul Street
Chippenham SN15 1LY
UK
Phone 44 (0) 1249 449500
Fax 44 (0) 1249 449501

www.wdcs.org

20th April 2009

WDCS' response to the UK Offshore Energy Strategic Environmental Assessment.

The Whale and Dolphin Conservation Society (WDCS) welcome the production of the SEA, and regard robust spatial planning as important for marine protection.

We welcome the conclusion that areas of importance to cetaceans should be avoided for offshore wind developments. This statement should also be clearly applied to oil and gas developments.

We are concerned however that no such areas are specifically identified. It is acknowledged that the information on distribution of cetaceans is lacking. This is particularly true for offshore areas where wind farms, and many oil and gas developments are proposed. The Appropriate Assessment for oil licensing in Cardigan Bay, Wales, concluded there was insufficient information to allow licensing. This is still the case and is likely to remain this way, as all government/statutory agency funding for dolphin survey in the Bay has been cut – this area therefore should continue to be identified as an area where licensing is not appropriate.

Likewise, as the Moray Firth in Scotland is currently under special consideration by DECC before future seismic occurs, we consider that further licensing would be inappropriate here. Further, given that this SEA considers oil and gas as well as renewables, DECC should consider possible wind developments in the outer Moray Firth in its current discussions and research plans within the Moray Firth.

The SEA should clearly have shown areas that are considered important to cetaceans which are not to have developments; areas where there is currently insufficient information to make a decision at this stage, and so should be avoided on a precautionary basis; and areas where there is sufficient information to propose development pending the outcome of a full Environmental Impact Assessment.

To date, the only areas that have been out of bounds are those designated as Special Areas of Conservation (SACs). As has been stated many times in previous SEA comments, this is clearly inappropriate in that SAC designation is only applicable for two of the UK's 24+ species of whales, dolphins and porpoises. Those species that are endangered, such as the fin and blue whales, are currently afforded no protection despite residing in offshore UK waters that coincide with oil and gas

exploration and development year round. We also note that all cetaceans are meant to be protected under EU law (see below).

There is an over reliance on the SCANS surveys to provide information on cetacean distribution. These were broad transect surveys and not designed to give site specific information. Many areas of importance for cetaceans, such as Cardigan Bay, were not covered in these surveys. We would like to have seen a specific commitment to a programme of cetacean surveys, similar to the programme of bird surveys currently underway. Compiling information about species distribution and abundance does not go far enough. Tangible efforts to investigate impacts, and where impacts are known, protect populations are required.

Therefore, WDCS favour alternative 3 to the draft plan/programme for future offshore wind leasing, oil and gas licensing and gas storage:

3. To restrict the areas offered for leasing and licensing temporally or spatially.

We are very concerned that the SEA considers that the issue of noise can be dealt with through the Appropriate Assessment process. To begin with, this process is only applicable for SACs. There are only two SACs specifically for cetaceans, and then only for one species, the bottlenose dolphin. All cetaceans are required to have Strict Protection under Article 12 of the EU Habitats Directive and the effects of noise on all species need to be considered very carefully. The Appropriate Assessment is therefore not applicable to most species and most locations, and we do not believe the project based Environmental Assessment has been applied robustly enough to assess important issues such as effects on noise where there is considerable uncertainty. Two studies have shown that a significant proportion of Environmental Statements are inadequate.

WDCS consider that there should be a lot more work on the zone of influence of noise, particularly given recent work demonstrating the limited effectiveness of broad mitigation methods for the protection of cetaceans from intense noise pollution (for example, Dolman et al., 2009; Parsons et al., 2008, 2009). There should be a suitable buffer around areas identified as important for cetaceans which should be treated the same way as protected areas. There should also be consideration of noise effects on animals from protected areas that spend part of their time in different areas. For example, dolphins from within the Cardigan Bay SAC have been identified around the North Wales Coast – close to a wind farm development area. The potential for impact on cetaceans in all waters need to be considered and not continue with an over reliance on the woefully inadequate protected areas. Similarly the animals protected within the Moray Firth SAC are found roaming down the northeast coast of Scotland and into English waters around Newcastle. Yet, the cumulative impacts of developments and activities relating to oil and gas development, marine wind developments, coastal harbour developments and expansions are not considered.

The entire series of SEAs for oil and gas developments have highlighted the lack of information on cetacean distribution, important areas of habitat for cetaceans, actual impacts of many developments and the actual status of most cetacean populations. Until further work is carried out on these issues, the SEAs will continue to fail to adequately address cetacean conservation needs and the UK government is therefore not fulfilling its obligation for strict protection of cetaceans.

WDCS praise the research conducted under the SEA process on vocalisations of large baleen whales in the Atlantic Frontier. We know that fin whales are vulnerable to noise impacts (Borsani et al., 2007; Clark & Gagnon, 2006) so it is imperative that the full analysis is conducted and informs decisions without delay. Fin whales are an endangered species and yet they, along with all our other large baleen

whale and offshore species, are currently given no tangible consideration in decisions surrounding licensing of oil and gas, or any other decisions made.

References:

Borsani, J.F., Clark, C.W., Nani, B., Scarpiniti, M. 2007. Fin whales avoid loud rhythmic low-frequency sounds in the Ligurian Sea. Poster presented at the International Conference on the Effects of Noise on Aquatic Life, Nyborg, Denmark, August 13-17, 2007.

Clark, C.W., Gagnon, G.C., 2006. Considering the temporal and spatial scales of noise exposures from seismic surveys on baleen whales. In: Paper Presented to the Scientific Committee at the 58th Meeting of the International Whaling Commission, 26 May–6 June 2006, St. Kitts, SC58/E9.

Dolman, S. J., Weir, C. R., Michael Jasny, M. 2009. Comparative review of marine mammal guidance implemented during naval exercises. *Marine Pollution Bulletin*. 58: 465–477.

