

CHAPTER 6: EIA PROCESS

INTRODUCTION

- 6.1. This chapter sets out the process that has been followed in undertaking the EIA for the Seagreen Project and in preparing this ES. It also discusses the process surrounding the HRA, as well as the production of future Decommissioning Plans. This chapter should be read in conjunction with other relevant chapters of the ES.
- 6.2. It should be noted that the approach to EIA specified in this chapter is applicable to all aspects of the Seagreen Project as detailed in Chapter 5: Project Description of this ES.
- 6.3. All figures referred to in this chapter can be found in ES Volume II: Figures. All appendices referred to in this chapter can be found in ES Volume III: Appendices.

REQUIREMENT FOR EIA

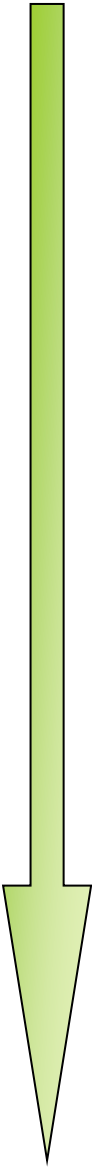
EIA Legislative Framework

- 6.4. The EC EIA Directive (2011/ 92/ EU) (EC, 2011) (EIA Directive) requires that an EIA must be carried out in support of an application for consent for certain types of major projects. A list of such projects are given in Annex I and Annex II of the Directive.
- 6.5. Under the EIA Directive, an EIA is required for all projects listed under Annex I; Annex II projects may require an EIA depending on a number of factors. OWF developments are listed under Annex II as “installations for the harnessing of wind power for energy production (wind farms)”.
- 6.6. Annex II projects require an EIA to be undertaken where the project is “likely to have significant effects on the environment by virtue of factors including their nature, size or location”.
- 6.7. The EIA Directive has been transposed into Scottish law through a number of different regulations. In relation to the Seagreen Project, the EIA Directive is applied through the following regulations:
 - The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000, as amended by The Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008 (where applicable); and
 - The Marine Works (Environmental Impact Assessment) Regulations 2007, as amended by the Marine Works (Environmental Impact Assessment) Regulations 2011 (where applicable).
- 6.8. This EIA has been carried out in accordance with both of the above regulations, collectively referred to in this ES as the ‘EIA Regulations’. The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 are not applicable as this ES is assessing offshore elements only.

EIA Regulations

- 6.9. Under the EIA Regulations, EIA is required for developments of the type listed in Schedule 1, developments listed in Schedule 2 which by virtue of their nature, size, or location are deemed likely to have significant impacts and such other development as the Scottish Government considers it necessary to require EIA. Project Alpha and Project Bravo fall under the classification of “a generating station, the construction of which (or the operation of which) will require a section 36 consent but which is not a Schedule 1 development”. As the generating capacity of each of the OWF projects will be greater than 1MW they are classed as Schedule 2 developments that require an EIA. Due to the mandatory nature of the EIA, formal screening was not undertaken and instead, the first formal submission was at the scoping stage.
- 6.10. The main stages of the EIA process are outlined in Table 6.1 overleaf.
- 6.11. Under the EIA Regulations an applicant may submit a ‘Request for Scoping Opinion’. In July 2010 Seagreen developed and submitted an EIA Scoping Report (Seagreen, 2010) which considered the elements of the Seagreen Project. The Seagreen Round 3 Offshore Wind Farm Phase 1, Firth of Forth Scoping Report can be seen in Appendix B1 of ES Volume III. The Scoping Report provided an outline description of the Seagreen Project and considered the likely environmental impacts arising from the construction, operation and decommissioning stages of the project. In particular the Scoping Report set out the proposed approach to the EIA, data gathering and impact assessments and sought a formal scoping opinion from the Scottish Government (Marine Scotland) and other statutory and non-statutory consultees.
- 6.12. A scoping opinion request was submitted pursuant to the EIA Regulations. This requested the Scottish Government to state in writing, their opinion as to the information to be provided within the ES (i.e., to provide a scoping opinion). This was received on the 28 November 2010 from Marine Scotland, on behalf of the Scottish Government and the ES has been prepared on this basis. A copy of the Marine Scotland Scoping Opinion is provided in Appendix B2 of ES Volume III.
- 6.13. Details of the all consultees responses to the Seagreen Project obtained during the scoping stage are presented in Appendix B3 of ES Volume III. These responses have been addressed in the corresponding technical chapters and considered in the design evolution of the Seagreen Project during the preparation of this ES. The engineering and design of the Seagreen Project has been developed and refined since scoping, through the iterative design process (see Chapter 3: Site Selection and Alternatives of this ES) and consequently some of the comments received at scoping stage may no longer be valid.
- 6.14. The ES has considered the likely impact of the Seagreen Project on its immediate surroundings, the wider area and its overall context. Beneficial and adverse, short and long term impacts have been considered. Where mitigation measures have been identified to either eliminate or reduce adverse impacts, these have been incorporated into the design of the Seagreen Project as far as practicable. In cases where no practical mitigation measure has been identified, the ES has highlighted remaining or residual impacts and classified these in accordance with a standard set of significance criteria (see Section ‘Significance Criteria’ of this chapter).

Table 6.1 The EIA process

Stage	Task	Aim/objective	Work/output (examples)	Public Participation and Consultation	
Scoping	Scoping study	To identify the potentially significant direct and indirect impacts of the proposed development	Targets for specialist studies (e.g. hydrodynamic studies, sediment quality)	Consultation with statutory and non-statutory consultees	
EIA 	Primary data collection	To characterise the existing environment	Background data including existing literature and specialist studies	Public participation is an important part of the planning process, in particular at the EIA and pre-application stages. Preliminary consultation with key consultees is considered important for setting the framework for consent. Consultation with statutory and non-statutory organisations and individuals with an interest in the area and the proposed development throughout the EIA process forms an integral part of the Seagreen approach to EIA.	
	Specialist studies	To further investigate those environmental parameters which may be subject to potentially significant impacts	Specialist reports		
	Impact assessment	To evaluate the existing environment, in terms of sensitivity	To evaluate and predict the impact (i.e. magnitude) on the existing environment To assess the significance of the predicted impacts		Potential adverse and beneficial impacts
		Mitigation measures			
	Environmental Statement (ES)	Production of the ES in accordance with EIA guidance Including a Non Technical Summary (NTS).	ES four main volumes: NTS Written statement Appendices Figures		
	Pre-Application Consultation	Advertising of application for licensing must occur in relation to marine licence.	Application for consent		
	Post submission	Liaison and consultation to resolve matters or representations/ objection.	Correspondence with relevant stakeholders		
	EIA Consent Decision				

EIA Guidance

- 6.15. This ES has been prepared in accordance with regulatory requirements and current general best practice together with applicable EIA guidance. Where specific guidance has been used, these documents are identified within the relevant technical chapters of this ES.
- 6.16. Further information on relevant regulations and legislation is given in Chapter 4: Legislation, Regulation, Policy and Guidance of this ES.

THE EIA PROCESS

- 6.17. EIA is an iterative tool for systematically examining and assessing the impacts and effects of the construction, operation and decommissioning stages of a development on the environment.

ES Requirements

- 6.18. Schedule 4, Part 1, of the EIA Regulations identifies information that is required to be included within the content of the ES. A summary of this required information and its location within this ES is presented in Table 6.2.

