

# Offshore Renewables – guidance on assessing the impact on coastal landscape and seascape

Guidance for Scoping an Environmental Statement

March 2012



**Scottish Natural Heritage**  
**Dualchas Nàdair na h-Alba**

All of nature for all of Scotland  
Nàdar air fad airson Alba air fad



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## Glossary

<b>Coastal Character Area</b>	A Coastal Character Area is a recognisable geographical area which has a consistent overall character at a strategic level. It is usually a modest single loch within a larger system, a stretch of coastline with a relatively consistent overall character, or a whole island.
<b>Coastal zone</b>	The space in which land-based activities and terrestrial environments influence the marine environment and <i>vice versa</i> (Hiscock 1996), but there is no universally recognised definition for the coastal zone (e.g. see Harden Jones 1994). Pragmatically, the seaward boundary to the coastal zone is usually set by the limits of enabling legislation. For the purposes of assessing offshore renewables the coastal zone is taken to be the area confined to Scottish Territorial Waters, that is 12 miles (9.6km)/ offshore.
<b>EIA</b>	Environmental Impact Assessment, the process by which the identification, prediction and evaluation of the key environmental effects of a development are undertaken, and by which the information gathered is used to reduce the likely negative effects during the design of the project and then to inform decision-making.
<b>European Landscape Convention</b>	Also known as the Florence Convention, the ELC promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. It is the first international treaty to be exclusively concerned with all dimensions of European landscape.
<b>Intertidal</b>	The foreshore or area of seabed between high water mark and low water mark which is exposed each day as the tide rises and falls.
<b>Landscape character</b>	'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another' (Swanwick, C. and Land Use Consultants, 2002, page 8)
<b>LCA</b>	Landscape character assessment, a documented process which describes and categorises the landscape, highlighting key landscape characteristics and main forces for change.
<b>Local Coastal Character Areas</b>	Areas of consistent and distinct coastal character defined on the basis of physical and perceptual attributes. See Tables 1 & 2, page
<b>LVIA</b>	Landscape and Visual Impact Assessment – a standard process for examining the landscape and visual effects of a development.

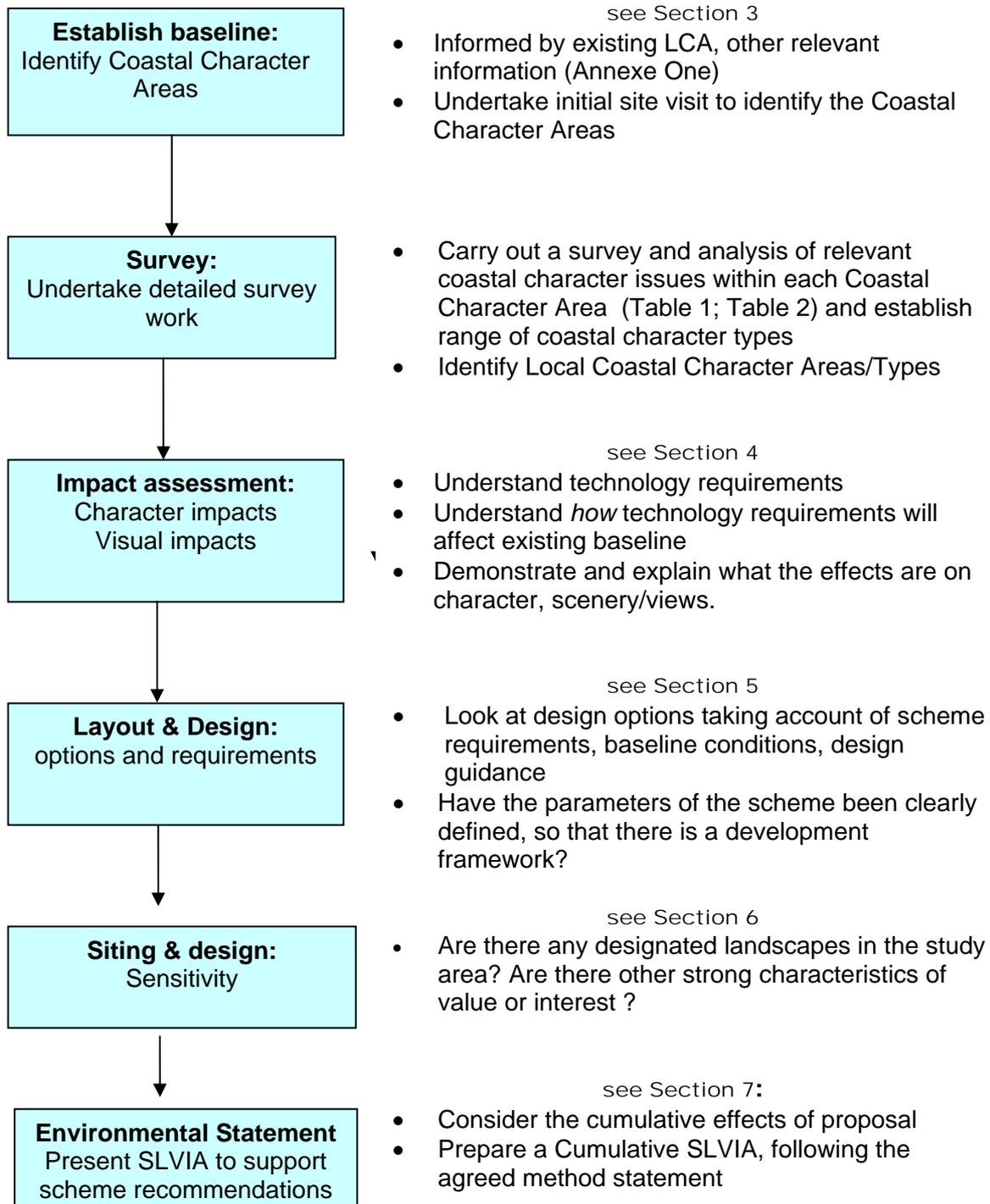
<b>Marine Licence</b>	Marine Scotland regulates marine licenses under the Marine Scotland Act 2010, on behalf of Scottish Government. Activities covered include coastal and marine developments of windfarms, wave and tidal power; and the removal and disposal of marine dredged material at sea.
<b>MSLOT</b>	Marine Scotland Licensing Operations Team is responsible for issuing development consents within waters 0-12nm and 12-200nm, for marine licences and consents for marine renewable energy projects under Section 36 of the Electricity Act 1989.
<b>NSA</b>	National Scenic Area – an area designated for its outstanding scenic value and beauty in a national context.
<b>OREI</b>	Offshore Renewable Energy Installations comprising Wind Turbines, Wave Energy Converters and Tidal Energy Converters
<b>Repowering</b>	Repowering is the process of replacing older equipment with new equipment or components that increase capacity, generation or provide greater efficiency.
<b>Seascape</b>	The visual and physical conjunction of land and sea which combines maritime, coast and hinterland character (Grant, 2005)
<b>SPP</b>	Scottish Planning Policy. A statement of Scottish Government planning policy on nationally important land use and other planning matters.
<b>SLVIA</b>	Seascape, Landscape and Visual Impact Assessment. The <b>accepted methodology</b> underpinning SLVIA is that of <b>LVIA</b> . See LVIA
<b>VIA</b>	Visual Impact Assessment, part of the LVIA process, which considers potential changes that arise to available views in a landscape from a development proposal, the resultant effects on visual amenity and people’s responses to the changes.
<b>ZTV</b>	Zone of Theoretical Visibility – a mapped visualisation of the areas over which a development can theoretically be seen.

### Abbreviations

<b>CCW</b>	Countryside Council for Wales
<b>DTI</b>	Department of Trade and Industry
<b>EIA</b>	Environmental Impact Assessment
<b>TCE</b>	The Crown Estates
<b>LI-IEMA</b>	Landscape Institute and Institute of Environmental Management & Assessment
<b>SCAPE</b>	Scottish Coastal Archaeology and the Problem of Erosion
<b>SEA</b>	Strategic Environmental Assessment
<b>SNH</b>	Scottish Natural Heritage

## Summary of approach

Seascape, Landscape and Visual Impact Assessment of Offshore Renewables can be divided into six key stages – aimed at identifying how the proposal will change the baseline conditions. An ‘SLVIA’, is so named because it includes ‘seascape’, that is an area of sea.



# Part 1

## Introduction: the Need for Guidance

- 1.1 Scotland's coast is highly regarded on account of its diverse character and the recreational opportunities it offers. Scottish Planning Policy (SPP)<sup>1</sup> highlights its international and national importance, and the need to ensure sustainable development through coastal and marine planning.
- 1.2 There is huge potential for harvesting wind, wave and tidal energy from our surrounding seas, and a growing interest in securing these renewable resources. This guidance supplements SNH's Marine Renewables Statement which recognises '*if sensitively designed and sited, marine renewables have the potential to have a lesser adverse effect than land-based renewable developments of a comparable capacity. Offshore wave and tidal stream generators appear to have the potential to make least impact.*'<sup>2</sup> Our interests lie in securing offshore renewables that are well designed and sited, so that they contribute positively to our social, economic, cultural and environmental needs.
- 1.3 Marine renewable energy developments raise a range of natural heritage issues that require assessment. These include landscape character, visual amenity and recreation in respect to both land (the coast) and sea (seascapes). This note provides guidance on the issues to be considered in a Seascape, a Landscape and Visual Impact assessment (SLVIA) within an Environmental Statement (ES), in the interests of developing and achieving good practice.
- 1.4 The Guidance seeks to:
  - draw attention to existing relevant guidance,
  - suggest where existing guidance (for terrestrial development) can be critically applied and may assist in assessment of developments in the marine environment,
  - explain the scope of necessary work and suggest some outputs to support an adequate SLVIA for offshore renewables.

This guidance solely relates to the offshore elements of an offshore renewable project. Other guidance is available for consideration of onshore ancillary works..

- 1.5 The Guidance is aimed at developers and consultants undertaking the assessment of offshore renewables as part of an Environmental Impact

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<sup>1</sup> A statement of the Scottish Government's policy on nationally important land use planning matters. February 04, 2010. See para. 98-103

<sup>2</sup> See: [SNH Policy Statement. Marine Renewable Energy and the Natural Heritage](#): An overview and policy statement.

Assessment, as well as SNH and local authority staff who have to advise and comment on the process. It should also be of use to Marine Scotland (as consenting authority) and may be useful for other consultees.

- 1.6 It may also be of use in assessing the impacts of smaller renewable energy schemes (that do not require formal EIA) on, or adjacent to, our shores.
- 1.7 Offshore renewables are as yet a relatively recent development, with many technologies in their infancy and existing only at test sites. Good practice in the assessment of offshore renewables will evolve over time as we gain knowledge and experience of them. As our understanding of the issues relevant to the assessment of marine renewable energy developments improves, this note will be reviewed and updated.