Parsons, E.C.M., Dolman, S.J., Wright, A.J., Rose, N.A., Burns, W.C.G. 2008. Navy sonar and cetaceans: Just how much does the gun need to smoke before we act? *Marine Pollution Bulletin* 56, 1248–1257.

Parsons, E.C.M., Dolman, S.J., Jasny, M., Rose, N.A., Simmonds, M.P., Wright, A.J. 2009. A critique of the UK's JNCC Seismic Survey Guidelines for minimising acoustic disturbance to marine mammals: best practise? *Marine Pollution Bulletin*. (in press).



WWF *for a living planet*

WWF-UK
Panda House, Weyside Park
Godalming, Surrey, GU7 1XR
tel: +44 (0)1483 426333
fax: +44 (0)1483 426409
info@wwf.org.uk
wwf.org.uk

WWF-UK Response to 'Future Leasing for Offshore Wind Farms and Licensing for Offshore Oil & Gas and Gas Storage: Environmental Report'

WWF-UK welcomes the opportunity to respond to the consultation on the Environmental Report released by the Department of Energy and Climate Change (DECC) outlining the outcomes of the Strategic Environmental Assessment (SEA) of the draft plan/programme for future leasing for offshore wind farms and licensing for offshore oil and gas and gas storage. WWF-UK has been involved in commenting on previous rounds of offshore leasing and licensing and we currently have a seat on the SEA Steering Group as a stakeholder, which we have not utilised over the past year. WWF-UK has concerns about the failure of previous SEAs, specifically related to offshore oil and gas licensing, to properly deal with climatic factors and bottlenose dolphins in SACs. WWF appreciates the opportunity to provide input into this process and encourage DECC to continue improving their approach in seeking the highest level of protection of the marine environment required when undertaking offshore energy development.

SUMMARY

WWF-UK welcomes the acceptance of the likely impact of this plan/program on climatic factors, notably climate change and the identification of many potential impacts from climate change on people and nature. However, WWF-UK finds that the SEA fails to properly assess the impacts on the environment and people, as well as the scale, importance, significance and reversibility of potential impacts. The SEA also fails to offer methods to reduce such impacts or mitigate/offset them, as required by the SEA Directive¹. For these reasons, we believe that the SEA is inadequate and fails to fulfil the requirements of the SEA Directive.

WWF-UK strongly urges DECC to withhold from licensing for oil and gas in and adjacent to the bottlenose dolphin SACs in Wales and Scotland. It has already been concluded in an Appropriate Assessment that the Cardigan Bay SAC should not have oil and gas licensing and this should be adopted in this SEA also. We also expect that other areas withheld from licensing in previous SEAs should also be removed from consideration in this plan.

WWF-UK is greatly concerned that this SEA displays several biases toward favouring the development of oil and gas over and above offshore wind energy developments and gives examples of this. We recommend that DECC revise the draft SEA to redress this imbalance.

Consequently, WWF-UK finds that parts of the SEA need to be redrafted and offers suggestions of how SEAs should address climate change impacts to achieve compliance with the SEA Directive.

¹ Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment



President: HRH Princess Alexandra,
the Hon Lady Ogilvy KG, GCVO
Chair: Ed Smith
Chief Executive: David Nussbaum

WWF-UK charity registered in England number
1081247 and in Scotland number SC039593
and a company limited by guarantee registered
in England number 4016725.
VAT number 733 761821
Printed on recycled paper

Scope of SEA

WWF-UK is pleased to see that the SEA Environmental Report has succeeded in collating and analysing a vast amount of environmental and socio-economic information. We welcome the receptor based assessment, the precautionary approach adopted on many fronts and the incorporation of SEA Steering Group and COWRIE contributions. We are encouraged to see that the approach adopted has improved progressively over completion of SEAs 1 – 8.

In commenting on previous SEAs, WWF-UK submitted that the scope of the SEAs were too narrowly focused on oil and gas licensing and we advocated a shift to expand consideration of environmental assessment in a truly strategic way. We recommended that the UK's 2007 Energy White Paper and subsequent energy policy should be subject to SEA, as this was a more appropriate level at which to conduct an SEA that is truly strategic. We still consider that it is appropriate to fully utilise the SEA tool at a level where strategic considerations would be most beneficial to environmental protection – at the wider energy level. However, this has not been done as there was no SEA undertaken for the Energy White Paper and the government continue to insist that SEA is not required to be undertaken for high level policy. We consider that it is critical that the current and any future SEA processes are undertaken in full compliance with the SEA Directive and take on board the full range of secondary and cumulative climate change impacts.

In previous work on SEAs, WWF-UK felt that there was not sufficient strategic coordination between the various government departments in respect of harmonising the SEA process to include strategic assessment of both oil and gas and renewables. We are pleased to see that the latest SEA does now include assessment of oil and gas licensing *and* offshore wind leasing. WWF-UK submits that opportunities should be sought to substitute hydrocarbon development for renewables, both geographically and in energy composition replacement due to the lesser environmental impacts from renewables.

WWF-UK reiterates its concerns that there is a sense that marine renewables are considered as if they are in direct competition for seabed space with oil and gas. If the UK is truly moving towards a low carbon economy and seeking to meet its UK carbon emission reduction targets and EU renewable energy targets, then there must be *no* competition and the government must seek to maximise the potential for marine based renewables. We strongly suggest that if an area of seabed is considered suitable for both renewables and hydrocarbons, renewables must be given priority access. In support of this, effective marine spatial planning should be carried out taking account of climate change impacts from developments and with an ecosystem based approach which includes the climate as part of the marine ecosystem.

WWF-UK notes that there are currently a number of other SEAs being conducted for plans/programmes being considered by the Government, including within the appraisal of sustainability for energy National Policy Statements and the SEA for the Severn Tidal Power project. We seek confirmation from DECC that all these SEA processes will be consistent and linked in a coordinated way to ensure that the objectives of each plan/programme can be achieved in a complementary manner without increased potential for environmental impact.