Table 6.2 Location of Information within the ES (Schedule 4, Part I)

	Specified Information (taken from the EIA Regulations)	Location in ES
1	Description of the development, including in particular:	Chapter 5: Project Description
a)	a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases;	Chapter 5: Project Description
b)	a description of the main characteristics of the production processes, for instance, nature and quality of the materials used;	Chapter 5: Project Description
c)	an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.	Chapter 5: Project Description Technical chapters 7-20
2	A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.	Chapter 3: Site Selection and Alternatives Technical chapters 7-20
3	A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:	Technical chapters 7-20
a)	the existence of the development;	Technical chapters 7-20
b)	the use of natural resources; and	Technical chapters 7-20
c)	the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment.	Technical chapters 7-20
4	A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	Technical chapters 7-20
5	A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	Non-Technical Summary
6	An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Chapter 6: EIA Process Technical chapters 7-20

6.19. Table 6.3 presents the requirements from Schedule 4, Part II of the Regulations and the location of this information within the ES.

Table 6.3 Location of Information within the ES (Schedule 4, Part II)

	Specified Information (taken from the EIA Regulations)	Location in ES
1	A description of the development comprising information on the site, design and size of the development.	Chapter 5: Project Description
2	A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.	Technical chapters 7-20
3	The data required to identify and assess the main effects which the development is likely to have on the environment.	Chapter 5: Project Description Technical chapters 7-20
4	The main alternatives studied by the applicant and the main reasons for his choice, taking into account the environmental effects.	Chapter 3: Site Selection and Alternative
5	A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.	Non-Technical Summary

Consultation

6.20. The process of consultation is an essential element of the EIA process. Views of key statutory and non-statutory consultees help inform the environmental studies and to identify specific issues that may require further investigation. Consultation is also an ongoing process which enables important feedback and consultee input in to the design evolution process, as well as enabling discussion of mitigation measures to be incorporated into the design of the Seagreen Project, thereby limiting adverse impacts and enhancing benefits.

6.21. In order to further aid transparency and to allow early identification and potential mitigation of any issues; interaction with the statutory consultees in the form of regular progress meetings was conducted throughout the EIA process. A Consultation Report, which details key feedback from consultees, has been produced to support the Seagreen Project applications (Seagreen, 2012a).

Consultation with Interested Organisations

6.22. Under the EIA Regulations, consultation must be undertaken with particular regulators and other bodies; the organisations referred to in the EIA Regulations, but defined by Marine Scotland, are known as statutory consultees. This is mandatory only for Scottish Ministers during the consideration of an application for consent, but it is best-practice for the applicant to consult statutory and other consultees throughout the EIA process. Marine Scotland have confirmed the statutory consultees to be:

- Angus Council;
- Association of Salmon Fishery Boards (ASFB);
- British Telecom (Radio Network Protection Team);
- Chamber of Shipping (CoS);
- The Crown Estate;
- Defence Infrastructure Organisation;
- Forth Ports;

- Health and Safety Executive (HSE);
- Historic Scotland;
- Joint Nature Conservation Council (JNCC);
- Joint Radio Company;
- Maritime and Coastguard Agency (MCA);
- Marine Safety Forum;
- National Air Traffic Services Limited (NATS);
- Northern Lighthouse Board (NLB);
- Royal Yachting Association (RYA);
- Scottish Canoe Association;
- Scottish Environment Protection Agency (SEPA);
- Scottish Fisherman's Organisation;
- Scottish Natural Heritage (SNH); and
- South East Scotland Inshore Fisheries Group.

- 6.23. An extended list of consultees that was agreed with Marine Scotland in September 2012 is provided in Appendix C1 of ES Volume III.
- 6.24. As previously mentioned, a request for a Scoping Opinion from the Scottish Government (Marine Scotland) and consultees was submitted in July 2010 (Seagreen, 2010). This took the form of a Scoping Report (a copy is provided in Appendix B1 of ES Volume III) and a Scoping Letter asking for opinions on the proposed scope of work and methodologies and seeking information that may be available on the Seagreen Project area. The Scoping Report set out perceived likely impacts (including in-combination and cumulative impacts) that could be anticipated as a result of the Seagreen Project, and the assessment process by which these impacts will be evaluated.
- 6.25. During the scoping stage, Seagreen requested that consultees advise if other organisations should be included in the consultation process for the Seagreen Project. No additional consultees were proposed from those initially consulted.
- 6.26. Responses from consultees were received during 2010; the final Scottish Government (Marine Scotland) scoping response, received on 28 November 2010, is provided in Appendix B2 and the remaining scoping responses not captured within the Scottish Government response are provided in Appendix B3 of ES Volume III.
- 6.27. Following submission of the Scoping Report, Marine Scotland and the environmental regulators (SNH, SEPA and JNCC) were contacted to agree the level of assessment for specific technical disciplines within the EIA, the approach to survey and data gathering survey timings and the preferred method of analysis and data presentation.
- 6.28. The Scoping Report was also used to form the basis for early consultation at the scoping stage, with a number of other (non-statutory) consultees and organisations, including those relating to the sea-users communities (fishing, navigation, recreation, etc.). Consultees were asked for relevant information, opinions on the Seagreen Project and views on the proposed assessment methodologies.

- 6.29. Each technical chapter of this ES presents a list of the organisations consulted during the scoping stage with regard to the topic to be considered and assessed. The issues raised by these consultees are addressed as far as possible in each of the technical chapters 7 to 20 of this ES and within the technical appendices in ES Volume III, where relevant. Further detail on consultation with non-statutory consultees is provided in the Consultation Report (Seagreen, 2012a).

Engagement with the Fishing Industry

- 6.30. Seagreen were aware at an early stage in the project that engagement with the local and wider fishing industry was highly important. In order to facilitate effective dialogue, a Fisheries Liaison Officer (FLO) and Fishing Industry Representatives (FIRs) with understanding of fisheries in the regional area of the Seagreen Project were appointed. Regular consultation has been undertaken since 2009 and is ongoing. Further details on specific fishing industry consultation can be found in Chapter 14: Commercial Fisheries of this ES.

Public Consultation

- 6.31. In addition to the opinions of statutory and non-statutory consultees obtained in the formal scoping stage, the views and opinions of the general public were also obtained and taken account of throughout the EIA process.

Community Council Consultation and Public Information Days January 2011

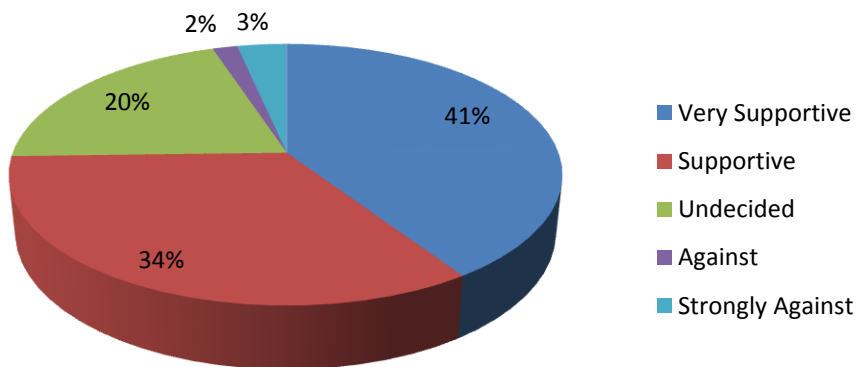
- 6.32. As part of the wider consultation process, attention was given to local concerns and interests and the Community Councils (Tealing, Carnoustie and Arbroath) were consulted. In addition, Public Information Days were held to provide information about the Seagreen Project and invite comments or ideas from the local communities. The Public Information Days were held in January 2011 at locations nearest the Seagreen Project area. Initial Public Information Days were held as follows:
- 6.33. The Public Information Days provided an opportunity for local people to comment on the Seagreen Project proposals and to discuss concerns and raise issues, which were fed back into the EIA. In order to increase awareness of the Public Information Days a poster providing details of the events were sent to local community councils and libraries for them to display, to invite local people to attend. Letters of the event were also sent to local political representatives inviting them to the Public Information Days. In addition local press advertisements were placed in the Dundee Courier, Arbroath Herald and Montrose Review. A questionnaire to enable the public to provide their views on the proposals and request additional information on the Seagreen Project, if required, was also provided at the Public Information Days. A dedicated website has also been setup to allow people to view details about the Seagreen Project and keep up to date with how it's progressing through the consenting and licensing processes.
- 6.34. The first round of exhibitions was attended by representatives from community councils and local residents; 48 questionnaires were completed. General responses to the Seagreen Project were positive with some key concerns relating to effects on the sea bed and fish and the efficiency of wind turbines. The information received has been fed back into the EIA process and the design has continued to evolve.