## Seascapes and coastal landscapes

- 1.8 'Seascapes' refers to '*an area, as perceived by people, from land, sea or air, where the sea is a key element of the physical environment*'. The term is commonly used and is included within the definition of landscape contained within the European Landscape Convention<sup>3</sup>.
- 1.9 Innovative work in defining seascapes, undertaken by the Countryside Commission for Wales was developed further in a SNH research project<sup>4</sup>. Both studies recognise that the coast is a significant part of the seascape, its characteristics affect seascape character and dominate how most people experience a marine development. The immediate hinterland (the landscape immediately adjacent to the coast) may also affect how we experience a marine development. Defining the character of the coast and its relationship with both its hinterland and the sea is an important aspect of the assessment process for offshore renewables.
- 1.10 A succinct definition of seascape is '***the visual and physical conjunction of land and sea which combines maritime, coast and hinterland character***' (Alison Grant, SNH 2007, SNH 2008). Without exception 'seascape' will exist in a coastal landscape context and influence its character. This approach has been adopted in Department of Trade and Industry Guidance which notes that every seascape comprises three components :
  - **the seaward = an area of sea**
  - **the coastline = a length of coastline**
  - **the landward = an area of land**

This is the meaning applied within this guidance, where seascape refers to an offshore area of sea and its relationship to the land.

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<sup>3</sup> See [European Landscape Convention](#), Florence, 20.X.2000

<sup>4</sup> *An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms*. SNH Commissioned Report 103, (2005).

- 1.12 In this guidance, inshore waters – Scottish Territorial Waters – comprise the ‘seascape’ belonging to the coastal zone. These extend to 12 miles offshore. As an example, Robin Rigg, the first offshore windfarm to be built, lies within this limit and within the ‘Inner’ Solway Firth. For the purposes of assessing offshore renewables, any development in/at sea within inshore waters will influence the character of the coastline, the sea and may, depending on the hinterland influence its landscape and visual character.
- 1.13 Offshore renewable schemes are also planned for waters further off our coasts. Where this is the case it is still relevant to assess their likely impacts on the coastal zone and hinterland. Even within offshore waters there are likely coastal and landscape impacts, due to their potential visibility. For some explanation of this **see SNH Commissioned Report 103, (2005), para 2.4 and Appendix B.**
- 1.14 The term SLVIA is commonly used to refer to Seascape, Landscape and Visual Impact Assessment. It is used in this guidance but it must be emphasised that **the process of LVIA – Landscape and Visual Impact Assessment remains the accepted methodology** underpinning the assessment.

## 2

# Methodology: Landscape and Visual assessment

## Key principles

- 2.1 Landscape and Visual Impact Assessment (LVIA) is a standard process of assessment. EIA Directive (85/337/EEC) requires member states to consider the effects of certain public and private projects on the environment before deciding upon granting consent. The Directive lists both projects which always require an EIA (Annex 1 projects) and those which must be subject to an EIA when they are likely to have significant environmental effects (Annex 2 projects). In addition under the Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008, specific projects may be required to undertake an EIA and, licensing of marine operations will only be issued pending the outcome of the EIA.
- 2.2 A LVIA is a likely requirement for marine renewable energy schemes. It provides a useful tool to demonstrate the probable environmental impacts of the development proposal.
- 2.3 ***The Guidelines for Landscape and Visual Impact Assessment*** (GLVIA) sets out an accepted and well established assessment methodology. The character assessment process for seascapes and coastal landscapes is essentially the same. However, in applying the guidelines, it is important to consider the key qualities and issues that are **specific to the marine and coastal environment, for example the conjunction of land, intertidal areas and open seas; the shape and scale of coastline; views from the coast and views from the sea** whether on ferries, sailing boats or sea-kayaks. These are the key issues that differ from those usually considered in a landscape and visual assessment; **it is not the method of impact assessment itself that differs.**
- 2.4 Key aspects of LVIA, and therefore SLVIA are as follows:
- it is an iterative process by which alternative sites and designs for a development are proposed, assessed, and amended;
  - it identifies the preferred siting and design option for a development;
  - it balances different issues relating to the environment, function, technical and economic requirements, and
  - it assesses the final proposal for predicted residual impacts on the seascape, landscape and visual resource.
- 2.5 Any SLVIA should assist developers, decision makers, members of the public and other interested parties by providing a clear and common understanding of the predicted effects of a proposal, in an impartial and professional way.

Assessments need to be rigorously documented and explained, as well as being objective.

- 2.6 Assessments need to be integrated with the other subject areas that are assessed. Clearly cross-referencing the SLVIA and other sections of the ES (such as tourism, recreation, cultural heritage, and transportation) will provide a sound understanding of how our coastal landscapes are used and appreciated, both from the land as well as from the sea.
- 2.7 SLVIA is best carried out by qualified Landscape Architects who aim to apply professional judgements in a structured and consistent way based on landscape design principles. Preferably, as with onshore LVIA, this will involve a team of at least two landscape architects.
- 2.8 LVIA comprises two separate parts, the Landscape Impact Assessment (LIA) and Visual Impact Assessment (VIA), although these are related processes as described within the GLVIA. Overall, the assessment :
- considers the effects of the proposal which may give rise to changes in character of the seascape and coast, and how this is experienced
  - considers the potential changes arising to views of a development proposal, the resultant effects on visual amenity and people's responses to the change.
- 2.9 **The various stages of a LVIA, as outlined in the [Guidelines for Landscape and Visual Impact Assessment \(GLVIA\)](#)<sup>5</sup>, will equate to those of a SLVIA.** In summary, these are:
- An understanding and definition of the **baseline conditions** of the study area (Section 3),
  - Assessment of how the proposed offshore renewable development will **affect** the baseline conditions – this requires an understanding of technology requirements (Section 4),
  - The development of **layout and design** concepts and objectives (Section 5), and
  - Decisions as to the most appropriate **siting and design** for offshore renewable devices (Section 6), which will have to consider **cumulative impacts** (Section 7).

These stages are outlined more fully below, presenting issues specifically relevant to offshore renewables.

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<sup>5</sup> See Section 2 in: The Landscape Institute and the Institute of Environmental Management and Assessment. (2002) *Guidelines for Landscape and Visual Impact Assessment*. Second edition, Spon press.

# 3

## Establishing baseline conditions

### Coastal landscape character

- 3.1 Defining the baseline character of the study area demands a specific focus on both the 'seaward' and the 'landward' elements. Duplication of assessment, potential confusion and over-complexity can be avoided by recognising that landscape character contributes to seascape character and vice versa. Understanding the character is a first step in good siting and planning for any renewable development. Character assessment:
- analyses the coastal landscape
  - identifies its elements and experiential qualities that are distinctive and typify the place.
- 3.2 The emphasis to be placed on individual aspects of assessment varies from case to case, however these include landform, openness, climate, scale, seascape, coastal and landscape character and features, marine features, aspect, visibility, designations and cumulative impacts. We recommend use of the coastal character method outlined in [Guidance on Landscape/Seascape Capacity for Aquaculture 2008](#).<sup>6</sup> Although developed for aquaculture capacity studies, this sets out a method to assess the character and visual qualities of the coastal landscape and seascape. By identifying **areas of consistent seascape character with strong integrity**, like a specific bay or stretch of coast, the complementary task is to discern the different **seascape/coastal character types**, some of which are likely to occur in more than one area.
- 3.3 The relevant issues to consider when defining the baseline **coastal landscape and seascape character** are outlined in Table 1. Table 2 summarises the **visual character** of the baseline conditions. Deciding which is the most suitable scale at which to define the areas is discussed below, **see Section 3.7 and Figure 2**.

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<sup>6</sup> [Guidance on Landscape/Seascape Capacity for Aquaculture](#). Natural Heritage Management, SNH (2008)

**Table 1 : METHODOLOGY FOR SEASCAPE/COASTAL ASSESSMENT: Establishing character**

Topic	Analysis of physical characteristics	Analysis of experiential characteristics	Judgments	Recognised values
<b>Maritime influences</b>	<ul style="list-style-type: none"> <li>• aspect and orientation</li> <li>• existing marine based activities</li> <li>• maritime processes and dynamics</li> <li>• scale, distance and expansiveness of open sea</li> </ul>	<ul style="list-style-type: none"> <li>• sense of space and light</li> <li>• sense of exposure</li> <li>• sense of containment or open-ness</li> <li>• sounds associated with the sea, smell of the sea</li> </ul>	<ul style="list-style-type: none"> <li>• unity of landscape character</li> <li>• aesthetic qualities, including characteristics, experiences, and perceptions which create exceptional aesthetic quality</li> <li>• assessing significance of physical characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• landscapes and seascapes designated because of their scenic, landscape or recreational value</li> <li>• landmarks designated because of their cultural or historic significance</li> <li>• longer distance routes</li> </ul>
<b>Character of coastal edge</b>	<ul style="list-style-type: none"> <li>• shape and scale of coastline degree of indentation and enclosure</li> <li>• presence of offshore islands</li> <li>• fragmentation of edge deposition features, tidal variations</li> <li>• landmarks</li> <li>• shoreline development</li> </ul>	<ul style="list-style-type: none"> <li>• sense of exposure</li> <li>• sense of containment or open-ness</li> </ul>	<ul style="list-style-type: none"> <li>• assessing intensity and significance of experiential characteristics</li> <li>• identification of dominant physical or experiential characteristics</li> <li>• identification of aesthetic attributes</li> <li>• determining the extent of the relevant setting for significant features and landmarks</li> </ul>	<ul style="list-style-type: none"> <li>• roads designated as scenic or tourist routes</li> </ul>
<b>Character of immediate hinterland</b>	<ul style="list-style-type: none"> <li>• key elements of landscape character</li> <li>• topography and relief</li> <li>• vegetation pattern</li> <li>• existing settlement pattern</li> <li>• landmarks</li> </ul>	<ul style="list-style-type: none"> <li>• sense of containment or open-ness</li> <li>• presence of maritime influence</li> </ul>	<ul style="list-style-type: none"> <li>• identifying relevant cultural associations with place</li> </ul>	
<b>Wildness/isolated coast</b>	<ul style="list-style-type: none"> <li>• presence of natural processes</li> <li>• presence of development/ human activity</li> <li>• actual accessibility</li> <li>• ruggedness of terrain</li> </ul>	<ul style="list-style-type: none"> <li>• sense of naturalness</li> <li>• perceived remoteness</li> <li>• sense of isolation</li> </ul>	<ul style="list-style-type: none"> <li>• intensity of sense of wildness</li> <li>• degree of ruggedness and perceived accessibility</li> <li>• degree to which natural processes dominate the experience of place</li> </ul>	<ul style="list-style-type: none"> <li>• Wild land search areas</li> </ul>

**Table 2: METHODOLOGY FOR SEASCAPE/COASTAL ASSESSMENT** : Issues explored on site visits: visual assessment from Grant (2008) for SNH Natural Heritage Management Series: *Guidance on Landscape/Seascape Capacity for Aquaculture*.