WWF-UK also notes that the current SEA and draft plan/programme do not include the territorial waters of Scotland and Northern Ireland. Whilst we recognise that the reason is because these are devolved powers, we express concerns with any necessary alignment of strategic considerations across all regions.

WWF-UK is unclear as to why Carbon Capture and Storage is not covered better in this SEA and would like to see the SEA consider this. We note that the SEA is stated to cover gas storage. However, it is not made clear whether this is to include storage of both natural gas and CO₂. As a result, it is also not clear whether the impacts identified and assessed are relevant in respect of storage of natural gas and/or CO₂. WWF-UK requests clarification of this point in order to determine if the SEA has sufficiently addressed impacts related to gas storage.

Objectives and Reasonable Alternatives

The SEA Environmental Report defines the main objectives of the current plan/programme as:

“to enhance the UK economy, contribute to the achievement of carbon emission reductions and security of energy supply, but without compromising biodiversity and ecosystem function, the interests of nature and heritage conservation, human health, or material assets and other users”².

WWF-UK notes that this objective differs from the objectives of previous SEAs in that a broader context is applied and the objectives are not limited to the exploration and appraisal of oil and gas resources. However, the overall context and objectives are clearly focused on what DECC considers to be the main challenges - tackling climate change by reducing carbon emissions and ensuring secure, clean and affordable energy. An important omission from the context and objectives of the SEA is to ensure the protection of the marine environment. This is not quite the same as saying *“without compromising biodiversity and ecosystem function...”*. WWF-UK suggests that a more balanced context should be applied to include mention of the wealth, value and diversity of the marine environment in addition to justifications on economic contribution from activities.

Given the broad nature of the stated objectives of the draft plan/programme, WWF-UK queries how the reasonable alternatives have been limited to three:

1. not to proceed with any areas for leasing/licensing - the “do nothing” option;
2. to proceed with a leasing and licensing programme – the “business as usual” option;
3. to restrict the areas offered for leasing and licensing temporally or spatially.

We question whether the third alternative is in fact an alternative in its own right or merely a variation of the second alternative. Ultimately, the alternatives are to proceed with the plan/programme or not to proceed. The third alternative appears to be an option intended to cover the whole range of possible variations within the extremes of alternatives 1 and 2.

As we have stated in the past, WWF-UK considers that this range of alternatives does not allow for adequate assessment of viable options to the draft plan/programme. Other possible measures that could enhance the UK’s economy, assist in achieving carbon emission reductions and provide security of energy supply have not been considered. For example, there is no mention of measures such as increasing energy efficiency and reducing energy demand.

Rather, the context described in relation to offshore oil and gas licensing is that:

“fossil fuels will continue to be the predominant source of energy for decades to come.... Making efficient use of the UK’s own energy reserves brings obvious benefits both in the contribution it can make to a diverse UK energy mix and to the economy in terms of jobs, investment and national income generated by the sector”³.

The Report goes on to quote the 2007 HM Treasury discussion on the Energy White Paper, which states that the *“UK Government remains committed to promoting a healthy and prosperous UK oil and gas industry and maximising the economic recovery of the UK’s oil and gas reserves”*. WWF-UK is concerned that comments such as these evidence a favouritism towards exploitation of oil and gas resources over and above other sources of energy or a package of measures which could be used to meet the challenges of climate change and energy security.

² page i of the Non-technical Summary

³ Page ii of the Non-technical Summary

WWF's Climate Solutions research⁴ describes WWF's Vision for 2050 and shows that the world has more than enough sustainable energy and technology to curb climate change, but key decisions need to be made now. A clear role for renewable energy is envisaged in the context of a broader range of necessary solutions:

- Reducing energy demand through energy efficiency and conservation – the top priority;
- stopping forest loss;
- accelerating the development of low-emissions technologies such as wind, hydro, solar PV and thermal, and sustainably produced bio-energy;
- developing flexible fuels, energy storage and new infrastructure;
- replacing high-carbon coal with low-carbon gas; and
- equipping fossil-fuel plants with carbon capture and storage technology.

WWF-UK would like to remind government of the important **findings from analysis by Pöyry in 2008** which we commissioned earlier this year jointly with Greenpeace in order to look at the implications for the UK electricity sector of meeting the UK's share of the EU renewable energy target⁵.

The report was based on the assumption (supported by government analysis) that there was around 76GW of connected capacity in 2007. Of this, 22.5GW is expected to close by 2020. Pöyry consultants constructed various scenarios of energy demand and renewable energy growth to ascertain whether these technologies would be able to meet the so-called 'energy gap'. Key findings of the Pöyry analysis are:

- if the government meets its own energy efficiency and renewable targets, new baseload electricity generation capacity will not be needed until the period beyond 2020. By this point other low carbon technologies will be close to commercialisation;
- the combination of renewable energy generation and energy efficiency results in up to 42% reduction in gas use, thereby reducing UK dependency on gas imports and strengthening energy security;
- in the scenarios developed, the UK's carbon dioxide (CO₂) emissions are reduced by up to 37% (from 1990 levels) by 2020.

This analysis shows that in contrast to the views of government and industry, there is no need to build new fossil-fuelled power generation to keep the lights on in the UK. Instead, the focus should be on delivering existing targets and commitments for energy efficiency and renewable energy. Further, we must push for development and commercial deployment of innovative, low carbon technologies which have less environmental impact as a priority.