Public Information Days May 2012

- 6.35. A further round of Public Information Days were held in May 2012 to provide an update on the Seagreen Project, including information on the environmental baseline studies which has been undertaken during the EIA process. The second round of Public Information Days were held as follows:
- Montrose, The Park Hotel (14 May 2012);
 - Arbroath, Webster Theatre (15 May 2012);
 - Carnoustie, Leisure Centre (16 May 2012);
 - Dundee, Discovery Point (17 May 2012); and
 - Tealing, Community Hall (18 May 2012).
- 6.36. As with the January 2011 Public Information Days, notification of the days were advertised and letters sent to local political representatives. Approximately 101 individuals attended the May 2012 Public Information Days.
- 6.37. As with the January 2011 Public Information Days, attendees were asked to complete a questionnaire giving the public an opportunity to comment on the Seagreen Project and the information presented. Results showed that the majority of respondents found the information days to be ‘very helpful’ with regards to providing information about the Seagreen Project.
- 6.38. The pie chart below (Plate 6.1) shows the May 2012 responses to the questionnaire question: “*what are your views on the proposed Firth of Forth offshore wind zone?*” The majority of comments offered support for the development, but displayed slight concern for the visual impact, and the impact the construction phase would have upon local port activity.

Plate 6.1 Example of feedback questionnaire results from Public Information Days May 2012

What are your views on a proposed wind farm development in the Firth of Forth?



Forth and Tay Offshore Wind Developers Group (FTOWDG) Consultation

- 6.39. Seagreen, together with the developers (Mainstream Renewable Power Ltd and Repsol Nuevas Energías UK) of two proposed offshore wind farms in STW and The Crown Estate formed the Forth and Tay Offshore Wind Developers Group (FTOWDG).

- 6.40. The FTOWDG began collaborating in 2009 to identify potential cumulative effects on the environment of multiple OWF development, and the potential effects of OWF development in-combination with other current and reasonably foreseeable projects and activities. A desk-based study was commissioned, which identified those potentially significant cumulative effects requiring further assessment. This desk study subsequently informed further work in which the FTOWDG and specialist consultants developed assessment methodologies that would address those potential cumulative effects. The main aim of this task was to establish a common assessment benchmark, agreed with relevant stakeholders, which developers could carry forward to the assessment of cumulative effects as part of each individual project EIA.
- 6.41. In 2009 the FTOWDG agreed Cumulative Impact Assessment (CIA) topics and issued a report (Royal Haskoning, 2009) to all key stakeholders. Following this, taking in to consideration the stakeholder responses, the statutory regulator and FTOWDG agreed the CIA approach for further collaborative work.
- 6.42. Following the agreement in 2009, the FTOWDG agreed common methodologies and data sharing for many of the EIA topics. A consultation report (Royal Haskoning, 2010) was issued to key stakeholders, which described the common assessment approaches for each CIA topic. This document initiated the ongoing FTOWDG consultation with key regulators and statutory consultees.
- 6.43. FTOWDG has also undertaken consultation through the formation of topic specific sub-groups (i.e. ornithology, marine mammals, commercial fisheries and seascape, landscape and visual impact) and have also produced regional studies on key environmental and socio-economic aspects such as regional underwater noise modelling, regional navigational assessment and a regional seascape characterisation study.
- 6.44. Further information on the FTOWDG topic specific consultation and analysis of regional studies is presented in each relevant technical chapter of this ES.

Key Issues

- 6.45. Following the scoping and consultation stage, the following environmental issues were confirmed as requiring detailed assessment and these have been addressed in this ES:
- physical environment (wave and tidal regimes) and sedimentary processes (sediment transport and deposition);
 - water and sediment quality;
 - ornithology;
 - benthic ecology and intertidal ecology;
 - nature conservation designations;
 - natural fish and shellfish resource;
 - commercial fisheries;
 - marine mammals (underwater noise in particular);
 - shipping and navigation;
 - seascape, landscape and visual amenity;
 - archaeology and cultural heritage;
 - military and civil aviation; and
 - socio-economics and tourism.

- 6.46. Following a meeting with Marine Scotland on 12 March 2012, it was agreed that landside construction impacts would not be taken through to detailed assessment at the ES stage as was originally outlined in the Seagreen Phase 1 Scoping Report (Seagreen, 2010). Therefore, this ES only assesses the marine elements of the Seagreen Project up to MHWS. Assessment of landside impacts potentially arising from the Seagreen Project (including shore crossings and transition pits) above MLWS will be fully assessed within the Phase 1 Onshore ES which will be submitted to Angus Council as part of a separate planning application for consent for the onshore elements of development.

The Rochdale Envelope Principle

- 6.47. The Applicants have applied the Rochdale Envelope principle for the purpose of preserving essential flexibility within some elements of the Seagreen Project design for this EIA. This principle applies a worst case approach to the assessment of the different impacts associated with the Seagreen Project. Seagreen wrote to Marine Scotland on 16 September 2011 outlining the approach to consenting and Marine Scotland confirmed on 30 May 2012 that the approach was acceptable. A meeting was also held on 17 November 2011 when the Rochdale Envelope principle was also agreed with Marine Scotland.
- 6.48. The Rochdale cases¹ have established a process within which the impacts of projects, where the final design is not available at the consent application stage, can be addressed by setting a series of minimum and maximum parameters for which the significant effects are established. The detailed design of the project can then vary within this envelope without rendering the ES findings inadequate. This approach has been confirmed by the courts as enabling the legal requirements of the relevant EIA regulations to be complied with, so long as appropriate conditions are placed in the resulting consents to ensure that the worst case likely impacts will not be exceeded by the final built development, and will not give rise to a likely significant effect on the environment which has not been assessed within the ES.
- 6.49. There is limited guidance on the application and regulator approach to the Rochdale Envelope principle in Scotland, particularly for offshore developments. The Scottish Government has, however, endorsed the use of the Rochdale Envelope in onshore planning. On 22 November 2007 the Scottish Government issued a guidance letter (Scottish Executive, 2007) on the EIA Directive to the Heads of Scottish planning authorities confirming that they considered the Rochdale cases to be of relevance.
- 6.50. The Scottish Government (via the Short Life Task Force on Streamlining Energy Development Licensing and Consents) (Scottish Government, 2012) have recommended supporting Marine Scotland's plan to develop licensing policy guidance to improve the efficiency of the licensing process. This includes guidance on the Rochdale Envelope. Marine Scotland and SNH have commenced work on this guidance but it is not expected to be available until late 2012, therefore in its absence, guidance from the Infrastructure Planning Commission (IPC) has been referred to (IPC, 2011).
- 6.51. The application of the Rochdale Envelope approach is recognised by the DECC policies overarching NPS for Energy (EN-1) (DECC, 2011a) and NPS for Renewable Energy Infrastructure (EN-3) (DECC, 2011b). These NPSs are a relevant consideration in planning decisions in Scotland.