Topic	Analysis of physical elements	Analysis of type of views	Judgements	Recognised values
<b>Visual assessment</b>	<ul style="list-style-type: none"> <li>• presence of the coastal edge</li> <li>• presence of the open sea</li> <li>• focal points or features within the views</li> <li>• aspect and orientation of viewpoint, character of seascape</li> </ul>	<ul style="list-style-type: none"> <li>• overlook from settled areas</li> <li>• views experienced as part of a sequence</li> <li>• elevated viewpoints panoramas</li> <li>• sudden revelations</li> <li>• glimpse views</li> </ul>	<ul style="list-style-type: none"> <li>• significance of views and viewpoints</li> <li>• significance and dominance of compositional elements</li> <li>• quality of visual composition from viewpoints</li> <li>• significance of aspect and transient qualities such as quality of light and reflectivity</li> </ul>	<ul style="list-style-type: none"> <li>• views which contribute to the experience of a landscape or seascape designated for its scenic quality</li> <li>• views to and from features designated because of their historic significance</li> <li>• views from longer distance routes</li> <li>• views from popular recreational areas or specific facilities</li> </ul>

## Contributing information

- 3.4 Landscape Character Assessment (LCA) is a standard system for identifying, describing, classifying and mapping our distinctive and varied landscapes. A series of assessments exist for all parts of Scotland, they explain what makes landscapes different from one another and this system provides baseline information. Coverage across Scotland is given on SNH's [website](#)<sup>7</sup> with individual volumes readily available.
- 3.5 Review of the relevant LCA may help in understanding the physical coastal character, although not all areas are covered in the same detail. For example, the Fife LCA (No.113) covers the coast and shoreline at a 1:25,000 scale with good detailed descriptions of coastal characteristics. The Skye and Lochalsh LCA duly recognises the intermingling and inter-relationship between sea and land which dominate the landscape. Review of some LCAs for other purposes may include an appraisal of coastal landscapes, as for example the Western Isles.<sup>8</sup> The "Landscape Character Assessment Review" in SNH's Seascapes Study, Appendix C, summarises key characteristics, relevant to the coast, from the individual LCAs. This is useful, but in order **to determine local coastal character the original LCAs should be examined in conjunction with field survey and assessment.**
- 3.6 Coastal characterisation is likely to benefit from critical appraisal of the relevant sections of *The Beaches of Scotland* series<sup>9</sup>. This series of regional reports offers a quantified description of many aspects of Scotland's coastline, including associated dunes, links and machair areas. These can be useful in informing and defining local coastal character areas, although they are dated and some aspects may have changed due to coastal dynamics. Some further sources are outlined in **Annexe 1** 'Other Guidance and Information'.

## Scale of Assessment

- 3.7 The ***SNH Seascapes study (2005)***<sup>10</sup> is a **strategic assessment**, a 'nationwide' look at the coast. Scotland's coastline is classified into 33 coastal units, comprising 13 coastal character types (called 'seascape character types' in the 2005 study), **see Figure 1**. This establishes coastal character at the national scale, valid only at the broad, strategic level.<sup>11</sup> Outline descriptions of these [national coastal character types](#) is available on the SNH [website](#).

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<sup>7</sup> See <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/lca/>

<sup>8</sup> SNH Commissioned Report 42: *Landscape capacity study for onshore wind energy development in the Western Isles*.(2004)

<sup>9</sup> *The Beaches of Scotland*, Commissioned Report series. 18 Regional reports 1969-1981.

<sup>10</sup> [An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms](#). SNH Commissioned Report 103, (2005).

<sup>11</sup> See SNH Scottish Seascapes Study, Figure 22, p.46 and Appendix D: Description of Seascape Character Types

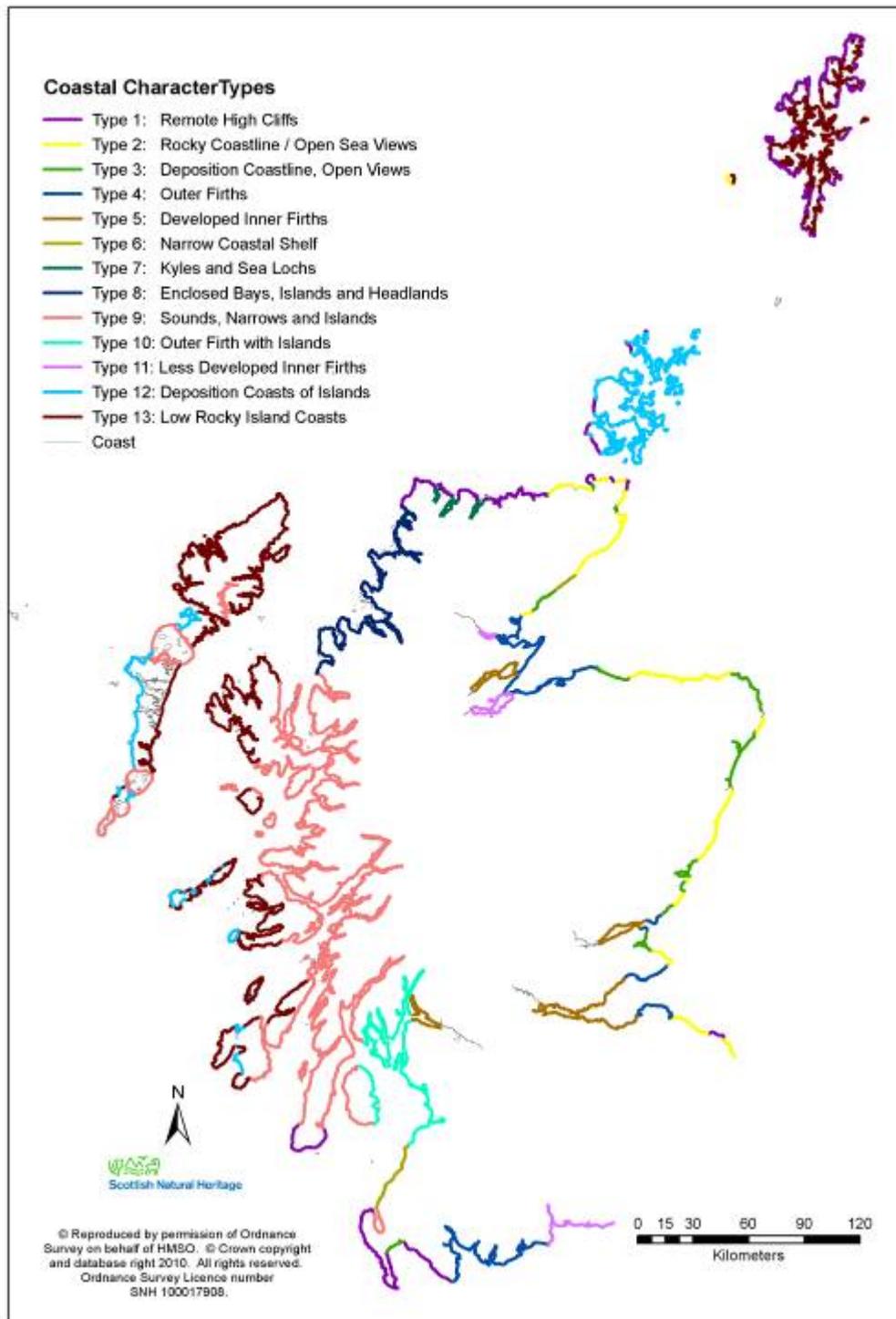
- 3.8 Coastal Character Areas encompass a large but consistent area of seascape, usually with a common geographic or place name, which forms the basis of the study area. These should be identified during the initial site visit. **When assessing specific development proposals – particularly wave or tidal devices, or an offshore windfarm located close to shore, a more detailed character assessment at the local level is needed.**
- 3.9 Local Coastal Character Areas are smaller in size; they further subdivide the Coastal Character Area into areas of consistent seascape character with a strong integrity, like a specific bay, section of coast or loch with a similar character. Identifying local coastal character areas is best done at a scale comparable to the existing Landscape Character Assessments, and will be informed by them. For example, Shetland's diverse and complex coastline and seascapes are defined in the SNH Seascapes study as two seascape character types (SCT 1: Remote High Cliffs and SCT 13d: Island sounds and voes). Any assessment for wave or tidal devices would need to examine the **local coastal character area at an appropriate scale.**
- 3.10 Strategically, these 'national level' seascape character types and areas will form a framework within which these local coastal character types 'nest'. This hierarchy of seascape character types is illustrated in Figure 2. It parallels the national landscape character typology classification for Scotland.<sup>12</sup>
- 3.11 Our Guidance on Landscape/Seascape Capacity for Aquaculture (2008), outlines how to define coastal character at a regional level and local character level. The background to how this methodology was developed is presented in SNH Commissioned Report, 215, as used in capacity studies for aquaculture<sup>13</sup>.
- 3.12 The coastal character areas are, in themselves, areas of consistent character. In assessing the impact of any development (renewables, aquaculture or shorebased development) the sensitivity of the coastal character areas will vary according to their characteristics. Assessing the sensitivity of coastal character types to a proposed development would follow on from defining the baseline.