The government's top priorities must, therefore, be to lead a strong drive for energy efficiency and create the best conditions for a transformative expansion in sustainable, low-impact renewable energy production capacity. WWF-UK believes that government policy must deliver on the new UK energy efficiency and renewable energy targets from the EU, because in doing so, it will help ensure that the key objectives on energy security, energy independence and climate change mitigation are achieved. While there may be some significant costs involved initially, an efficient energy system powered by renewables will be less exposed to shocks in fossil fuel prices – and the shift to such a low carbon economy can be expected to yield huge benefits in terms of job creation and new opportunities for British businesses. As repeated and advocated by Lord Stern this week (21st April, 2009)⁶ in his article, '*Enough green talk. Now*

⁴ WWF-UK (2007), Climate Solutions report: <http://assets.panda.org/downloads/climatesolutionweb.pdf>

⁵ 'Implications of the UK meeting its 2020 renewable energy target: A Report to WWF-UK and Greenpeace UK' (August 2008) http://assets.wwf.org.uk/downloads/poyry_2020renewabletarget.pdf

⁶ http://www.timesonline.co.uk/tol/comment/columnists/guest_contributors/article6135687.ece

make it happen' released a day ahead of the UK's budget announcements and in which he states the following;

"The third runway go-ahead throws doubt on the Government's eco-credentials. This Budget could put it back on track. Tomorrow's Budget is a critical test of the consistency and credibility of the Government's policies on climate change. The Government has accepted the overwhelming arguments for reducing our emissions of greenhouse gases by at least 80 per cent, compared with 1990, in the next 40 years".

In light of the above, and if the stated challenges to be met and the objectives of the draft plan/programme are considered, the range of alternative solutions offered within the SEA are not sufficient. SEA is intended to be a strategic level assessment that should inform the development of the plan/programme and the identification, description and evaluation of reasonable alternatives (see Article 1, Article 5(1) and Annex 1(h)). The SEA Directive requires consideration of 'reasonable alternatives', taking into account the plan's objectives and geographical scope. The EU Guidance⁷ considers the requirements in relation to alternatives at paragraphs 5.11 – 5.14. Paragraph 5.11 states:

"The obligation to identify, describe and evaluate reasonable alternatives must be read in the context of the objective of the Directive which is to ensure that the effects of implementing plans and programmes are taken into account during their preparation and before their adoption."

In paragraph 5.12 it goes on:

"...The essential thing is that the likely significant effects of the plan or programme and the alternatives are identified, described and evaluated in a comparable way. The requirements in Article 5(2) concerning the scope and level of detail for the information in the report apply to the assessment of alternatives as well. It is essential that the authority or Parliament responsible for the adoption of the plan or programme as well as the authorities and the public consulted, are presented with an accurate picture of what reasonable alternatives there are and why they are not considered to be the best option."

Paragraph 5.13 states:

"...The first consideration in deciding on possible reasonable alternatives should be to take into account the objectives and the geographical scope of the plan or programme.... An alternative can thus be a different way of fulfilling the objectives of the plan or programme..."

Taking into account this guidance, WWF-UK considers it important to ensure that the options are not artificially limited at the outset and that potential reasonable alternatives should not be discounted prior to the SEA process being completed. There is now clear policy acceptance (through the adoption of the SEA requirements at UK level) of an iterative approach to selecting major project options. The whole structure of decision making now presupposes that a decision maker does not start with a particular option and try to justify it, but rather starts with plan/programme objectives and then through an iterative process assesses how best to deliver those plan/programme objectives in the light of environmental considerations.

WWF-UK again calls for a fundamental change in the approach used in identifying reasonable alternatives for the purpose of SEA to ensure that the assessment of alternatives is not skewed due to the restricted nature of the alternatives chosen.

⁷ Commission's Guidance on the Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment

Other Context to the Draft Plan/Programme

WWF-UK was pleased to see the Marine Bill White Paper (2007) and the Marine and Coastal Access Bill mentioned within the Environmental Report as initiatives which have been analysed in terms of their implications for the draft plan/programme and vice versa. However, we query whether the objectives of the White Paper and Bill have been properly considered in the context of the SEA, given that oil and gas licensing has been specifically excluded from the remit of the Marine Management Organisation (MMO) and any form of regulation under the Bill.

Over the last year or so, we have seen the introduction of the Planning Act 2008, the Climate Change Act 2008 and now the Marine and Coastal Access Bill. In combination, this new package of statutory regulation is intended to ensure that both marine and terrestrial spatial planning systems are integrated and consistent for the purpose of streamlining processes to enable rapid deployment of renewables and supporting the Government's commitments to decarbonising the energy sector and shifting towards a low carbon economy, at the same time protecting marine biodiversity and the environment.

Offshore wind farms are included in this new regime, with the generating capacity of the wind farm determining whether it is within the remit of the MMO or the Infrastructure Planning Commission. To ensure proper planning of renewables in the marine environment, WWF-UK is calling for the MMO to be made a statutory adviser to the IPC and for the IPC to be required to seek and take into account recommendations made by the MMO. However, oil and gas licensing continue to be separate from this new regime. When WWF-UK has queried this, the response has been that oil and gas licensing has an established system in place for SEA and implementation of the plan/programme and this system works.

WWF-UK is disappointed that such a specific exclusion has been applied to ensure that oil and gas licensing continues to be treated differently, and perhaps more favourably, than other major infrastructure projects within the marine environment or with the potential to impact on the marine environment. We consider this is a serious omission and mistake by the Government because it is the burning of the petroleum (and coal) industries' extracted products (fossil fuels) by humans that are responsible for the climate change threats we now face, not to mention other devastating pollution such as oil spills and gas flaring. We request serious consideration to be given to why oil and gas licensing should have its own regulatory regime in light of the recent legislative changes that were intended to simplify, improve and properly manage decision making processes and establish decision making bodies with the necessary expertise to properly balance all interests.

Given that the position in respect of licensing of oil and gas exploration is unlikely to change, WWF-UK welcomes the Government's commitment to marine spatial planning and a network of marine protected areas through the Marine and Coastal Access Bill and we encourage DECC to take a positive role in its implementation. However, it is important that marine spatial planning is properly utilised to map **all** of the UK's seas, taking into account **all** energy sources, uses, activities, whole life-cycle impacts and areas designated for protection and conservation.

Climatic Factors

WWF-UK underlines the fact that the SEA Directive includes secondary, cumulative impacts, and this should apply to emissions from fossil fuel products made available via ongoing licensing for oil and gas. The equivalent of 70% of the UK's CO₂ emissions has arisen from the oil and gas from the UK Continental Shelf Seas. This is through indirect and cumulative impacts.