¹ The Rochdale principle was established through relevant planning case law – R. v Rochdale MBC ex parte Milne (No. 1) and R. v Rochdale MBC ex parte Tew [1999] and R. v Rochdale MBC ex parte Milne (No. 2) [2000]. The approach in the Rochdale cases was confirmed in R V SSSLR ex parte Diane Barker [2001] by the Court of Appeal.

- 6.52. NPS EN-3 (which is for use by the Infrastructure Planning Commission (IPC) in the consideration of nationally significant infrastructure projects in England) states: “*The IPC should accept that wind farm operators are unlikely to know precisely which turbines will be procured for the site until some time after any consent has been granted. Where some details have not been included in the application to the IPC, the applicant should explain which elements of the scheme have yet to be finalised, and the reasons. Therefore, some flexibility may be required in the consent. Where this is sought and the precise details are not known, then the applicant should assess the maximum potential adverse effects the project could have to ensure that the project as it may be constructed has been properly assessed (the ‘Rochdale Envelope’). In this way the maximum-adverse case scenario will be assessed and the IPC should allow for this uncertainty in its consideration of the application and consent.*”
- 6.53. The need for flexibility within the design of the Seagreen Project is fundamental if the project is to proceed. This type of consent flexibility has been critical to the successful deployment of large scale OWFs in the UK, which currently has the largest offshore generating capacity, and development pipeline, of any country in the world.
- 6.54. The key drivers for the flexibility of design elements includes:
- the ability to optimise projects in both design and economic terms to ensure that schemes are sufficiently attractive to investors to secure the significant capital that is required to bring projects through to delivery;
 - to allow for detailed design to be refined in the project procurement phase, notably taking into account the evolution of foundation and WTG technologies available and variety of installation techniques; and
 - an essential need to maintain competitive market behaviour in the supply chain without prejudicing legal procurement rules.
- 6.55. The need for optimisation contains two important dependent requirements:
- i. the ability to avoid fundamental supply chain constraints that could prevent delivery of the project; and
 - ii. the ability to maximise energy capture, not just focussing on total MW capacity, and to positively influence project economics.
- 6.56. Some final design details will not be available to the EIA team at the time of consent application submission. For example, it is not certain what specific type or size of WTG will be most appropriate until closer to the construction phase, following detailed engineering studies and appointment of a principle contractor. Given this uncertainty it is accepted by regulators and consenting bodies that a Rochdale Envelope can be created containing realistic minimum/ maximum extents of design parameters that are to be included in the final application for consent.
- 6.57. For each technical chapter in the ES, the EIA has assessed the likely significant effects arising from the worst case scenario within the Rochdale Envelope. Each technical chapter also clearly sets out the worst case parameters which have been assessed.
- 6.58. It should be noted that the final detailed design of the Seagreen Project will fall within these parameters but that most parameters will be dependent on others. For example, the number of WTGs built will determine the length of array cabling, the number of offshore transmission cables and the number of OSPs required. Detailed information and a description of the Seagreen Project Rochdale Envelope, for which consent is being sought, is described in Chapter 5 Project Description of this ES.

6.59. Given that the Seagreen Project will ultimately be constructed, operated and decommissioned within the minimum / maximum extent of these parameters the ES will have assessed the likely significant effects of the worst case design elements of the Seagreen Project.

Impact Identification and Evaluation

6.60. The identification and evaluation of impacts has been carried out via a number of methods and techniques. This has included literature review, collation of new and existing data, data analysis, consultation, reference to relevant guidance and standards as well as first hand experience of similar developments. This EIA is designed to evaluate potential changes to the existing environment, both positive and negative, as a result of activities associated with construction, operation and decommissioning of the Seagreen Project.

6.61. The impact methodology follows standard terminology with documentation to support the assessment. However, flexibility is retained for individual receptors. Details of the assessment methodology and data sources used are provided in the relevant section of ES technical chapters.

6.62. The assessment approach has adopted the conceptual ‘source-pathway-receptor’ model. The model identifies potential impacts resulting from the proposed activities on the environment and sensitive receptors within it. This process provides an easy to follow assessment route between impact sources and potentially sensitive receptors ensuring a transparent impact assessment. The parameters of this model are defined as follows:

- Source – the origin of a potential impact (i.e. an activity such as cable installation and a resultant effect e.g. re-suspension of sediments). This element of the model also corresponds to the ‘magnitude’ factor of the potential impact described later.
- Pathway – the means by which the effect of the activity could impact a receptor (e.g. for the example above, re-suspended sediment could settle and smother seabed). This element of the model also corresponds to the ‘sensitivity’ described later.
- Receptor – the element of the receiving environment that is impacted (this could either be a component of the physical, ecological or human environment such as water quality or benthic habitat, e.g. for the above example, species living on or in the seabed). This element of the model also corresponds to the ‘value’ described later.

6.63. Within the EIA Regulations, and various EIA best practice and guidance documentation there is interchangeable use and understanding of the words ‘effect’ and ‘impact’. It is important to distinguish between the terms ‘effects’ and ‘impacts’, as they are often used interchangeably to mean similar things:

- Effects are the physical changes in the environment that result from a particular project aspect (e.g. cable installation), these are usually measureable (e.g. in time, space, volume, weight or length) and include a range of physical changes to the environment (e.g. increased turbidity, noise, changes in wave conditions, removal of habitats); and
- Impacts are the potential changes in existing conditions of sensitive receptors in the physical, ecological or human environment as a result of an effect.

6.64. Whilst the EIA Regulations use the term ‘effects’ throughout to describe changes to existing conditions, this ES uses the term ‘impacts’.

6.65. Impacts can be classified as follows:

- direct impacts: these arise from aspects associated with the construction, operation or decommissioning of the Seagreen Project (e.g. the loss of species within the footprint of the WTG foundation, cable installation etc);
- indirect impacts: these are a result of direct impacts and may be experienced by a receptor that is removed (in space or time) from the direct impact (e.g. increased wave energy along a particular stretch of coast due to wave diffraction as a result of the presence of WTG substructures); and
- cumulative impacts (see Section ‘Assessment of Cumulative Impacts’, of this chapter), which can include:
 - ‘within project’ impacts that are likely to result from the different aspects of the Seagreen Project; and
 - potential impacts likely to occur as a result of the Seagreen Project in conjunction with other current or planned OWFs or other marine and coastal developments or activities.

Significance Criteria

6.66. The significance of residual impacts has been evaluated with reference to definitive standards, accepted criteria, technical guidance or legislation where these are available, for each technical study. Where it has not been possible to quantify impacts, and where a qualitative or semi-qualitative assessment has been made, the assessment aims to set out in a logical way in the science/ evidence based argumentation that supports the assessment. Where uncertainty exists, this has been noted in the relevant assessment section of the technical chapter.

6.67. The significance criteria generally lead to a common outcome of classifying the significance of impacts as major, moderate, minor, or negligible. Impacts are also described according to whether they are considered to be adverse or beneficial. Methodologies and criteria definitions necessarily differ between the different technical chapters but where possible the same language is used, such that the significance of the residual impacts can be compared. Where specific guidance is applicable to individual technical assessments this is referred to in the technical chapters of this ES, and any deviation from the general approach set out in this chapter is made clear.