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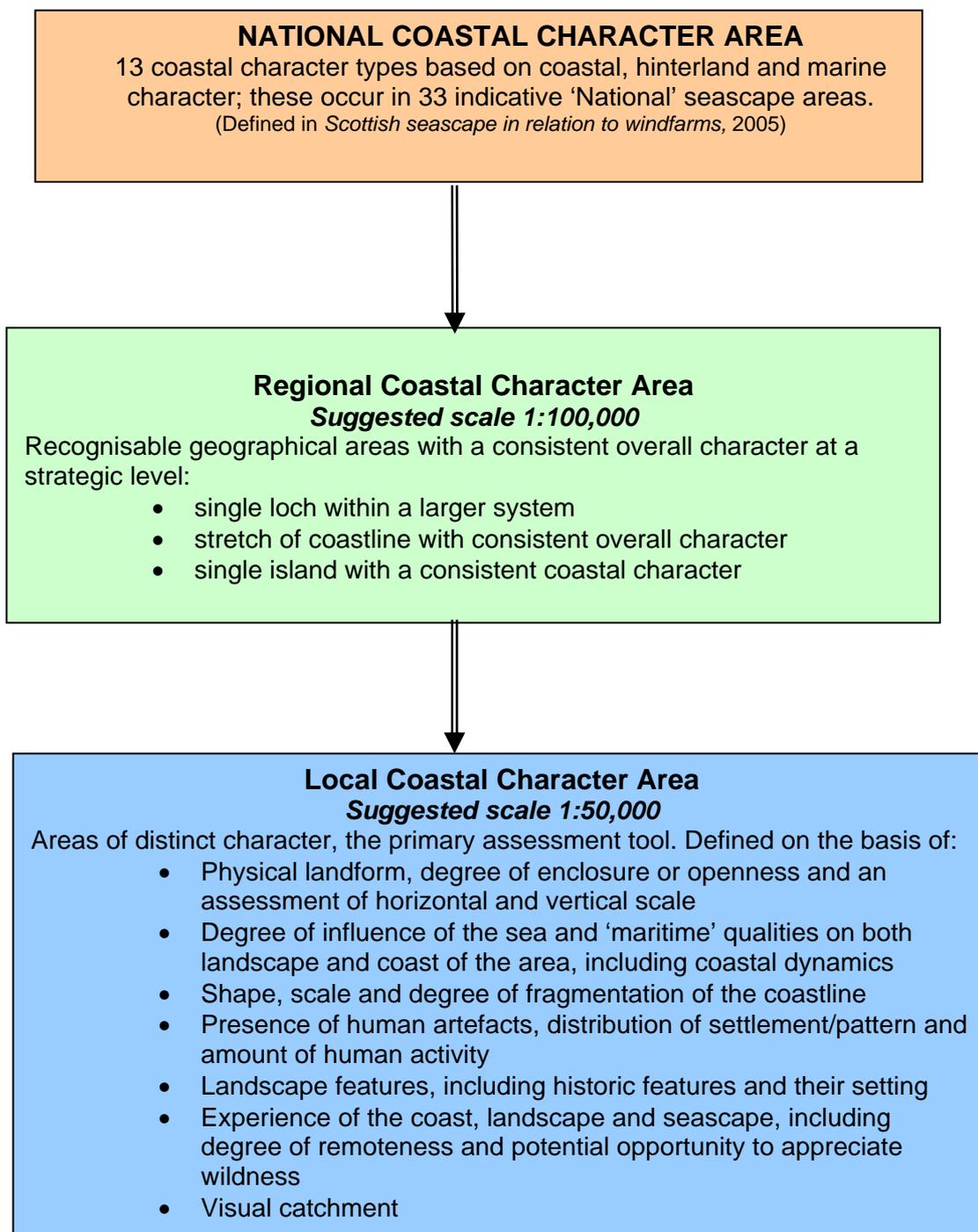
<sup>12</sup> SNH Unpublished Report. Analysis of National Landscape Character Types in Scotland (David Tyldesley and Associates, 1998)

<sup>13</sup> Grant A. (2006), [Landscape/Seascape Carrying Capacity for Aquaculture](#). SNH Commissioned Report No. 215

**Figure 1.** National coastal character types (from *An assessment of the sensitivity and capacity of the Scottish seascape in relation to offshore windfarms*. SNH (2005)).



**Figure 2: Hierarchy of coastal character assessment**



## 4

### Assessment of impacts

- 4.1 Understanding the development proposal, all its components and how these will impact on the seascape and landscape is essential to the assessment. This will include:
- a) Details of all **off-shore** elements of the scheme:
    - existing or proposed, permanent or temporary; including: turbines/wave/tidal machines, transformer stations, anemometers, lighting, navigational buoys,
    - Methods of working and any phasing should be detailed.
  - b) Assessment of all project stages: construction, operation, repowering, maintenance and decommissioning;
  - c) Assessment of potential impacts from
    - fixed locations, as well as
    - circulation routes: along road corridors, ferry routes, cruising routes and other routes (to include consideration of how the landscape is experienced sequentially experienced);
  - d) Assessment of alternative installation design and the implications of the alternatives on the proposal's overall effects, for example extent and pattern formed by installations.
  - e) Assessment of effect upon amenity: including access and recreation, tourism and wild land, cross referring to other sections of the EIA as necessary;
  - f) Proposals for mitigation and assessment of residual impacts;
  - g) Proposals for reinstatement, including method statements, as part of decommissioning plans;
  - h) Assessment of the potential for the development to combine with other developments – forming cumulative and in-combination impacts (including

sequential impacts). Where offshore windfarms are concerned this will include other offshore windfarms as well as those onshore. It may also be necessary to include windfarms beyond the ZTV area for the proposed development where cumulative effects may be significant (e.g. sequential effects on a key route). This should be agreed with the consenting authority / SNH. This is discussed more in Section 6.

- 4.2 The SLVIA should include separate assessment of the effects on seascape, landscape and visual resources, although as noted above these are linked processes. Issues specific to the physical impact assessment may also be pertinent to the visual impact assessment – for example with regard to light and lighting, as set out below.
- 4.3 **On-shore** elements of the scheme may be subject to a separate application process, however for S36 projects it is recommended that one Environmental Statement be produced which assesses all aspects of the project proposal. This should include on-shore grid connections, converter substations, tracks, access routes, buildings, plant, substations, anemometers, fences, storage areas, compounds, turning areas, hard-standing, car parks, lighting, and borrow pits. Note that the on-shore impacts of a proposal may be considerable. Some structures may be more permanent – as with buildings housing converter substations – than others, like temporary storage compounds. It is good practice to build in any anticipation of future expansion of a facility at an early stage, – especially where the project is experimental. Many local authorities have prepared design guidance on buildings in the countryside, or have supplementary planning guidance covering relevant issues which may assist in scoping out relevant issues. The LCA for an area may also offer some design guidelines (see 3.4).

## Impacts on character

- 4.4 The following issues are key considerations in offshore renewables assessment. They are critical in the development of mitigation strategies and design refinement:
- The key seascape and landscape characteristics of the study area that make it distinctive, and the particular relationship of the components of the proposed development to these (see Section 3.0, especially discussion referring to defining the baseline).
  - The character and experience of the seascape and landscape including the effect on the experience of wildness, isolated and remote coast.
  - Any easily recognised places such as sea lochs firths, or straits; landscape or amenity values, especially locations of value for recreational use, or scenery, e.g. viewpoints or landscape designations.
  - The experience of ‘Dark Skies’. In views out to sea from land, the experience is often of ‘darkness’ at night, with no lights out on the sea, except for shipping. This is an important attribute especially on

- the East Coast, where there is a relative lack of landfall/opposing shores;
  - at the edges of island groups in Orkney and Shetland and
  - along major linear peninsulas and islands of the West Coast.
- Daily changes specific to the coast – such as tidal movements and in particular views valued for their sunrises (on the East Coast) and sunsets (on the West Coast). In dealing with the latter, take note of specific local conditions where light reflected onto colourful island rock-faces can make it appear as if the sun is setting to the east, as well as to the west.
  - Assessment of impacts should make use of the appropriate Landscape Character Assessments and National Scenic Area descriptions (including special qualities work and all other relevant landscape and planning documents, **see Section 6.3**). This should include good practice guidance, wild land policies, siting and design guidance. Information on these is given in **Annexe One: Other Guidance and Information**.

## Visual impacts

- 4.5 In assessing visual impacts, reference should be made to our [Visual Representation of Windfarms: Good Practice Guidance, 2007](#) (currently under review)<sup>14</sup>. This provides practical guidelines recommended for the preparation, presentation and application of visibility maps, viewpoints and visualisations for different audiences. All significant elements of the proposal should be illustrated including navigational and aviation lighting.
- 4.6 Deciding which visual tools to use will differ according to the technology being assessed. While some techniques will be more relevant to the assessment of offshore windfarms than wave and tidal technologies, some techniques may be useful to both, for example the preparation of photomontages.
- 4.7 Zone of Theoretical Visibility (ZTV) maps are intended to help assess potential landscape and visual impacts by indicating the extent and distribution of theoretical visibility. They should not be regarded as a measure of impact in themselves, they are a tool to identify and assess potential significant visual impacts. The use of ZTVs early in the visual assessment process is useful because they can help inform the initial choice of viewpoints.
- 4.8 In judging a suitable radii for the ZTV, the following considerations are relevant:
- visibility conditions vary with some exceptional clarity at times; the [SNH Seascapes study \(2005\)](#) usefully highlights the limitations in applying significance to visibility ranges in Scottish conditions (see section 8.3 on visibility in Scotland,)

<sup>14</sup> [Visual Representation of Windfarms: Good Practice Guidance, 2007](#)

- many key vantage points from the tops of mountains, cliffs and hills have high sensitivity in terms of scenic value
- a high proportion of settlement is coastal, as are transport routes, so the coast is often of high visual sensitivity with high viewer numbers.
- experience of large on-shore windfarms (100+ turbines measuring 130m to tip) show important landscape impacts can extend well beyond 10km; as an example, theoretically, in clear visibility, an observer standing on the coast a few metres above sea level, with an eye height of 3m could see the tips of the blades of a 150m wind turbine at 28 miles, and the top of the tower structure at 20 miles,<sup>15</sup>,
- the eye is attuned to pick out groups and patterns, so those within a large windfarm may be noticeable at a distance – this emphasises the need further makes the case to explore a wide area
- where wave and tidal structures lie at sea level, or are raised only periodically above sea-level, the extent of visual influence will be considerably less than that of a windfarm, but nevertheless, exploring a ZTV at an initial stage of study will assist in scoping both the extent of potential visibility and the location of sensitive receptors.

4.9 In the visual assessment, consider the seasonal and diurnal patterns and cycles of visibility predominant in the locality, including any likely effects arising from lighting. A review of this is recommended, in preference to relying on generic visibility ranges, for example those quoted in Dti, (November 2005)<sup>16</sup> or CCW Seascape Assessment (2001)<sup>17</sup>.

4.10 Wave and tidal devices will require navigational; lighting, whilst offshore windfarms will require both navigational and aviation safety lighting.<sup>18</sup> Both mandatory and advisory requirements for the lighting and marking of renewable energy installations are complex. Requirements depend on the extent and nature of the development. The Marine and Coastguard Agency have produced a Marine Guidance Note 371 (M+F)<sup>19</sup>; while the International Association of Lighthouse

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<sup>15</sup> Taken from [Navigation in the Vicinity of Offshore Renewable Energy Installations. Steamship Mutual – RE 02 Loss Prevention Bulletin](#), page 2.