As the Intergovernmental Panel on Climate Change (IPCC) concluded earlier this year, "*the primary source of the increased atmospheric concentration of carbon dioxide since the pre-industrial period results from fossil fuel use*"⁸. The situation is now graver than scientists have

⁸ IPCC Fourth Assessment Report Working Group I: Summary for Policymakers. Feb 2007.

ever understood before, and the recent IPCC reports have indicated this with an increased urgency of our need to change from our business as usual approach to achieve things differently.

The UK's Energy White paper urges alternative thinking – we should be developing alternative renewable installations with an urgency to meet the seriousness of the situation acknowledged by the IPCC, EU and other parts of the Government.

As we have highlighted in our comments on previous SEAs, WWF-UK were very concerned to read that DECC and their contractors, Hartley Anderson Ltd, consider that domestic hydrocarbon production is carbon *neutral* (or even potentially *positive* regarding imported oil) in the attainment of the UK's climate change response policy objectives. WWF believes this is a gross misrepresentation of the factors influencing energy sourcing, and we would suggest that DECC amends this position. The phrase 'carbon positive' is not clear and should be avoided. WWF-UK considers that carbon positive suggests an increase in net carbon, in which case, we agree that licensing for oil and gas is 'carbon positive'. However, references in the SEA to other plans/programmes and activities in other countries or elsewhere is not relevant and misleading. This SEA is right to conclude that this plan/programme has the potential to impact the climate through climate change. This is a significant and important impact and should be mitigated. Other plans/programmes which also lead to climate change compound this impact and make it more serious and significant, rather than less, as is suggested in the SEA.

The amounts of greenhouse gases expected to be released by carrying out this plan should be quantified and then fully assessed in accordance with the SEA Directive, for their nature relating to: significance, scale, importance, reversibility and others.

The climate change response policy objectives referred to actually advocate an increase in renewables and lower carbon sources of energy. If less hydrocarbons were produced (whether foreign or domestic), because these could be provided by alternative lower-carbon forms of energy, this would result in less greenhouse gas emissions. Also energy efficiency and energy demand control can help reduce the need for energy consumption. We submit this is more closely aligned to the concept of 'carbon positive', as might be more widely recognised by other Government departments and the majority of society.

In presenting this as a carbon neutral/positive situation, it seems the only real alternative DECC has considered to domestic hydrocarbon production is foreign imported hydrocarbons. It does not seem that indigenous renewables are considered as adequate alternatives. The timescale from award of licence to landfall of produced hydrocarbons can take more than a decade – huge energy efficiency measures and renewable forms of energy could be developed and implemented within that same timeframe, in a truly carbon positive approach for less money. In addition to securing sufficient supplies of energy, the Government also has the responsibility to ensure the energy used within the UK comes from the cleanest source possible.

Limitations for Siting of Wind Farms

WWF-UK notes that the Environmental Report provides a number of recommendations for the siting of offshore wind farms, potentially limiting areas where they can be located. Such limitations include:

- a 12nm buffer zone from the coast, to reduce conflicts with landscape/seascape receptors and avoid potential public opposition and extending consenting timescales;
- siting outside of areas important for navigation;
- avoidance of waters near the coast and especially important fishing areas offshore;
- areas where wind farms may interfere with reception and discrimination of military radars and civilian aerodromes and radar systems.

WWF-UK is concerned to note that these same limitations are not considered in respect of the siting of oil and gas infrastructure, even given the potential for significant adverse impacts

arising from the activities associated with oil and gas exploration and extraction from pollution in the sensitive littoral and coastal zone. If government is serious about protecting the marine (estuarine, fluvial and terrestrial) environment then it should be placing restrictions and limitations on the most polluting sectors/industries/activities not the other way around like at present. WWF-UK has previously commented that oil and gas infrastructure should also be considered as visually intrusive in its locations near coastlines. We, therefore, requested that for visual intrusion and protection of coastal sensitivities a coastal strip be devoid of oil and gas drilling and production installations comprising a minimum width of 8 kilometres, but extending to 13 kilometres in areas of particular sensitivity.

WWF-UK requests clarification on why specific siting limitations have been recommended for offshore wind farms but not for oil and gas infrastructure. We recognise that the differences in type of infrastructure will play a part in determining where offshore wind farms can be sited, yet given the nature of the limitations and other interests stated above, it could be argued that the same considerations would apply in respect of oil and gas infrastructure. For this reason, we are confused by the stricter conditions that appear to be applied to offshore wind farms and the apparent bias towards unrestricted development of oil and gas infrastructure.

Interrelationships – Cumulative Effects

WWF-UK previously commented that for the purpose of SEA Environmental Reports, climate change should be described as an incremental effect - i.e. *“effects from licensing E&P activities, which have the potential to act additively with those from other oil and gas activity”*. In which case, we recommended the need to include (as incrementals of a cumulative effect) emissions from end use of all hydrocarbons produced as a result of all licensing rounds since 1964.

The Environmental Report does consider the atmospheric emissions from oil industry activities that may result from implementation of the draft plan/programme and that the end use of any hydrocarbons produced will contribute to overall global gas emissions of greenhouse gases. However, it is concluded that the scale of such emissions is relatively small. It is also concluded that there were *no* secondary or synergistic effects identified that were considered to be potentially significant, besides a minor contribution to climate change and ocean acidification.

WWF-UK strongly disagrees with these conclusions and encourages DECC to further consider its responsibilities when assessing impacts from licensing oil and gas activities on climate change and ocean acidification. For example, by separating out climate change/ocean acidification effects as secondary, then cumulative, then look at the trans-boundary effect – it is important to look at these effects accumulating. A synergistic cumulative assessment of all impacts over time is required, accounting for all the varying stressors on receptors - i.e. climate change plus fishing plus noise plus....etc.