6.68. Specific significance criteria for impacts have been developed, giving due regard to the following:

- magnitude of the impact (a function of spatial extent, duration, reversibility and likelihood);
 - spatial extent of the impact (small scale/ large scale);
 - impact duration (whether short, medium or long-term);
 - reversibility of the impact (including species or habitat recoverability); and
 - likelihood of occurrence of the impact (with an explanation of how likelihood has been assessed).
- impact nature (whether direct or indirect, reversible or irreversible);
- whether the impacts occur in isolation, are cumulative or are linked (i.e. potential inter-relationships between multiple impacts, from different aspects, to a single receptor);

- sensitivity and level of tolerance/ recoverability of the receptor or species;
- conservation or protected status of the receptor or species;
- confidence in the impact prediction; and
- the margins by which set values are exceeded.

6.69. For impacts where definitive quality standards do not exist, significance has been based on the:

- local, regional or national scale of the impact;
- impact nature in relation to established quality standards, laws or guidelines;
- number of receptors affected;
- sensitivity of these receptors;
- duration of the impact; and
- professional judgement of the assessor.

6.70. Of these criteria, the sensitivity of the receptor and the magnitude of the impact are the most important measures. The definition of sensitivity and magnitude varies depending upon the parameter under question, and therefore these will be defined in detail within each relevant section of the technical chapters.

Receptor Value and Sensitivity

6.71. Within the impact assessment the receptor’s sensitivity is identified, from negligible to high.

6.72. The sensitivity of the receptor is a function of its capacity to accommodate the proposed form of change and would reflect its capacity to recover if it is affected. In order to help define the degree of receptor value and sensitivity, the following guidance presented in Table 6.4 have been adopted for the purposes of the EIA.

6.73. The classification provided within Table 6.4 (or the technical parameter specific value/ sensitivity criteria described in the relevant section of the technical chapters) can not cater for all possible permutations of value and sensitivity for features or receptors, and professional judgment will be applied to the specific subject concerned.

Table 6.4 Definition of terms relating to the sensitivity and value of generic receptors

Value / Sensitivity	Value	Sensitivity
High	Nationally important / rare with limited potential for offsetting / compensation.	Feature / receptor has very limited capacity to accommodate the proposed form of change.
Medium	Regionally important / rare with limited potential for offsetting / compensation.	Feature / receptor has limited capacity to accommodate the proposed form of change.
Low	Locally important / rare	Feature / receptor has some tolerance to accommodate the proposed change.
Negligible	Not considered to be particularly important / rare	Feature / receptor is generally tolerant and can accommodate the proposed change.

Impact Magnitude

6.74. The impact assessment also defines the magnitude of the effect, from no change to substantial. Magnitude refers to the ‘size’ or ‘amount’ of an impact. It is a function of other aspects such as impact:

- extent (i.e. the area over which the impact occurs);
- duration (i.e. the time for which the impact is expected to last prior to recovery or replacement of the resource or feature);
- likelihood (i.e. the chance that the impact will occur); and
- reversibility (i.e. an irreversible (permanent) impact is one from which recovery is not possible within a reasonable timescale or for which there is no reasonable chance of action being taken to reverse it).

6.75. In order to help define the level of impact magnitude, the following guidance (Table 6.5) has been used for the EIA.

Table 6.5 Definition of terms relating to the magnitude of an impact

Magnitude	Definition
High	Fundamental, permanent / irreversible changes, over the whole feature / asset, and / or fundamental alteration to key characteristics or features of the particular environmental asset’s character or distinctiveness.
Medium	Considerable, permanent / irreversible changes, over the majority of the feature / asset, and / or discernible alteration to key characteristics or features of the particular environmental aspect’s character or distinctiveness.
Low	Discernible, temporary (throughout project duration) change, over a minority of the feature / asset, and / or limited but discernible alteration to key characteristics or features of the particular environmental aspect’s character or distinctiveness.
Negligible	Discernible, temporary (for part of the project duration) change, or barely discernible change for any length of time, over a small area of the feature or asset, and/ or slight alteration to key characteristics or features of the particular environmental aspect’s character or distinctiveness.

Impact Significance

6.76. Following the identification of receptor value and sensitivity and magnitude of the effect, it is possible to calculate the significance of the impact following the Impact Assessment Matrix (IAM) as presented in Table 6.6.

6.77. In order to provide a consistent approach to the treatment of different technical impacts, the following terminology has been used in the ES to define residual impacts:

- adverse – detrimental or negative impacts to an environmental resource or receptor;
- negligible – either adverse or beneficial impacts to an environmental resource that are assessed as being environmentally acceptable; and
- beneficial – advantageous or positive impact to an environmental resource or receptor.

Table 6.6 Significance of an impact resulting from each combination of receptor sensitivity and the magnitude of the effect upon it

Value / Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

6.78. The significance of the impact(s) identified can then be defined according to the terminology in Table 6.7. This methodology provides a consistent framework for considering and evaluating impacts.

Table 6.7 Terminology for classifying environmental impact

Impact Significance	Definition
Major	Very large or large change in site / asset conditions, both adverse or beneficial, which are likely to be important considerations at a regional or district level because they contribute to achieving national, regional or local objectives, or, could result in exceedence of statutory objectives and / or breaches of legislation.
Moderate	Intermediate change in site / asset conditions, which are likely to be important considerations at a local level.
Minor	Small change in site / asset conditions, which may be raised as local issues but are unlikely to be important in the decision making process.
Negligible	A barely discernible change which may not be detectable in site / asset condition and is likely to have a negligible influence on the site/ asset.
No Impact	No discernible change in site/ asset conditions, likely to have no measurable influence, irrespective of other effects.

6.79. For parameters where the method of assessment necessitates a change in terminology, then the terminology has been described in the relevant section of the technical chapter.

6.80. Major and moderate impacts are considered to be significant for the purposes of the EIA Regulations. Some of the technical chapters (Chapters 14: Commercial Fisheries, Chapter 15: Shipping and Navigating and Chapter 18: Military and Civil Aviation) have assessed impacts as either **‘not significant’** or **‘significant’**, rather than using the above scale, in accordance with the guidance provided for those specific technical assessments, as described in those technical chapters.

6.81. Each of the technical chapters provides the criteria, including sources and justifications, for quantifying the different levels of residual impact. Where possible, this has been based upon quantitative and accepted criteria (for example, noise assessment guidelines), together with the use of value judgement and expert interpretation to establish to what extent an impact is significant.

6.82. In the context of the Seagreen Project, short term impacts are considered to be those associated with the site preparation, construction and demolition stages; long term impacts are those associated with the completed, operational development; and permanent impacts extend into the post-operational stage.

Mitigation and Residual Impacts

- 6.83. The EIA process has been used as a means of informing the decision making process throughout design and evolution of the Seagreen Project to avoid potentially significant impacts where practicable, and has attempted to reduce or offset any predicted adverse environmental impacts.
- 6.84. However, where potentially significant adverse effects have not been eliminated by design at this time, this ES has identified additional mitigation measures to avoid, reduce or remedy/ compensate these effects during the construction, operation or decommissioning stages. It should be noted that as the design of the Seagreen Project continues to evolve further measures to mitigate potentially significant adverse impacts will be employed but cannot be incorporated into the impact assessment judgements as presented. It is also noted, that as part of best practice, further mitigation may be considered by the Applicants for certain impacts considered of lesser significance.
- 6.85. Each impact assessment section within each technical chapter then assigns a final significance level or residual impact to the impact described. This takes into account the implementation of any stated mitigation measures. The residual impacts are also collated within Chapter 22: Residual Impact of this ES.