<sup>16</sup> Guidance on the Assessment of the Impact of Off-shore Windfarms : Seascape and Visual Impact Report. dti (November 2005)

<sup>17</sup> [Guide to Best Practice in Seascape Assessment](#). Maritime Ireland/Wales INTERREG 1994-1999. Countryside Commission for Wales, Brady Shipman Martin and University College Dublin (March 2001).

<sup>18</sup> A useful, general discussion is found in Navigation in the Vicinity of Offshore Renewable Energy Installations. Steamship Mutual – RE 02 Loss Prevention Bulletin, see above

<sup>19</sup> [Offshore Renewable Energy Installations \(OREIs\): Guidance to Mariners Operating in the Vicinity of UK OREIs](#)

Authorities have issued information on the marking of windfarms, wave and tidal devices and offshore structures.<sup>20</sup>

- 4.11 The SLVIA should take these requirements – for lighting, hazard/colour-marking and navigational buoys into account. The production of a ‘night’ visualisation can be helpful in illustrating some of the lighting effects. We have limited experience in the production of night time visualisations and encourage innovation in the development of techniques to best represent the impacts. The SLVIA will also need to detail the intensity, colour and direction of lighting and whether the lights are steady or flashing. Note that there are mandatory lighting requirements, and advice can be sought from the [Civil Aviation Authority](#)<sup>21</sup>. The Ministry of Defence may also require additional lighting requirements.

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<sup>20</sup> International Association of Lighthouse Authorities. [www.iala-aism.org/](http://www.iala-aism.org/)

<sup>21</sup> [The UK Civil Aviation Authority](#)

## Viewpoint selection

- 4.12 Statutory consultees (including SNH) and Local Planning Authorities should be consulted when selecting viewpoints. The planning authority may include additional residences and public buildings, as local authorities have other interests in addition to those of SNH. It is important to ensure that negotiation includes all relevant local authorities bearing in mind that local authority boundaries may run through firths and channels, as may national boundaries for example in the North Channel and the Solway Firth.
- 4.13 Elevated viewpoints, for example those on coastal walks and from hilltops along firths are particularly useful in exploring layout and design, of turbines and arrays of floating structures.
- 4.14 Review of the relevant Landscape Character Assessment may assist in choice of viewpoints. Selection should be informed by the individual ZTV, as well as the cumulative ZTV. Although it is possible to add supplementary viewpoints as part of a cumulative VIA, it is preferable to use all or some of the same viewpoints for both the individual and cumulative VIA.
- 4.15 ***Visual Representation of Windfarms: Good Practice Guidance, 2007*** advises on viewpoint selection, so that the representative range of viewers and visual receptors is covered. In assessing all offshore renewables additional consideration needs to be given to:
- Coastal views looking out from the coast and back to it, as well as across water to and from opposing shores;
  - Lighting conditions need to be assessed and will assist in design development and assessment. This will also enable assessment of a range of light conditions e.g. side-lit, back-lit and front-lit;
  - The variety of images that the wind, wave or tidal farm will present from:
    - coastal areas and important coastal hilltops;
    - the coast, and within firths and straits,this will comprise views where all turbines or the extent of arrays are visible, as well as where partial views occur;
  - A range of elevations to illustrate views: looking up to turbines and elevated structures – as from a beach or ferry; looking out at the same level as turbines or across to floating structures – from say a clifftop walk; and looking down on turbines or other floating structures – from a coastal hilltop;
  - Aerial views of offshore renewables, where they lie on a principal low-level flightpath approach to a major terminus, in effect a ‘gateway’ approach to a regional centre.

- 4.16 In any assessment for offshore renewables, the viewer types noted in SNH's *Visual Representation of Windfarms* should be supplemented with those moving through the landscape, across ferry and popular recreational sailing/kayaking routes.

## Visualisations

- 4.17 It can be very difficult to reconcile a visualisation, or even a photograph, to an actual on-site view comprised largely of open sea and sky. In these cases, where possible, the land edge to one side of view should be included (which typically makes for very wide horizontal field of view). Modelling other offshore features, for example a rig, marker buoy, or lighthouse may provide a helpful locator on the wirelines.

## Evaluating the impacts

- 4.18 The *SNH Seascapes study (2005)* describes the sensitivity of seascape units. The seascape units were tested against one theoretical windfarm scenario to explore issues of sensitivity and visibility, but this part of the work is **not valid for the range of current development types** and should not be used. Furthermore, the study was limited to a strategic desk-based approach where fieldwork was not a major part of the assessment process (see the *Seascapes* report section 2.8.2.). Thus, these seascape units are of only limited use in appraising real development proposals. Indeed, **fieldwork is a fundamental part of any SLVIA.**
- 4.19 The SNH Seascapes study (2005) highlights various 'specific' conditions relating to our coast and environment. These need to be considered in tailoring a methodology for the SLVIA, principally in respect of visibility (see sections 4.7.4 to 4.7.5 of the report and its Annexe B).
- 4.20 The basis upon which all aspects of the SLVIA are to be assessed, especially judgements of magnitude, sensitivity and significance should be defined and made clear and distinct. Measures of magnitude should distinguish between the scale, nature, and duration of effects. The GLVIA offers guidance on this aspect of the assessment. The limitations of the assessment (e.g. the scale or accuracy of topographical information) should be clearly stated.

## 5

### Layout and design

- 5.1 The options for the siting and layout of offshore renewables will be constrained by regulatory, navigational, environmental, social and technological demands, in addition to landscape and visual aspects. These will be demonstrated through the ES. One of the main purposes of the EIA process is its iterative role in influencing and improving design. Relevant guidance is found in Planning Advice Note 68: Design Statements<sup>22</sup>.
- 5.2 While the technical and design constraints on offshore renewables are more challenging than onshore, some aspects of their visual design may seem easier because:
- the horizontal plane of the sea is visually simpler than landform,
  - marine renewable installations tend to be installed in lines, as an ‘array’ or on a grid.
- Overall, good design principles should be explored. The design sequence and key changes through the process should be clearly explained in the ES as should the reasons for adopting a particular layout. The design iterations should apply basic design principles, relating to the massing or grouping of devices within a licence area, and the design of multiple and adjacent renewables developments (including extensions). This preliminary stage can examine visibility issues and is discussed in section 7.
- 5.3 Where there is uncertainty about the final project design details, applicants may use the so-called ‘Rochdale envelope’ approach. Where this is the case, then greater clarity is needed on the assessment process and the outputs from it. The ES must present the ‘clearly defined parameters’ within which the offshore renewables proposal will take place.<sup>23</sup> It is best if developers adopt a consistent approach to the assessment and its outputs (including presentations and visualisations) – particularly for cumulative assessment – **see Section 7** in this document. **Annexe 2** presents a Marine Scotland/SNH Advice Note on the recommended outputs, specifically for Offshore Windfarms.

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<sup>22</sup> [Planning Advice Note 68: Design Statements](#), August 18, 2003

<sup>23</sup> ‘Rochdale Envelope’ is an approach to considering applications when details of the whole project are not available at the time the application is submitted. See : [Infrastructure Planning Commission advice note nine](#).

## Characteristics of offshore windfarms

5.4 Although the principles developed for onshore windfarms (outlined in [Siting and Designing windfarms in the landscape \(2009\)](#)<sup>24</sup>) are relevant, they must be tailored for offshore windfarms. This is because the general characteristics of windfarms offshore, differ to those onshore as follows:

- Greater turbine numbers –marine proposals can include 100s of turbines; sometimes with adjacent areas subject to further leasing rounds, with the result that windfarms may ‘read’ as one extensive development,
- Extensive layouts – development proposals are not concentrated in layout; with turbines generally spaced 500m apart or thereabouts, they cover larger areas, for example up to 150km<sup>2</sup>; generally, the larger the diameter of the blades, the greater the distance between turbines,
- Larger-sized turbines, 130m+ to blade tip,
- Offshore transformer stations that may be similar in appearance to a small offshore production platform,
- Viewing experience – turbines are commonly seen in relation to the simple, often wide, horizontal sea-surface, sky and the horizon,
- Viewing proximity – near-distance views of them, at less than 3km, will be restricted and the majority of views and viewers will be at greater distances.

5.5 SNH’s [Siting and Designing windfarms in the landscape](#) explores layout and design issues in relation to onshore windfarms. Basic design principles are relevant:

- Turbine form, design, size and colour,
- Turbine layout/array,
- Lighting,
- Turbine grouping, relationship to scale-indicators and focal points, especially when viewed in relation to land – be it an island, coastline or backdrop across a firth.

5.6 For offshore windfarms additional considerations include:

- How they relate to the coast, their position within a channel, or firth
- How the height of turbines relates to other coastal elements or features, for example power station chimneys, prominent focal hills or mountains
- Whether they will be backclothed by sea or land

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<sup>24</sup> [Siting and Designing Windfarms in the Landscape](#). SNH, (2009). superseding the ‘Guidelines on Environmental Impacts of Windfarms & Small Scale Hydroelectric Schemes’ (2001).

- Their scale if positioned within a firth on a major searoute, or on a tourist/transport route
  - How they relate, as a new focal feature, to their surroundings – for example, by replacing the value of existing landmarks.
  - How they will be viewed from settlements on the coast, as well as those that enjoy an ‘outer’ marine backcloth.
- 5.7 Compatibility between adjacent windfarm designs where they appear within a ‘wider view’, or panorama, is important. This consideration will include both onshore and offshore windfarms where they appear together in one view, or sequentially (see Cumulative section).