Recommendations:

In reviewing the Offshore Energy SEA, WWF-UK makes the following recommendations or requests for consideration by DECC:

- that a pre-cautionary approach is taken to opening up these diverse but poorly understood areas to development and not open up all areas to licensing in the presumption that all impacts can be managed;
- we see the scope of the SEA as too narrowly focussed and advocate a shift to expand consideration of environmental assessment in a truly strategic way;
- that DECC support the MMO in giving statutory advice to the IPC and planning for all UK waters to help ensure sustainable use of marine resources;

- that there is a fundamental change in the approach used in identifying alternatives, including obviating development;
- that it is inappropriate for DECC to rely so heavily on security of supply as the reason to continue the UK's oil and gas dependency, it should be removed from the SEA as it is not within the remit of the SEA Directive, but comes into consideration at a subsequent stage of the decision making process;
- we recommend the need to include (as incrementals of a cumulative effect) emissions from end use of all hydrocarbons produced as a result of all licensing rounds since 1964;
- we request the coastal strip be devoid of oil and gas drilling and production installations, comprising a minimum width of 8 kilometres, but extending to 13 kilometres in areas of particular sensitivity, due to the potential of damage and pollution to the sensitive coastal strip, which applies only to oil and possibly gas production but not at all to wind farms;
- we see no justification to have a presumption against wind farm development in the coastal zone as a blanket conclusion and request that the suggested flexibility in the buffer zone be applied;
- we encourage DECC to assess their sanctioning of potentially damaging practices associated with oil and gas licensing, especially to acknowledge the need for adherence to strict wildlife licensing criteria (re OMCR), aimed at increasing the protection of habitats and species;
- we request that in licensing areas from this or previous SEA rounds, any blocks containing or bounding SACs, pSACs, SPAs, pSPAs, extension and potential offshore sites be subject to Appropriate Assessment (AA) with a presumption they are excluded from licensing;
- that our comments on previous SEAs are considered as still valid, as they continue to reflect our concerns for licensing in those areas. This especially applies to our requests to withhold licensing blocks in:
 - SEA2: the shallow gas pockmarks in Blocks 15/20c and 15/25d, previously withheld during SEA, now available for licensing;
 - SEA5: the bottlenose dolphin SAC in Cardigan Bay (Blocks 106/30, 107/21 and 107/22) should be excluded from the SEA in line with the previous Appropriate Assessment (AA) which concluded that licensing should not be undertaken in this region;
 - SEA6: the bottlenose dolphin SAC in Moray Firth (Block 17/3) should be excluded based on the potential impact on bottlenose dolphins;
- we request the inclusion of harbour porpoise (*Phocoena phocoena*) in the assessment in Section A3a.7.17 and throughout the SEA as appropriate as harbour porpoise are an Annex II Habitats Directive species along with *Tursiops truncatus* (bottlenose dolphins);
- that all areas excluded from licensing in previous SEAs be excluded from this SEA also, especially protected areas;
- that CCS be included in this SEA in the gas storage section and as a mitigation measure for oil and gas licensing. It should be conditioned, for example, that all new pipelines should be sufficient specification to withstand the corrosiveness of CO₂, in case it is possible to use the site for CCS in the future;

- there needs to be a better prediction of impacts from emissions of greenhouse gases from plans to license for oil and gas exploitation. Specifically, it is recommended that the SEA should identify and predict likely quantities of emissions based on the barrel of oil equivalents. The SEA states that 35 billion barrels of oil equivalent (boe) have been extracted to date and that an estimated 5-25 boe remain to be extracted. The tonnes of CO₂ equivalents should be given for these figures;
- that the presumption that domestic hydrocarbon is carbon neutral (or even carbon positive when importing is considered) is a gross misrepresentation of the factors influencing energy sourcing, and we would suggest that DECC amends this position;
- we recommend that the phrase 'carbon neutral' is a fairly well understood phrase, but is subject to a consultation currently and as yet has no clear meaning, as such it should be explained what is meant by this phrase;
- we note that the phrase 'carbon positive' is not well understood and can be interpreted to mean either a net reduction or conversely a net increase in carbon emissions. Without clear understanding in both technical fora and in the public arena and a clear explanation of the meaning of this term, it should be removed from the SEA as it can be misleading;
- we consider that the only statistically valid conclusion from an SEA for oil and gas licensing is that this plan will lead to a net increase in CO₂ emissions and that of other potent greenhouse gases, with a direct and indirect impact on the climate which is cumulative, synergistic and transboundary. This conclusion should be made explicit in the SEA;
- that the conclusion that this plan will be carbon neutral or that it will emit less greenhouse gases than another project in other countries be removed from the SEA, as this is not relevant and directs decision makers towards decisions which may not be based on a true reflection of the importance and significance of this plan's impacts on the environment and on human health and wellbeing;
- that the conclusion that this plan will result in a small fraction of UK emissions be amended to acknowledge that cumulatively, the series of rounds of plans to license for oil and gas has a significant CO₂ emission level and impact on the climate. Production of UK oil and gas has been equivalent to 70% of UK CO₂ emissions overall. This is significant and should be accounted for in the SEA;
- the Climatic Factors section is dominated by information on energy supply and production and WWF submits that it should be in an earlier section as it is of generic interest, not exclusively to climatic factors;
- climate change is the single most significant impact from oil and gas development on a global scale yet it receives a very small portion of attention in the SEA. The section fails to calculate or properly predict the potential impacts, their significance, importance, reversibility etc, as required by the SEA Directive. It simply lists them. The section seems incomplete and has no conclusions, recommendations or mitigation measures considered. Given the nature, gravity and serious nature of the potential impacts which are listed, this oversight must be addressed to complete the SEA and to be compliant with the SEA Directive;
- the failure to have conclusions and mitigation measures in the Climatic Factors section is inconsistent with the assessments of impacts in other sections, such as on cetaceans and is not compliant with fulfilment of the directive;
- that negative impacts of climate change on the economy and people be considered and the SEA must be revised to do so;