Monitoring

- 6.86. Monitoring is necessary where the verification of predicted impacts (and the success of implemented mitigation measures) is required, particularly where levels of uncertainty are identified within this ES. Monitoring programmes are most commonly required as a condition of granting consent, during and for a period after construction, but can also be utilised prior to and during operations, dependent on the nature of the impact or mitigation measure under inspection.
- 6.87. The Applicants anticipate that requirements for pre-construction, during and post-construction monitoring of the Seagreen Project will form part of the requirements attached to any future licences required for construction and operation of the Seagreen Project and will work with the regulatory authorities in developing an appropriate monitoring campaign.

ES Linkages

- 6.88. The ES considers the project life cycle from construction, through operation to decommissioning, to ensure a robust and holistic impact assessment for each principal receptor (as defined in the Council Directive 2011/ 92/ EU).
- 6.89. Informed by the technical chapters, the assessment draws together the different impacts experienced by any given receptor, over all development phases, and presents them in a tabulated format for clarity of interpretation. This allows the reader to quickly and easily understand the multiple potential impacts, from a variety of sources and/ or aspects, on a selection of receptors.

Assessment of Cumulative Impacts

- 6.90. In accordance with the EIA Regulations, the ES has given consideration to 'cumulative impacts'. By definition these are impacts that result from incremental changes caused by past, present or reasonably foreseeable projects or activities together with those of the Seagreen Project. Cumulative impacts are considered for all stages of the Seagreen Project. This assessment has been split into two parts:

- i. the cumulative assessment of the combined impact of the whole Seagreen Project (i.e. comprising Project Alpha, Project Bravo and the Transmission Asset Project (to MHWS)). The assessment is detailed and numeric in most cases providing a high degree of confidence in the assessment made; and
- ii. the cumulative assessment of the Seagreen Project impact together with other OWFs and 'relevant developments' (aggregate extraction, dredging and disposal of dredged material, shipping, commercial fishing, oil and gas exploration and production as well as coastal and onshore development projects), plus any topic specific schemes which will be detailed in the relevant technical chapter. Due to data gaps, the assessment, in most cases, is qualitative and based on best available information and informed judgement. Where greater detail is available (i.e. submitted application and EIA materials) this has been considered with care taken not to over extend interpretation or over extrapolate data.

6.91. Relevant developments to be included in cumulative assessment are shown on Figure 6.1 and have been identified through consultation with relevant planning authorities on the basis of major developments that are:

- built and operational projects;
- projects under construction;
- ongoing activities (e.g. discharge consents, fisheries) – these may or may not require formal consent;
- permitted application(s), but not yet implemented;
- submitted application(s) not yet determined;
- projects identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited; and
- projects identified in other plans and programmes (as appropriate) which set the framework for future development consents / approvals, where such development is reasonably likely to come forward.

6.92. A list of relevant developments, as shown on Figure 6.1, to be included in the Seagreen Project cumulative analysis was issued to Marine Scotland on 13 July 2012. Marine Scotland responded that the list was adequate and frozen to enable EIA to be concluded on 27 July 2012. The list submitted to Marine Scotland is presented in Table 6.8 as follows.

Table 6.8 List of cumulative developments considered within the Seagreen Project EIA.

Development	Location	Brief Description	Weblink application documents	Status	EIA Development
European Offshore Wind Development Centre	Aberdeen	The project consists of up to 11 WTGs with a maximum power generation of up to 100MW. The WTGs would export the electricity onshore to a new substation and then to the National Grid. Additional onshore facilities may include a deployment centre with a research and development centre.	http://www.vattenfall.co.uk/en/aberdeen-bay.htm http://livelinkapp/livelink/IIisapi.dll?func=II&objId=18573308&objAction=browse&sort=name	Decision pending	Yes S36 Application
Near na Gaoithe Offshore Wind Farm	Firth of Forth	OWF is located some 15 kilometres (km) off the Fife coast and covers an area of approximately 100 square kilometres (km ²). The project has the potential to generate up to 450MW of renewable energy from up to 125 WTGs.	http://www.nearnagaioithe.com/about.asp http://livelinkapp/livelink/IIisapi.dll?func=II&objId=18573308&objAction=browse&sort=name	ES submission July 2012. Draft ES (excluding Ornithology Chapter) made available to Seagreen June 2012	Yes S36 Application
Inch Cape Offshore Wind Farm	Firth of Forth	Site lies in the outer Firth of Tay region. The site is located approximately 15 - 22 km to the east of the Angus coastline in Scotland. The site is expected to consist of up to 213 WTGs covering an area of about 150 km ² with an estimated installed capacity of 1,300MW.	http://www.incheapewind.com/	EIA ongoing. Repsol issued updated Rochdale Envelope to Seagreen on 29 June 2012	Yes S36 Application
Hywind Demonstration Site (Hywind II)	Near Aberdeen	Unknown	http://www.scotsrenewables.com/blog/offshorewind/float-ing-offshore-wind-park-study-announced/	No scoping yet available	Yes
Methil Wind Turbine Demonstration Project.	Methil, Fife	One 6MW offshore wind turbine. Planning app no. 10/02713/NEA	http://planning.fife.gov.uk/online/applicationDetails.do?activeTab=documents&keyVal=L6MQS4HF09N00	Consented	Yes S36 Application

Development	Location	Brief Description	Weblink to application documents	Status	EIA Development
Forth Replacement Crossing	Firth of Forth	New road bridge over Firth of Forth	http://www.transportscotland.gov.uk/strategy-and-research/publications-and-consultations/j11223-000.htm	Consented	Yes
Rosyth International Container Terminal Project	Rosyth	The works proposed comprise the formation of a berthing pocket (including quay walls, sea walls and revetment works), provision of dolphin structures and associated walkways, repair and maintenance of an existing jetty, dredging of a turning circle and approach channel in the Forth, provision of lighting columns, an electrical substation, a truck holding area, weighbridge, craneage, container stack areas, buildings, and subsidiary works.	http://www.biggarthbaillie.co.uk/ric http://www.dpea.scotland.gov.uk/CaseDetails.aspx?id=qJ13769	Decision being considered by the Scottish Government Directorate for Planning and Environmental Appeals.	Yes
Grangemouth Renewable Energy Plant	Grangemouth	Proposed 120MW biomass energy plant	http://www.forthenergy.co.uk/biomass-grangemouth.asp http://scotland.gov.uk/Topic/Business-Industry/Energy/Infrastructure/Energy-Consents/Applications-Database/Biomass/Grangemouth-Index	Decision pending	Yes
Rosyth Renewable Energy Plant	Rosyth	Proposed 120MW biomass energy plant	http://www.forthenergy.co.uk/biomass-rosyth.asp http://scotland.gov.uk/Topic/Business-Industry/Energy/Infrastructure/Energy-Consents/Applications-Database/Biomass/Rosyth-Index	Decision pending	Yes