## Characteristics of Wave and Tidal Devices

- 5.8 Wave and tidal devices vary in shape and size, and lie either on the sea surface, partially submerged, or completely submerged. Some tidal devices have low towers for raising both the turbines and their accompanying power units above sea-level, to permit maintenance access. These towers are smaller in height than wind turbines (as an example 40.7m above the seabed). Most wave devices are located on the sea surface, and raised to only a limited height above the water. The most common type of wave energy converter is the attenuator, formed by a series of interconnected tubes floating on the water surface, and riding waves parallel to the wave/swell direction.
- 5.9 Indications are that these devices will be installed in arrays, or in a grid pattern (in the case of floating buoy systems). These may extend over a considerable surface area and will require a LVIA proportionate to the likely impacts. This means for example, that the number of viewpoints, visualisations and extent of study area should be tailored to test the extent and nature of visibility, together with the range of likely sensitivities. On request, SNH will advise on the scope of required assessment, so that it is helpful and illustrative of likely impacts.
- 5.10 Individual wave energy converters and tidal energy converters are brightly painted for navigational reasons. They may be unlit, however when necessary for navigational reasons, they are lit with yellow flashing lights, so as to be sufficiently distinct from any buoys around the field extremity, up to a range of at least 2 nautical miles. The field containing the arrays/grid of devices will be marked around its extremity with navigation buoys and lights, so as to be visible from all directions of approach. This may mean that the field is marked on only the cardinal points (the northernmost, southernmost, easternmost and westernmost) but if the field is extensive intermediate marks are necessary between the cardinal points. Further details including the lighting and marking requirements are given in [Navigation in the Vicinity of Offshore Renewable Energy Installations. Steamship Mutual – RE 02 Loss Prevention Bulletin](#).
- 5.11 In considering the layout and design of wave and tidal devices, understanding the character of the coast and landscape, and how it is experienced are important first stages in:

- planning the layout and scale of the development, which will include onshore structures as well as the devices themselves,
- positioning both the onshore structures and tidal/wave devices,
- aligning the devices,

5.12 Guidance on [The siting and design of aquaculture in the landscape](#)<sup>25</sup>, although developed for marine aquaculture, outlines the main considerations when siting and aligning water-based structures and onshore facilities. Many of the principles outlined in this guidance, apply where similar marine characteristics and conditions predominate, for example the principles outlined for steep sided enclosed lochs may be applied to developments within narrow sea-sounds. The example below adapts this methodology by applying it to Narrows. Note that ‘narrows’ are a local coastal character type within the national-scale coastal character type (see SNH Seascapes study (2005), Type 9: Sounds, narrows and islands p.177-178).

<b>STEEP SIDED, ENCLOSED NARROWS</b>		
<b>Key characteristics</b>	<b>Design Implications</b>	<b>Guidance</b>
<ul style="list-style-type: none"> <li>• Coastline dominated by <b>steep mountain sides</b>, plunging into sea, creating a sense of drama</li> <li>• Steep sided topography <b>creates dense shadow</b>, when calm weather there are <b>distinct reflections</b></li> <li>• Landscape characterised by <b>sense of enclosure</b>, emphasised by the verticality of the surrounding landforms</li> <li>• Views are concentrated <b>along the length of, or directly across</b> the strait, rather than along the hill tops</li> <li>• The coastline is <b>relatively simple</b>, with few indentations</li> <li>• Roads approach the narrows over high passes, <b>giving elevated views</b>. Or are tucked</li> </ul>	<p>In the Narrows, the simplicity, scale and expanse of the water is important.</p>	<p><b>Size of the development should reflect the scale of the water surface.</b></p> <p><b>Maintain the integrity of the central seaway</b></p> <p><b>Consider appropriate ‘separation’ distance between the simple coastal edge and devices.</b></p>
	<p>Too many water-based structures or one large development will quickly lead to over-crowding, and divert views away for the central seascape.</p>	
		<p>Due to high, steep sides, Narrows are in deep shadow for much of the day.</p>
	<p>Structures sited across the Narrows may fragment and subdivide it, breaking up the simple expanse</p>	<p><b>Align devices along the length of the Narrows, not across it</b></p>

<sup>25</sup> [The siting and design of aquaculture in the landscape: visual and landscape considerations. SNH November 2011.](#) takes account of changes in technology and industry practice since the 2000 edition.

<p>along the shore, constrained by the steep landform so that <b>low-level views predominate.</b></p> <ul style="list-style-type: none"> <li>• <b>Focal point</b> and key view points in the landscape formed by Ferry/crossing point; <b>views directly across the strait important.</b></li> </ul>	<p>Coastal edge simple in shape, development may 'complicate' the simplicity</p>	<p><b>Site devices so that they reflect this characteristic and attempt to replicate the simple, linear line of coast</b></p>
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5.13 In considering the layout and design of wave and tidal devices, a good starting point is to consider the coastal character and what is required in terms of layout and design. However, this provides a starting point and developers should also consider that:

- Some locations may have characteristics which are in more than one landscape category, thereby guidance from the relevant categories should be considered
- The scale of proposed wave or tidal devices is greater than that for aquaculture

## 6

### Siting and design

- 6.1 The siting of offshore renewables depends largely on the best resource location – winds, waves and tides. Nevertheless, any project design should aim to incorporate good design principles. In general terms:
- sites in inshore waters will have greater seascape, landscape and visual impacts than those further out to sea,
  - simple, open, flat coastlines will visually accommodate windfarms better than complex coastal landscapes, especially those with inlets and islands,
  - small arrays of wave and tidal devices will have less visual impact than high vertical structures or spatially extensive, installations.

### Valued and designated areas

- 6.2 A seascape, coast and landscape may be valued for many reasons, such as its quality, scenic beauty, tranquillity or wildness, recreation opportunities, nature conservation, its historic or cultural associations. Offshore renewables will not necessarily be incompatible with these qualities, but this will depend on the development itself and the qualities for which the place is valued.
- 6.3 Scotland's coast is highly regarded in terms of its diverse character and also for the recreational activities it offers. Scottish Planning Policy (SPP)<sup>26</sup> pays regard to its international and national importance, and the need to ensure sustainable development through coastal and marine planning as well as in Development Plans.
- 6.4 National Scenic Areas (NSAs) are Scotland's only nationally designated landscapes.<sup>27</sup> Of 40 NSAs covering 12.7% of Scotland, 27 NSAs include coastal landscapes and seascapes which lie predominantly on/off the west and north-west coasts. These include seascapes, coastline, islands and island-scapes, isolated coast and coastal wild land search areas. The experience of many of these NSAs from the sea is important.
- 6.5 Recent work by SNH has developed a more systematic, transparent and robust approach to defining the special qualities that make each of these nationally important areas special. 'Special qualities' are here defined as the characteristics that individually, or when combined together, make an NSA special in terms of landscape and scenery. This work will be useful in

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<sup>26</sup> A statement of the Scottish Government's policy on nationally important land use planning matters February 04, 2010. See para. 98-103

<sup>27</sup> Described in [Scotland's Scenic Heritage](#), 1987

understanding the qualities that make these areas of seascape and coastal landscape of value<sup>28</sup>.

- 6.6 Areas of coastline and islands may also be designated as a National Park, Regional or Country Park, National or Local Nature Reserve or a Local landscape designation, such as Areas of Great Landscape Value (AGLV).

### **Wild land, remoteness and dark skies**

- 6.7 Less than 15% of our coastline is developed, thus qualities of remoteness and tranquillity are especially relevant to our coast. This is duly acknowledged in Scottish Planning Policy which refers specifically to coastal planning, and the sensitivity of the isolated coast (see paras. 98; 100; 102).
- 6.8 Some areas outwith designated areas possess 'wild land' qualities. No detailed mapping of these areas has been done, although recently SNH has undertaken an analysis of where 'wildness' can be found across the country, and has mapped the relative occurrence of these qualities ([Mapping Scotland's wildness](#)). The latest mapping does not look at coastal areas in detail; this work will follow in due course. These issues need consideration in the siting and design of offshore renewables. **See Annexe 1: Other Guidance and Information.**
- 6.9 As with wildness, remoteness and tranquillity, dark skies are an experiential quality appreciated by many people which lend distinctive qualities to our landscapes. Scotland possesses some of the largest areas of dark sky in Europe. They occur in rural areas, free from urban light pollution – a principal characteristic of much of our coastline. Dark Sky Scotland is a partnership led by the Royal Observatory Edinburgh. Dark Sky Discovery Sites are officially recognised for their low levels of light pollution and good public access. To date those identified include sites in [Skye and Lochalsh, Lochaber and Moray](#).

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<sup>28</sup> [See :National Scenic Areas: Special Qualities](#)

# 7

## Cumulative effects

### Background

7.1 The considerable interest in offshore renewables is leading to multiple proposals for schemes at the same time, some in proximity to one another. The result of this is that windfarms and wave / tidal devices will be assessed for EIA in parallel. This presents both a challenge (due to the volume) and opportunity (due to the timing) for developers to work together on cumulative assessments, as many will be at roughly the same stage in the process. Cumulative Seascape, Landscape and Visual Impact Assessment should be carried out with reference to the GLVIA<sup>29</sup> and to SNH guidance [Cumulative Effect of Windfarms. 2005](#)<sup>30</sup> which set out the background for this aspect of assessment. This guidance introduces:

- An understanding of what constitutes a cumulative impact.
- The scope of a cumulative impact assessment.
- The different forms of cumulative impact which can occur.

The **cumulative effect** of a set of developments is:

- the combined effect of all the developments, taken together; that is a development with other types of the same development – for example, wind farms and other wind farms;
- or
- the effect of a development in combination with other, different projects and activities – for example, wind farms in combination with aquaculture, or in combination with oil rigs.

7.2 Although initially compiled in response to onshore windfarm developments, the basic assessment methodology is the same. What differs is the degree of impact that these different technologies have, therefore the methodology will need to be tailored to according to the technology and scale of development.

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<sup>29</sup> The Landscape Institute and the Institute of Environmental Management and Assessment, (2002) *Guidelines for Landscape and Visual Impact Assessment*. Second edition, Spon press. (LI-IEMA, 2002)

<sup>30</sup> [SNH Guidance. Cumulative Effects of Windfarms](#). Version 2, revised 13.04.05

- 7.3 Cumulative impacts are likely to arise from an offshore windfarm in conjunction with:
- other onshore windfarms – those in operation, approved and in the planning system
  - an offshore windfarm nearby, for example where they lie across an outer firth or alongside a major sea-channel or strait
  - within individual lease areas, where the grouping of large turbine numbers could read as an individual windfarm and in extensions to existing offshore windfarms.
- 7.4 Where multiple wave and tidal devices are intervisible alongside existing or consented renewable devices, then these too will be subject to a cumulative assessment, for instance within a strait or firth.
- 7.5 Many other activities may combine with an offshore renewable development to affect the character of a seascape, coastal landscape, firth or island.

Other projects and activities could produce cumulative effects with marine renewable developments and include:

- Offshore windfarms
- Waterfront and coastal development
- Aquaculture
- Cable and pipelines
- Oil and gas infra-structure
- Marine aggregate extraction
- Dredging and sea disposal
- Tourism and recreation

## **Method Statement for Cumulative Seascape, Landscape and Visual Impact Assessment**

- 7.6 In cases where proposals are to be developed in close proximity, developers are encouraged to work collaboratively during the early stages of project development to:
- Identify cumulative effects
  - Agree a specification for the assessment
  - Establish the base plan of all public domain proposals that forms the baseline
  - Agree the baseline and range of issues in agreement with consultees and stakeholders.
- 7.7 All parties are encouraged to agree a joint scope of works, approach and presentation of results, ensuring that visualisations and other material are produced on a consistent basis (in terms of both content and quality). A Method

Statement for the Cumulative SLVIA can set this out, as agreed between parties. It should include:

- Relevant baseline information
- The method used to assess cumulative effects
- The range of cumulative material to be prepared
- A common format for presenting findings.