- of the climate impacts predicted, none are quantified or assessed in terms of scale, importance, significance, reversibility or other criteria required in the SEA Directive. This must be done to complete the SEA and fulfil the requirements of the Directive;
- in the information given on the impacts on the marine environment, it would be worth utilising and referring to www.MCCIP.org/arc;
- the language about positive radiative forcing rather than using familiar phrases such as climate change or global warming, is not consistent with the requirements for public participation in the SEA Directive and makes the Environmental Report less accessible. More readily understood phrases should be used;
- on page 179, the Environmental Report states that “*CO₂ emissions which may be linked to climate change*”. WWF-UK is deeply concerned to see DECC express the view that CO₂ may be linked to climate change. This phrase should be removed from the SEA. The link between CO₂ and climate change is virtually certain, as defined by IPCC, and it is damaging for DECC to be undermining this science basis;
- in the context of the SEA, better reference should be made to the Kyoto Protocol, EU Energy Package, Renewables Obligation, UNFCCC and UK targets;
- WWF-UK has previously submitted reports which indicate methods for reducing and offsetting climate change impacts from licensing of oil and gas. We request that DECC includes ways of mitigating climate change impacts from the plan to develop energy resources in the marine environment and submit our previous advice on this matter to offer constructive ideas of how this might be approached (See Annex 1).
- **the Environmental Report does not fully comply with the requirements of the SEA Directive, therefore, WWF-UK rejects this report as a complete SEA and requests that it be amended and re-issued. It must identify, predict and estimate impacts on the climate from this plan/programme, and in-combination with other plans/programmes. The SEA is duty bound then to propose ways to reduce the impacts on the climate and mitigate (off-set in this context) any residual impacts on the climate.**

ANNEX 1

Climate Change in SEA

Suggested text for SEA7

Johnson and Lewis-Brown, March 2007

Incorporating Climate Change into the SEA7 process and Environment Report

WWF has been working with the DTI through the SEA Steering Group and numerous SEA consultation rounds to ensure the impacts on and from climate change are better incorporated into the environmental assessment of the SEA process, and by association, better incorporated into the resulting Environmental Report (ER).

The Energy Resources and Development Unit (ERDU) has the responsibility for licensing exploration and regulation of development of the UK's oil and gas resources¹. The DTI has confined their SEA processes to licensing of oil and gas resources, managed by ERDU, or more specifically by the Environmental Policy Unit of the Offshore Environment and Decommissioning Dept of the DTI. We understand that it is very difficult for this Department of the DTI to fully incorporate impacts on and from climate change in relation to energy provision. This is because their focus is solely on oil and gas licensing, whereas decisions on renewables licensing are taken in another department and therefore cannot be aligned strategically with decisions being made for oil and gas licensing. WWF's preference is that SEA be utilised as part of the broad-scale Energy Review, to be able to more effectively assess the right solutions for our energy provision.

Nevertheless, it is still important to incorporate climate change impacts into the oil and gas licensing process, and this document suggests specific areas where this might best be achieved. We realise that the environmental assessment for SEA7 has more or less been completed, and hope that WWF's collaborative efforts to ensure inclusion of climate change have been taken into account thus far.

We suggest several paragraphs in this document which may be considered for inclusion in the SEA7 Environmental Report. Our caveat is that they not be bolted on to existing text where full consideration has not yet been given to climate change implications, but instead used effectively to better represent where climate change has been incorporated into the assessment following our ongoing discussions.

To re-iterate the messages from our previous communications, four areas where WWF believe improvement could be achieved include:

- Obviating development and alternatives considered and documented in the SEA
- Links between the alternatives and the objectives of SEA7
- Consideration of indirect and cumulative impacts of SEA7, particularly climate change impacts
- Mitigation and offsetting of adverse impacts predicted or detected in monitoring.

The following sections include suggestions for text inclusion by chapter, following on these themes. We understand that the structure will remain similar to that for the SEA6 Environmental Report, so have numbered these sections accordingly.

Non-technical summary

As appropriate, based on inclusions in other chapters

Section 2: SEA Process

Inclusion of text (perhaps in Section 2.3) to highlight how consideration of climate change impacts has been incorporated:

“With the increasing recognition of our need to move to a lower carbon economy, the DTI has been working with stakeholders to better incorporate the impacts from hydrocarbon exploration and development on climate change. We recognise that climate change and ocean acidification are placing increasing burdens on our marine environments and our intention is to include assessment of those impacts within our SEA process”

Section 3: Regulatory Context.

In Section 3.4 Relationship with other relevant plans and programmes, under UN Framework Convention on Climate Change, change text under “Implications for draft plan” to:

“Consider contributions to greenhouse gas emissions as a result of licensing. Include assessment of greenhouse gases associated with combustion of hydrocarbons produced as a result of proposed activities within this assessment. On an ongoing basis, continue to assess the greenhouse contributions from all licensing rounds in a cumulative fashion.”

Section 4: The Draft Plan and Alternatives (wondered why this is a draft?)

In Section 4.1 Background, need to explicitly state what the draft plan is, and what its objectives are. In addition need to state the objectives of the SEA, as these are different.

If the draft plan is “*to offer up for license all unlicensed blocks in both the current and previous SEA areas*”, then a suggested objective of that draft plan could be “*to enhance the UK’s security of energy supply, and as a result enhance the UK economy*”.

The suggested objective of the SEA could be:

“to protect the environment from adverse impacts associated with decisions made in achieving the draft plan”.

In Section 4.2 Draft Plan and Alternatives, suggest inclusion of new text at start of section:

“One way to enhance the UK’s security of supply is through further oil and gas licensing. The oil and gas licensing programme is required to allocate remaining blocks not already utilised by the oil and gas industry. In the UK Government, we understand that a move to a lower carbon economy is an important and urgent requirement, but wish to continue to access new hydrocarbon resources to secure supply during this transition.”