Development	Location	Brief Description	Weblink / LiveLink to application documents	Status	EIA Development
Dundee Renewable Energy Plant	Dundee	Proposed 120MW biomass energy plant	http://www.forthenergy.co.uk/biomass-dundee.asp http://scotland.gov.uk/Topics/Business-Industry/Energy/Infrastructure/Energy-Consents/Applications-Database/Biomass/Dundee-	Decision pending	Yes
Coastal Improvement Works at the Mouth of the Barry Burn.	Land At The Mouth Of Barry Burn, Carnoustie Golf Course, Carnoustie	Coastal improvement works at the mouth of the Barry Burn comprising replacement of existing tank blocks and sand dunes with rock armour and provision of retaining wall. Planning app no. 11/ 01177/ FULL	http://planning.angus.gov.uk/PublicAccess/tc/dc/applications/application_detailview.aspx?keyval=LW5DQWCF6N000	Approved	No
GlaxoSmithKline Tidal Energy	Montrose	Proposed siting of 15 tidal turbines under the South Esk bridge (potential output 0.5MW)	http://www.thecrownestate.co.uk/energy/wave-and-tidal/our-portfolio/ http://www.swanturbines.co.uk/images/Swan%20GSK%20Press%20release%20141211.pdf http://www.montrosereview.co.uk/community/mixed_response_to_gsk_turbine_proposal_1_1866340	Known	Yes
V&A Museum	Discovery Quay Riverside Drive Dundee	Extension to the riverside walk and construction of the V&A museum building. Planning app. No. 11/ 00309/ PAN	http://bwarrant.dundee.gov.uk/publicaccess/tc/DcAapplication/application_detailview.aspx?caseno=LMXAHBG C08200	Proposal of Application Notice	Unknown

Development	Location	Brief Description	WebLink / LiveLink to application documents	Status	EIA Development
Beatrice Offshore Wind Farm	Moray Firth	It is approximately 13.5km from the Caithness coastline and will cover an approximate area of 131.5km ² . Installed capacity of up to 1,000MW	http://www.beatricewind.co.uk/environmental_statement.pdf	Decision pending	Yes S36 Application
Moray Firth Offshore Wind Farm R3 Zone	Moray Firth	The development zone is located on the Smith Bank in the Moray Firth and covers an area of 522.15 km ² . It is located 22.2 km from the coast and may have an installed capacity in the order of 1,300MW which would require approximately 260 WTGs.	http://morayoffshorerenewables.com/	ES submission to Marine Scotland September 2012.	Yes S36 Application
Phase 1 Seagreen Meteorological Mast	1.2km west of Project Alpha	Meteorological mast to provide wind speed monitoring for performance evaluation and planning of works at the site. Please note this meteorological mast is in addition to those proposed in this ES.	Marine licence Application	Decision pending	No
Seagreen Phases 2 and 3	Firth of Forth Zone	It is anticipated that there will be five OWFs in the two areas. Phase 2 is planned to comprise three wind farms, Seagreen Charlie, Seagreen Delta and Seagreen Echo with Phase 3 having two wind farms, Seagreen Foxtrot and Seagreen Golf. The total installed capacity is anticipated to be up to 2.6 Gigawatt (GW) as agreed with Marine Scotland via Seagreen letter: A4MRSEAG-Z-MGT110-SLE-142 Seagreen CIA approach letter 21 May 2012, due to the uncertainties surrounding Seagreen Phases 2 & 3 (what these projects will ultimately look like and when they are likely to enter the planning process) these phases will not be included in the cumulative assessments in this ES	http://www.seagreenwindenergy.com/offshore-scoping-phases2and3.asp	Scoping	Yes

Development	Location	Brief Description	WebLink / LiveLink to application documents	Status	EIA Development
Seagreen Onshore Phase 1 Transmission Project	Angus	Transmission assets consisting on landfall and transition pit for high voltage offshore cables. Underground terrestrial high voltage cables (maximum of 12) transmit the electricity from the Seagreen Project (Phase 1 OWFs) to the converter station and/ or substation (set up depends on transmission system) where it is connected to the National Grid network for onward transmission. The preferred landfall is Carnoustie and the location of the converter station and/ or substation will be at Tealing. It is approximately 20.5km from landfall (MLWS) to substation location.	http://www.seagreenwindenergy.com/onshore-scoping.asp	Scoping. ES submission to Angus Council Q3/ Q4 2012.	Yes
Edinburgh Harbour Masterplan	Leith, Edinburgh	Expansion of the Port at Leith including the potential widening of an existing lock system to allow larger vessels to enter.	http://www.bbc.co.uk/news/uk-scotland-scotland-business-15680630	Unknown	Yes
Port of Dundee Expansion	Dundee	Proposed expansion of the Port of Dundee.	http://scotland.unitedkingdom-tenders.co.uk/18753_Port_of_Dundee_Expansion_environmental_impact_assessment_habitat_regulations_appraisal_2012_Glasgow	Unknown	Yes
Caledonia Clean Energy Project - Coal-fuelled power station	Grangemouth	Plans include the development of a coal fuelled power station with carbon capture and storage (CCS) technology. Proposed plant would be built on the Firth of Forth at the Port of Grangemouth. Carbon dioxide emissions would be pumped to St Fergus, Aberdeenshire then pumped for storage under the North Sea.	http://www.bbc.co.uk/news/uk-scotland-tayside-central-17445479 http://www.summitpower.com/	Unknown	Yes

Development	Location	Brief Description	Weblink / LiveLink to application documents	Status	EIA Development
Cockenzie Power Station Redevelopment	Cockenzie and Prestonpans, East Lothian	Permission given for the repowering of Cockenzie Power Station from coal technology to Combined Cycle Gas Turbine (CCGT) technology.	http://www.eastlothian.gov.uk/info/161/building_control/1075/external_consultations/4	Consented	Yes Section 36

- 6.93. Each topic chapter contains a section which identifies the projects from table 6.8 that are relevant on a cumulative basis and an assessment of the relevant cumulative impact. Where no cumulative impacts have been identified, this is also stated.
- 6.94. It is important to note that for the purposes of the EIA, the level of assessment made for future projects has been determined by the level of information available on such projects at the time of the writing this ES. In decision making terms, there is of course, an important distinction between projects which are operational, under construction or fully consented and those which at the point of determination do not have consent. This question is outside the scope of this ES.
- 6.95. With respect to Phase 2 and Phase 3 of Zone development; Seagreen have taken the decision to extend the period of pre-application studies. As a result the potential locations for the Phase 2 projects: Charlie, Delta and Echo, and for Phase 3 projects: Foxtrot and Golf; are therefore unknown at present. However the intention remains to deliver a combined output target of 2.6GW in time.
- 6.96. The uncertainty surrounding the development areas and timescales for the development of Phases 2 and 3 means that any assessment of cumulative impacts arising from Phases 2 and 3 needs to be restricted to a high level qualitative approach.
- 6.97. Seagreen is both committed to delivering the target power output from the Firth of Forth Zone without causing a significant impact upon the receiving environment. Seagreen is also committed to progressing the development of Phases 2 and 3 in such a way as to ensure environmental effects and in particular cumulative environmental impacts can be minimised and significant impacts avoided.
- 6.98. The approach to Phases 2 and 3 undertaken for this ES was agreed with Marine Scotland in May 2012 (see Table 6.8).

Assumptions and Limitations

- 6.99. A number of assumptions have been made during preparation of the ES, which are set out as follows (assumptions specific to certain environmental parameters are discussed in the relevant technical chapters of the ES):
- the principal uses of the marine environment up to MHWS and adjacent to the Seagreen Project area, will remain as they are at the time of the ES submission, except in cases where consents or licences have already been granted for a development or activity. In these cases, it is assumed that the approved development will take place, and these have been treated as contributing to cumulative impacts;
 - information provided by third parties, including publicly available information and databases is correct at the time of publication;
 - there is inherent flexibility with regards to the ultimate detailed project design, including choice of technology and siting of infrastructure, as delimited by the Rochdale Envelope description; and
 - the worst case scenario for each technical chapter will be assessed, in accordance with current best practice and the Rochdale Envelope principle.