7.8 As with SLVIA for an individual marine renewable proposal, commissioning an independent landscape architect to undertake the cumulative assessment should aim to

- secure the agreed range of information,
- tailor the accepted methodology of Landscape and Visual Impact Assessment assessment (as presented in the GLVIA) to the specific technology
- prepare visualisations to the current standards outlined in ***Visual Representation of Windfarms: Good Practice Guidance, 2007.***

7.9 The aim is to assist developers, decision makers, consultees members of the public and other interested parties by providing a clear and common understanding of the predicted effects of a proposal, in an impartial and professional way. As an aid towards achieving this MS and SNH have issued guidance of the recommended outputs to present **See Annexe Two – Marine Scotland/SNH Advice Note: Offshore Windfarm Landscape / Seascape, Visual and Cumulative Assessment. Recommended Outputs.**

## **Strategic cumulative assessment**

7.10 At the outset, a strategic assessment is important. This will give an overview of the relationship of the marine renewable developments:

- to onshore renewable developments and
- in combination with other marine developments.

SNH's "Cumulative effects of windfarms" guidance highlights the need to be aware of cross-boundary issues in relation to the strategic cumulative assessment. It should consider *'the whole of a region, straddling more than one planning authority, or that of a natural heritage management unit such as a National Park or Firth Partnership area.'* (para 23). This is especially relevant in the case of offshore renewables where national borders and administrative boundaries frequently cut through coastal areas and firths.

7.11 Further important strategic considerations for **offshore windfarms** are:

- to examine the proposed scale, height and spread of all developments – does the proposal extend turbine-visibility into separate and disparate landscape regions usually experienced as very different, distinct regional landscapes; (where, for example, they are separated by locally elevated landform),
- to analyse the existing trends or patterns of consented renewable development that respond to regional landscape character (for example, larger developments on plateau tops, medium scale developments on smaller hill ridges, small clusters and single turbines within agricultural landscapes) – examine whether this pattern is visually maintained, interrupted or linked to the proposed off-shore development;
- to consider whether the offshore developments have the potential to visually, and therefore cumulatively, link a much wider extent of on-shore developments than is currently experienced due to on-shore renewables alone
- to look at where the off-shore developments introduce turbines into a completely new part of any panorama or view, typically in the opposing direction to existing/consented on-shore developments.
- to review whether the offshore developments create a cumulative effect by encircling a landscape/visual receptor, thus highlighting the need to assess coastal routes.

7.12 Further important strategic considerations for **wave and tidal schemes** will depend on whether the presence of equipment/installations on the sea surface is temporary (for construction/maintenance purposes) or operational. Considerations are:

- to examine the proposed scale, height, colour and spread of all surface and above surface, operational installations – does the proposal extend across separate and distinct coastlines, usually experienced as very different, distinct areas spatially and visually; for example, across bays, sea straits or across the outer and inner reaches of a firth ?
- how does the proposal relate to existing trends or patterns of consented renewable development and other marine infrastructure like aquaculture; do they both respond to regional coastal character in terms of siting and configuration ?
- to consider whether surface operational schemes have the potential to visually, and therefore cumulatively, link a much wider extent of marine and shoreline development than is currently experienced
- to look at where the schemes introduce on/above surface structures into a completely new part of any panorama or view, typically in the opposing direction to existing/consented on-shore developments.
- to review whether the offshore developments create a cumulative effect by encircling a landscape/visual receptor, thus highlighting the need to assess coastal routes.

- 7.13 As such the scope of the offshore cumulative assessment may, by taking into account a number of these factors and regional patterns, have to be extended by agreement with consultees.

## Design issues

- 7.14 Design of adjacent schemes should be resolved through an iterative EIA process, ensuring that the schemes are complementary and respect design principles. SNH guidance *Siting and Designing windfarms in the landscape*, outlines basic principles of planning and accommodating multiple onshore windfarms (in section 5). Some are relevant to offshore renewables and include where it is important to:

- Design new developments to integrate with the preceding one(s), provided the initial developments correspond reasonably well to their surroundings.
- Balance developments of a similar design and image, to limit visual confusion,
- Establish new patterns and scales of installations that respect their surroundings; for example, where developments are situated across an outer firth consideration should be given to their grouping and mass, taking into account their visual scale within the surrounding seascape/landscape and their backdrop
- Cumulative design from key views which are assessed as having a high sensitivity

# 8

## Consultation to achieve Best Practice

- 8.1 SNH do not have a specific offshore wind energy policy. Offshore wind development is covered by our overarching **Renewable Energy Policy Statement** and in **Marine renewable energy and the natural heritage: an overview and policy statement**.<sup>31</sup>
- 8.2 In the absence of existing guidance specific to scoping offshore renewables for EIA, this advice note aims to offer a structured approach to assessing a marine renewable development. It highlights existing guidance that is relevant and useful to consider when locating and designing offshore wind, wave or tidal schemes. Many principles established and accepted as good practice for the siting and designing of onshore windfarms, and for aquaculture developments can be useful in the assessment and design process of offshore renewables.
- 8.3 We encourage pre-application discussions as these can be useful in guiding developers, local authorities and consultees to relevant sources that can inform our knowledge of our specific coastal, landscape and 'seascape' environment. These discussions are also useful in determining how guidance can be tailored to the specifics of both development and environment in question. Initial enquiries relating to offshore wind and marine renewables can be sent to the SNH mailbox: [marinerenewables@snh.gov.uk](mailto:marinerenewables@snh.gov.uk).

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<sup>31</sup> [Offshore wind energy - Scottish Natural Heritage](#)

## OTHER GUIDANCE AND INFORMATION

### **Establishing baseline conditions**

Initial desk based study may help to inform fieldwork assessment of coastal character. The following sources will be useful.

- ***Landscape Character Assessment Reviews. Scottish Natural Heritage (1996-1999).***

These Landscape Character Assessment Reviews, available from SNH publications, include coastal areas, although the level of detail varies, most are at 1:50,000 scale: Nos 37, 712, 78, 90, 91, 92, 93, 94, 97, 100, 101, 102, 103, 111, 112, 113, 119, 122.

- No.113 Fife Landscape Character Assessment, David Tyldesley Assoc., for SNH (1990) – covers coast and shoreline at 1:25,000 scale with detailed description of coastal characteristics.
- Benson, JF, Scott, KE, Anderson, C, Macfarlane, R, Dunsford, H. And Turner K., (2004). *Landscape Capacity Study for Onshore Wind Energy Development in the Western Isles*. Scottish Natural Heritage Commissioned Report No. 042 (ROAME No. F02LC04). This refines the existing LCA No 92 to take account of coastal areas.  
[http://www.snh.org.uk/pdfs/publications/commissioned\\_reports/ReportNo042A.pdf](http://www.snh.org.uk/pdfs/publications/commissioned_reports/ReportNo042A.pdf).

Existing **Aquaculture Guidance** guidance for Siting and Design, as well as Capacity studies are useful in coastal characterisation.

- ***The siting and design of aquaculture in the landscape: visual and landscape considerations. Scottish Natural Heritage, November 2011.***

This guidance considers the wide range of aquaculture developments, and current trends in siting and technology. It offers advice on how to assess and address the landscape and visual impact of marine aquaculture developments and aims to ensure that those involved in aquaculture developments are well informed on landscape issues, providing a clear framework for making positive decisions about the siting and design of both onshore and marine based facilities.

It is relevant to offshore renewables in stating:

- the need to identify locations for development which make the most of landscape opportunities,
- the need for development to respect the diversity of landscape character and sustain the qualities which reinforce experience of place.
- How the nature of Scotland's coastline means that near-shore development is often highly visible, either from land or sea.
- The importance of visibility, whether in relation to classic vistas, or as a contribution to the experience of place, cannot be underestimated.

- Any coastal development and infrastructure should be well enough sited and designed to fit in with the surrounding character and contribute to a lived in landscape.

- **Guidance on Landscape/Seascape Capacity for Aquaculture . Scottish Natural Heritage, 2008.**

Outlines the methodology of

- coastal character assessment defining a single loch, a whole island or stretch of coastline with a consistent overall character, and
- defining local coastal character areas

- **The Beaches of Scotland series:** gives some relevant background to Scotland's coasts. Although information on some aspects, like recreation, is now dated, these regional reports offer a quantified description of many aspects of Scotland's coastline. Available from SNH publications:

Beaches of Sutherland	1969	W. Ritchie and A.S. Mather
Beaches of Caithness	1970	W. Ritchie and A.S. Mather
Beaches of Lewis & Harris	1971	A.S. Mather and W. Ritchie
Beaches of Barra & the Uists	1971	W. Ritchie
Beaches of West Inverness-shire & North Argyll	1972	A.S. Mather and R.S. Crofts
Beaches of Wester Ross	1972	R.S. Crofts and A.S. Mather
Beaches of Mainland Argyll	1973	W. Ritchie and R.S. Crofts
Beaches of Easter Sutherland & Easter Ross	1973	J.S. Smith and A.S. Mather
Beaches of Orkney	1974	A.S. Mather, W. Ritchie and J.S. Smith
Beaches of Shetland	1974	A.S. Mather and J.S. Smith
Beaches of Islay, Jura & Colonsay	1974	W. Ritchie and R.S. Crofts
Beaches of the Northern Inner Hebrides	1975	A.S. Mather, W. Ritchie and J.S. Smith
Beaches of Cowal, Bute & Arran	1975	W. Ritchie
Beaches of Northeast Scotland	1978	W. Ritchie, N. Rose and J.S. Smith

In addition, a review volume *The Beaches of the Highlands and Islands of Scotland* (A.S. Mather and W. Ritchie) CCS, 1977.