We suggest that whilst the SEA focus remains just licensing, the list of alternatives be changed to a hierarchy of alternatives, along the lines of:

- not to offer any block for production licence award as energy efficiency measures have been/will be implemented and the demand for energy can diminish;
- not to offer any blocks for production licence award as lower carbon alternatives will provide the energy that oil & gas licensing would have otherwise provided;
- to restrict the number of blocks licensed (spatially) so that a more balanced proportion of energy provision can be split between oil & gas and lower carbon energy alternatives;
- to restrict the number of blocks licensed (spatially and temporally) due to environmental sensitivities highlighted in the environmental assessment;
- to offer all blocks within the licensing area.

WWF recommend that the SEA process be expanded to provision of energy (instead of just oil and gas licensing).

Alternatives should include a hierarchy of different types of lower carbon alternatives e.g. biofuels, tidal & wave renewables, wind farm (wet & dry) renewables, etc. This would help foster

technological innovation in their continued development, and in the search for additional lower-carbon sources and technologies.

Those alternatives already being considered should include more detail about how the spatial and temporal limitations might reduce the potential for adverse impact i.e. what conditions would be put in place, which species in particular is the condition meant to better protect, etc.

Comparative analysis should be provided to show the alternatives have been quantitatively or qualitatively assessed and compared.

Section 5: Physical and Chemical Environment

5.3: Climate and Meteorology

Include sentence along the lines of:

“Because of the vast body of scientific evidence proving human-induced climate change, we need to acknowledge that not only is the climate changing (so any future development needs to be able to exist in a more harsh climatic environment), but also that potential development impacts on receptors need to be more carefully assessed with this in mind.”

5.4.4 Potential impacts of climate change on oceanography are included which is good, but these could be linked to climatic impacts seen in the next section on Ecology.

Section 6: Ecology

Some acknowledgement of climate change impacts (e.g. plankton), but need to include more details on how climate change might already be having adverse impacts on each element of the ecosystem, especially including those receptors most at risk from potential impacts of oil and gas development. It should utilise the IPCC Third Assessment Report, and forthcoming report, also the MCCIP ARC (mccip.org.uk/arc). It should also include the impacts of ocean acidification from the release of CO₂ dissolving into the oceans and forming carbonic acid.

Section 7: Conservation

Indicate which parts of the wider environment (marine and terrestrial) and the conservation sites that are already showing signs of depletion/degradation due to climate change – these may continue to degrade unless active steps are taken to reverse the situation (i.e. primarily involving a move to a lower carbon economy). It should also refer to predictions for future climate change impacts.

Section X: There should be a section on human health which refers to the impacts of climate change, using the IPCC Third Assessment report, or the forthcoming 4th Assessment, World Health Organisation and other relevant texts.

Section 9: Consideration of the effects of licensing

Impacts of oil and gas licensing on climate change and ocean acidification should be assessed in the SEA. The likely releases of greenhouse gases should be quantified. These are clear indications of indirect effects from a draft plan that focuses on licensing of oil and gas activities i.e. if there had been no licensing of oil and gas resources, and instead cleaner energy sources had been developed earlier, then we would not be seeing the changes in climate and oceans which we are now experiencing. Therefore impacts from use of oil and gas should be incorporated into the assessment.

Suggested text:

“Climate change and ocean acidification are indirect, yet significant, impacts from our use of oil and gas products.”

“The assessment of cumulative impacts should incorporate impacts from climate change as an additional lens through which to assess the scope of effects. Species and communities already suffering perhaps from impacts from fishing, disturbance (and the potential of additional hydrocarbon development) are now also having to cope with warmer/colder waters, changing food distributions, changing season lengths/intensity and increased acidification of waters. So this additional burden from climate change might make those species more vulnerable to hydrocarbon development related impacts, which we do not yet fully understand.”

The climate change impacts themselves should be considered, but also in combination with other impacts, and also with the cumulative impacts of previous cc impacts from oil and gas activities.

Section 9.8.1.4 discusses the increase in gaseous emissions from the combustion of hydrocarbons, although this focuses on emissions directly from exploration or production activities on the associated installations. We acknowledge that it is difficult to assess the volume of hydrocarbon that might be derived from a well that is yet to be drilled or from a reservoir yet to be surveyed, but to estimate an average well output from across the whole of the UKCS would at least be some initial indication of the potential hydrocarbon which may be generated. This is done in other for a, such as renewables SEAs and in carbon disclosure reports by BP and Shell. Section 4.3 indicates the potential activity that could be expected following licensing, and thus provides the basis on which all further impacts within the report are assessed. Similarly, this provides an initial scenario on which potential hydrocarbon output could be based, and therefore associated greenhouse gases from combustion of this hydrocarbon estimated.

Then suggested text could build on this approach and say:

“In a similar way to how the positive greenhouse gas avoidance from offshore wind developments (see Section XXX in Wind SEA environmental report) is used, we are able to better quantify the impacts from oil and gas licensing.”

How environmental mitigation measures have already been incorporated into offshore oil and gas development should be highlighted e.g. reduction of venting and flaring, use of wind turbines. These should be assessed for their climate change mitigation potential, and whether performance is achieving the objectives of SEA.

Section 11: Conclusions

Better describe those alternatives that are already being considered i.e. how certain spatial and temporal limitations should reduce potential impacts.

Provide more detail on the conditions placed on licensing in sensitive blocks. Plus provide more detail on any mitigation measures required of the licensee.

Quantify remaining greenhouse gas likely releases from exploration, exploitation, transport, processing and use of the oil and gas etc.

Requirement on those operators:

- exploring or operating in those blocks with specific conditions to provide evidence of steps being taken to improve conditions for biodiversity and /or counteract relevant climate change impacts, and make this information publicly available.
- to commit to construction of installation infrastructure so as to be CO2 storage compliant if required in the future.
- off setting residual impacts.

ⁱ From DTI Oil & Gas website http://www.og.dti.gov.uk/about_us/structure.htm - March 2007