- 6.100. The EIA has been subject to the following limitations:
- i. baseline conditions have been assumed to be accurate at the time of the physical surveys but, due to the dynamic nature of the environment, conditions may change during the site preparation, construction, operational and decommissioning stages;
 - ii. baseline conditions on the use of area by other activities are assumed to be accurate and unlikely to change significantly;
 - iii. more detailed works will be required to finalise construction methods. For site preparation and construction impacts, the ES has adopted reasonable assumptions on the worst case scenario and placed reliance on the expertise of the EIA Project Team, see Table 1.4 in Chapter 1: Introduction of this ES; and
 - iv. the assessment of cumulative impacts has been reliant on the availability of information on the development schemes identified. Marine Scotland were issued with a letter dated 13 July 2012 confirming a list of all known cumulative development schemes and specifying that no new schemes could be incorporated past this date.

HABITATS REGULATIONS APPRAISAL

- 6.101. The EC Directive on the conservation of natural habitats and of wild fauna and flora 92/ 43/ EEC, generally known as ‘The Habitats Directive’ requires that certain important habitats and species are given legal protection through a network of protected sites, the Natura 2000 Network of European Sites. The Natura 2000 network includes Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) classified under the Birds Directive (Directive 2009/ 147/ EC of the European Parliament and of the Council).
- 6.102. In addition to SACs and SPAs it is the UK Government’s policy, and that of the devolved administration in Scotland, to provide Ramsar sites (designated under the Ramsar Convention on Wetlands of International Importance (Ramsar, 1971)) with the same level of protection as that provided for Natura 2000 sites. Together, SPAs, SACs and Ramsar sites make up the UK’s contribution to the EU’s Natura 2000 network of protected areas.
- 6.103. Under the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended by the Conservation of Habitats and Species Regulations 2010 and the Offshore Marine Conservation (Natural Habitats, & c.) Regulations 2007 (as amended), the competent authority (in this case the Scottish Government) must consider whether a plan or project has the potential to have an adverse effect on the integrity of a Natura 2000 site (including candidate and proposed sites). This process is known as Habitats Regulations Appraisal (HRA).
- 6.104. HRA is a four stage process:
- Stage 1: Screening is the process which initially identifies the likely effects upon a European site of a project or plan, either alone or in combination with other projects or plans, and considers whether these effects may be significant. It is important to note that the burden of evidence is to show, on the basis of objective information, that there will be no significant effect. If the effect may be significant, or is not known, that would trigger the need for an Appropriate Assessment (AA);

- Stage 2: AA is the detailed consideration of the potential effects to establish whether there is any impact on the integrity of the European site of the project or plan, either alone or in combination with other projects or plans, with respect to the European site's conservation objectives and its structure and function. This process is intended to determine whether there is objective evidence that adverse effects on the integrity of the site can be excluded. This stage also includes the development of mitigation measures to avoid or reduce any possible effects;
 - Stage 3: Assessment of alternative solutions is the process which examines alternative ways of achieving the objectives of the project or plan that would avoid adverse effects on the integrity of the European site, should avoidance or mitigation measures be unable to sufficiently reduce adverse effects; and
 - Stage 4: Assessment where no alternative solutions exist and where adverse effects remain. At Stage 4 an assessment is made with regard to whether or not the development is necessary for imperative reasons of overriding public interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the Natura 2000 network.
- 6.105. Under Regulation 61 of the Conservation of Habitats and Species Regulations 2010, AA (stage two of the HRA) is required for a plan or project, which either alone or in combination with other plans or projects, is likely to have a significant effect on a European site and is not directly connected with or necessary for the management of the site.
- 6.106. The Applicant submitted an HRA Screening Report for Offshore Phase 1 OWFs to the Scottish Government (Marine Scotland) on 11 October 2011 (Seagreen, 2011). A copy of the HRA Screening Report with its appendices can be seen in Appendix D1 of ES Volume III. The Screening Opinion was received on 23 February 2012. The main issues raised in the Screening Opinion (a copy is provided in Appendix D2 of ES Volume III) related to the ongoing consideration of post breeding and overwintering sea birds for SPAs and recommendation to undertake Population Viability Analysis (PVA) modelling for both key bird species and key marine mammals species.
- 6.107. Marine Scotland, in consultation with SNH and JNCC confirmed that the list of SACs contained within the HRA Screening Report, 'seemed justifiable' although some other sites are 'screened in' in the response.
- 6.108. The process of screening for SPAs was only completed for breeding SPA seabird interests and excludes seabird species during post-breeding, passage and overwintering periods and for non- seabird passage species (such as waders and freshwater ducks). At a FTOWDG Ornithology Meeting attended by Marine Scotland, SNH and JNCC on 2 May 2012, it was acknowledged that guidance has not yet been provided as to how to assess birds outside of the breeding season but that it is clear that the most important period of assessment is the breeding season. At the same meeting it was agreed that in the absence of guidance a precautionary position is to assume that SPA birds are protected throughout the year.
- 6.109. Guidance was provided on the HRA impact assessment process with reference to previous advice on screening. Marine Scotland advised that the relevant populations and geographic scale which should be used for the assessments will vary according to season and that the assessments will need to take account of species ecology and any inter-relationship between SPAs.
- 6.110. The key concern with respect to marine mammals was displacement from foraging and/ or transiting habitats for prolonged periods of time as a result of noise, barrier effects and chronic noise exposure. Impacts should be considered in the context of a population level

assessment framework (using the approach developed for the Moray Firth) which takes into account biological significance of potential displacement. The population level assessments should then be interpreted with regard to individual SACs. It was noted in the response that uncertainty of behavioural response and magnitude of biological consequences will influence final HRA advice.

- 6.111. Marine Scotland confirmed the assessment of impacts, with respect to fish, should focus on noise (including potential to affect migration and cause fright or mortality), Electric and Magnetic Fields (EMF), and barrier effects.
- 6.112. The impacts upon European sites are assessed within relevant technical chapters of this ES. Impacts are collated and presented with specific reference to both EIA and HRA within Chapter 9: Nature Conservation Designations of this ES.
- 6.113. A stand-alone HRA Report will be submitted to Marine Scotland by the Applicants to assist Marine Scotland in their role as the competent authority in undertaking the AA post-submission of this ES. Details of Seagreen's approach to HRA reporting is presented in Appendix D3 in Volume III of this ES.

REQUIREMENT FOR DECOMMISSIONING

- 6.114. Sections 105 - 114 of the Energy Act 2004 introduce a decommissioning scheme for offshore wind and marine energy installations. Therefore, plans for the decommissioning of Project Alpha and Project Bravo (including the transmission assets) need to be considered. A high level decommissioning programme based on the current technological and regulatory framework is provided in Chapter 5: Project Description of this ES.
- 6.115. There are a number of key issues that should be addressed as part of any decommissioning plan, to ensure the reinstatement of the Project Alpha and Project Bravo sites and ensure the availability of adequate funds to undertake decommissioning. The Energy Act 2008 updated the decommissioning provisions, strengthening the statutory decommissioning requirements to minimise the risk of liabilities falling to the UK Government. Due to the decommissioning responsibilities not being devolved to Scotland, all licensing requirements lie with DECC.
- 6.116. Throughout this ES the environmental issues relating to the decommissioning activities have been assessed within the relevant technical chapters. Following award of consent, and prior to the commencement of construction, a decommissioning plan, including funding proposals, will be agreed with DECC and The Crown Estate. The decommissioning plan will be prepared in accordance with the DECC guidance note 'Decommissioning of offshore renewable energy installations under the Energy Act 2004' (DECC, 2011c).

REFERENCES

- DECC (2011a). *Overarching National Policy Statement for Energy (EN-1)*. The Stationery Office (TSO), London.
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