**JNCC's Coastal Directories.** This project, co-ordinated by JNCC on behalf of a wide-ranging funding consortium, collates extensive baseline environmental and human use information, including fisheries, for the coastal and nearshore marine zone of the whole of the UK. Designed to meet the needs of planners and coastal zone managers and users, they offer a useful starting point for understanding coastal landscapes and landforms. Relevant volumes are:

Barne, J.H. et al, (1997), Region 1. Shetland,  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region01.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region01.pdf)

Barne, J.H. et al, (1995), Region 13. Northern Irish Sea: Colwyn Bay to Stranraer, including the Isle of Man,  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region13.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region13.pdf)

Barne, J.H. et al, (1997), Region 14. South-west Scotland: Ballantrae to Mull  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region14.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region14.pdf)

Barne, J.H. et al, (1997), Region 2. Orkney  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region02.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region02.pdf)

Barne, J.H. et al, (1996), Region 3. North-east Scotland: Cape Wrath to St Cyrus  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region03.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region03.pdf)

Barne, J.H. et al, (1997), Region 4. South-east Scotland: Montrose to Eyemouth  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region04.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region04.pdf)

Barne, J.H. et al, (1997), Regions 15 & 16. North-west Scotland: the Western Isles and west Highland  
See: [http://www.jncc.gov.uk/PDF/pubs\\_csuk\\_region15.pdf](http://www.jncc.gov.uk/PDF/pubs_csuk_region15.pdf)

The following web sites will assist in a good understanding of specific coastal landscapes and key sites:

#### **Orkney**

Hall, Adrian and Brown, John *Orkney Landscapes [online] [Edinburgh, Scotland]* September 2005, updated 29-Apr-2010.  
See: <http://fettescom.site.securepod.com/orkney/about%20this%20site.htm>

#### **Shetland**

Hall, Adrian and Fraser, Allen *Shetland Landscapes [online] [Edinburgh, Scotland]* August 2004, updated 27-Oct-2009  
See: <http://www.landforms.eu/shetland/about%20this%20site.htm>

#### **Caithness**

Hall, Adrian *Caithness Landscapes [online] [Edinburgh, Scotland]* January 2006, updated 29-Oct-2009  
See: <http://www.landforms.eu/Caithness/about%20this%20site.htm>

The SCAPE Trust aims to research, conserve and promote archaeology on our coasts. Defining the 'coastal zone' is difficult, but generally, SCAPE is interested in all archaeological sites and historic landscapes that have either a proximity to, or relationship with, the coast. SCAPE have undertaken Coastal Zone Assessment Surveys, available on-line for:

<a href="#">Angus</a>	<a href="#">Lewis</a>
<a href="#">Barra and Vatersay</a>	<a href="#">North Sutherland</a>
<a href="#">Coll and Tiree</a>	<a href="#">North Uist</a>
<a href="#">Colonsay</a>	<a href="#">North Uist (East coast)</a>

<a href="#">East Lothian and Scottish Borders</a>	<a href="#">Orkney</a>
<a href="#">Fife</a>	<a href="#">Shetland</a>
<a href="#">Firth of Clyde</a>	<a href="#">Solway North</a>
<a href="#">Firth of Forth South</a>	<a href="#">South Uist, Benbecula and Grimsay</a>
<a href="#">Inner Moray</a>	<a href="#">South Uist and Benbecula (East coasts)</a>
<a href="#">Islay</a>	<a href="#">Ullapool - Lochinver</a>

For further information see: <http://www.scapetrust.org/html/html/about.html>

Some local authorities have adopted specific coastal strategies,, these may help to establish the baseline characteristics, experiential characteristics as well as any relevant designated areas.

- ***Highland Coastal Development Strategy. The Highland Council, May 2010.***

NPPG 13, published in 1997, advised Scottish local authorities to classify their coasts using three broad categories: “Developed”, “Undeveloped” and “Isolated”. <http://www.highland.gov.uk/yourenvironment/planning/coastalplanning/classificationofthehighlandcoast>

### **Valued and designated areas**

- ***The special qualities of the National Scenic Areas. SNH Commissioned Report No.374. (2010).***

40 National Scenic Areas (NSAs), with their outstanding scenery, represent Scotland's finest landscapes. Designated under Section 263A of the Town and Country Planning (Scotland) Act 1997, NSAs are defined as “of outstanding scenic value in a national context.” The legislation also states that within an NSA “special attention is to be paid to the desirability of safeguarding or enhancing its character or appearance.” Most new developments within NSAs need to be accompanied by a design statement, and there are restrictions on certain permitted development rights.

The NSAs cover 13% of the land-area of Scotland. 27 of them include coastal landscapes and seascapes. Within these, the experience from the sea is fundamental in appreciating their scenic value. Recent survey of all NSAs, produced an up-to-date list of the landscape qualities that make each one special. These ‘special qualities’ are defined as the characteristics that individually, or when combined together, make an NSA special in terms of landscape and scenery.

See <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/nsa/nsa>

- ***Assessing The Impacts On Wild Land. Interim Guidance Note February 2007***

Our diverse coastline retains many isolated sections of the coast and uninhabited islands, as well as remote coast, lying beyond modern day development, infrastructure and roads. Some of these areas best harbour the sense of 'wildness', as well as being remote and scenic. Our western and northern coastal waters offer high quality sailing, with active outdoor pursuits such as walking, climbing, fishing, sailing, canoeing, or wildlife watching – indeed, any recreation or pastime which draws people into the remoter and more challenging areas of land or coast. This guidance draws on SNH Policy statement on Wildness.

This interim guidance note outlines the general principles for assessing the potential impacts on areas where wildness is best expressed (wild land), including an assessment methodology. This parallels the staged methodology of the GLVIA.

**See:** SNH. *Assessing The Impacts On Wild Land. Interim Guidance Note. February 2007.* See <http://www.snh.gov.uk/docs/B464997.pdf>

- ***Philip's Dark Skies Map Britain and Ireland, 2004***

"Philip's Dark Skies Map" shows the visibility of stars from locations in Britain and Ireland. It is published in association with the British Astronomical Association's Campaign for Dark Skies, an organization campaigning to protect and improve our view of the night sky. The map uses data from the Light Pollution Science and Technology Institute in Italy, indicating the different levels of light pollution.

**ADVICE NOTE**


T: +44 (0)1224 295579 F: +44 (0)1224 295524  
E: [MS.MarineLicensing@scotland.gsi.gov.uk](mailto:MS.MarineLicensing@scotland.gsi.gov.uk)



## **Offshore Windfarm Landscape / Seascape, Visual and Cumulative Assessment**

### **Recommended Outputs**

#### **Introduction**

We provide this list of recommended outputs for landscape / seascape, visual and cumulative assessment because the use of “Rochdale Envelopes”<sup>32</sup> for offshore wind development means that greater clarity is needed on what will be produced. It is desirable for developers to adopt a consistent approach to the assessment and its outputs (including presentations and visualisations) – particularly for cumulative assessment.

Developers should produce a Method Statement that sets out their approach to landscape / seascape and visual assessment. For cumulative assessment, we recommend appropriate collaboration between the relevant developers including their joint agreement of the Method Statement. The Method Statement will define how each of the following requirements are to be addressed and analysed. It should refer to the advice provided in Marine Scotland scoping opinions and SNH scoping responses; and to relevant guidance from SNH including that on cumulative impact assessment, marine aquaculture, good practice for visualisations, and windfarm siting and design.

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<sup>32</sup> An approach to considering applications when details of the whole project are not available at the time the application is submitted.

*(Definition adapted from Infrastructure Planning Commission advice note nine).*

## Recommended Outputs

### 1. Map of search and study areas, and preliminary ZTV

The study area will be agreed by Marine Scotland in consultation with SNH and relevant local authorities.

- a) A preliminary ZTV will be helpful for this (and is essential for agreeing viewpoints).
- b) A search area of at least 60km from the edge of the proposed development, showing relevant designations and other information such as national coastal character types, can help establish a reasonable study area.
- c) Other proposals the cumulative assessment should consider will be agreed by Marine Scotland in consultation, and will be illustrated on a draft map and ZTV.

### 2. Coastal and “seascape” / landscape character assessment baseline information in agreed study area (map and text)

- a) Landscape character information shall be taken from the relevant terrestrial Landscape Character Assessment (SNH national series of LCAs).
- b) Coastal character information shall be based on national coastal character descriptions<sup>33</sup> and relevant coastal references in the terrestrial LCA.
- c) More detailed characterisation and/or subdivision, if required, will be expected to nest within this hierarchy. The scale and detail should be appropriate for the assessment.
- d) National and local landscape designations will contribute to questions of landscape sensitivity.
- e) Key characteristics should be identified, as appropriate, with respect to the proposed development. **See Table 1, page 11.**

The use of alternative methods of assessment, or consideration of far offshore or purely ‘seascape’ assessment, would need to be explained, justified and agreed at scoping stage. Given the importance of the coast and coastal areas as receptors – including their various sensitivities as a focus for settlement, transport and recreation – any work on purely marine or seascape areas is likely to be additional to what is needed for assessment of the coast and likely impacts on it.

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<sup>33</sup> Available from SNH website: <http://www.snh.gov.uk/planning-and-development/renewable-energy/offshore-wind/>

### **3. Viewpoint selection (map and text)**

- a) Viewpoints will be agreed by Marine Scotland in consultation with SNH and relevant local authorities, following the principles in the “Guidelines for Landscape and Visual Impact Assessment”.
- b) In addition, with the use of “Rochdale Envelopes”, key design viewpoints will be needed, to be confirmed by Marine Scotland in consultation with SNH and local authorities. These will be used to present the full range of design options being considered.

### **4. Baseline photographs**

The production and format of baseline photographs should be agreed and shared by developers for cumulative proposals in consultation with Marine Scotland, SNH and local authorities.

### **Rochdale Envelopes: considerations for windfarm design and illustration**

### **5. Constraints (map and text)**

The primary concept stage should set out known constraints – for example shipping lanes, ordnance banks, geology, wind resource and so on, as well as the range of potential components and layouts being considered.

### **6. Design concept (plan(s) and text)**

This is needed in order to investigate the likely impacts of different layouts (e.g. grid, offset grid, arc array). This preliminary stage can examine visibility issues. The assessment process should demonstrate and be able to explain why a particular layout is likely to be selected.

### **7. Visualisations for design viewpoints (photomontages, wirelines, photographs)**

For each design viewpoint, the agreed range of layouts should be appropriately illustrated.

### **8. Worst case scenario**

In compliance with EIA regulations, the worst case scenario should be assessed and illustrated. What constitutes “the worst case” shall be discussed and agreed with Marine Scotland in consultation with SNH and relevant local authorities. If desired, additional assessment and illustration of other scenarios (e.g. different turbine heights or arrays) may be provided.

## **9. Post-consent process**

Final visualisations, to agreed standard and format, from a list of agreed viewpoints, will be provided for the final layout and windfarm design. These are for statutory consultee comments and public information. They will be provided to a timescale to be agreed.

Marine Scotland will provide further advice on post-consent requirements.

## ANNEXE 3

### REFERENCES

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The Landscape Institute and the Institute of Environmental Management and Assessment. (2002) *Guidelines for Landscape and Visual Impact Assessment.* Second edition, Spon press.