

CHAPTER 1: INTRODUCTION

INTRODUCTION

- 1.1. Seagreen Wind Energy Limited (hereafter referred to as ‘Seagreen’) is seeking consent to construct and operate two offshore wind farms (OWFs) Seagreen Alpha and Seagreen Bravo which collectively comprise ‘the Seagreen Project’ in the North Sea, in the outer Firth of Forth and Firth of Tay region (Figure 1.1 Volume II).
- 1.2. The Project comprises the OWFs, (the wind turbines, their foundations and associated array cabling), together with associated infrastructure of the Offshore Transmission Asset (Offshore Substation Platforms [OSPs], their foundations and the Offshore Export Cable), to facilitate the export of renewable energy to the national electricity transmission grid (hereafter referred to as the ‘Grid’).
- 1.3. In 2014, Scottish Ministers awarded consent, for the construction and operation of these components. However, Seagreen is now applying for additional consents for an optimised design based on fewer, larger, higher capacity wind turbines that have become available since the 2014 consent decision.
- 1.4. This EIA Report provides an assessment of the potential environmental impacts of the optimised Seagreen Project, to support the application for development consent. This chapter of the EIA Report provides a brief introduction to the Seagreen Project, the project background and existing consents received, the approach taken to the assessment and the structure of this document. This chapter should be read in conjunction with other relevant chapters of the EIA Report.
- 1.5. All figures referred to in this chapter can be found in EIA Report Volume II, Figures.

EXISTING CONSENTS

- 1.6. In 2010, Seagreen Wind Energy limited, (the parent company of Seagreen Alpha Wind Energy Limited [SAWEL] and Seagreen Bravo Wind Energy Limited [SBWEL]) was awarded exclusive development rights to the Firth of Forth Round 3 Offshore Wind Farm Development Zone (Zone 2) by the Crown Estate, under its third round of offshore wind licencing arrangements.
- 1.7. In 2012, Seagreen, on behalf of SAWEL and SBWEL, submitted a suite of applications for development consent, under Section 36 of the Electricity Act 1989 and associated Marine Licences, under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009, to construct and operate two OWFs, Seagreen Alpha and Seagreen Bravo, within the Firth of Forth Development Zone (the Seagreen Phase 1 Project). The associated offshore infrastructure required to facilitate the export of power to the national electricity transmission grid (the Offshore Transmission Asset), was also included within that application.
- 1.8. Following submission of the applications in October 2012, Seagreen submitted a Habitats Regulations Assessment (HRA) Report to Marine Scotland in October 2013 (Seagreen, 2013). On advice from Marine Scotland, Seagreen submitted the HRA report as further information within an ES Addendum. This included a Non-Technical Summary (NTS), HRA information to inform Appropriate Assessment and erratum notifications for aspects of the 2012 Offshore ES.

- 1.9. Consents and licences for Seagreen Alpha OWF and Seagreen Bravo OWF and the Offshore Transmission Asset were awarded by Scottish Ministers in October 2014.
- 1.10. The Onshore Transmission Asset (the onshore export cable from landfall at Carnoustie to a new substation at Tealing) was subject to a separate planning application under the Town and Country Planning (Scotland) Act 1997 and was granted in principle by Angus Council in 2013. Planning permission in principle for the Onshore Transmission Asset was extended by Angus Council in December 2016, following re-application by Seagreen.
- 1.11. The legality of the decision to award consents for Seagreen Alpha OWF and Seagreen Bravo OWF was confirmed by the UK Supreme Court in November 2017, following legal challenge by the RSPB. The consents and licences received in 2014 and confirmed in 2017 are hereafter referred to as 'the original consents' and the original development for which consent was sought (Seagreen Alpha and Seagreen Bravo), are hereafter referred to as 'the originally consented projects'.
- 1.12. Since submission of the original consents applications, advances have been made in design and technology within the offshore wind farm industry, including increases in wind turbine size and capacity, improvements to foundation design and energy optimisation. To enable such advances to be included within the project design, Seagreen is seeking new consents for an optimised project within the same red line boundary as the originally consented projects.
- 1.13. In addition, in March 2018 Seagreen submitted an application to Marine Scotland to vary the existing 2014 consents for the Project Alpha and Project Bravo OWFs to remove the consented OWF capacity limits to allow the installation of higher rated WTGs. This application was supported by an Application Report which considered the implications of the use of higher capacity WTGs on the environment. It was concluded that this would have no implications for the environmental effects of the projects, as none of the consented physical parameters of the wind farms would change. The conclusions of the 2012 Offshore ES and 2013 ES Addendum therefore remain valid and no further EIA was required. The application was approved by Scottish Ministers in August 2018 and will allow higher capacity WTGs to be constructed under the existing 2014 consent parameters.
- 1.14. The original consents and licences received in 2014, including those varied in August 2018, are not affected by the current applications for the optimised Seagreen Project and therefore remain valid. It is Seagreen's intention to construct either the originally consented Project, or the optimised Seagreen Project presented within this EIA Report. No changes are proposed to the Offshore Transmission Asset, this remains as licensed in 2014 and therefore those components have not been re-assessed.

PURPOSE OF THE EIA REPORT

- 1.15. The purpose of this EIA Report is to support an application for two Section 36 Consents under the Electricity Act 1989 and two Marine Licences under the Marine and Coastal Access Act 2009 and Marine (Scotland) Act 2010, for an optimised project within the same red line boundary as the originally consented projects. Therefore, this EIA Report assesses those components of the proposed optimised Seagreen Alpha and Seagreen Bravo OWFs that have not previously been considered.

- 1.16. On 16 May 2017, a new set of EIA Regulations came into force, transposing amendments to the EIA Directive into UK law. In Scotland the requirements of the 2014 amendment (2014/52/EU) to the Environmental Impact Assessment (EIA) Directive (2011/92/EU) were transposed by:
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended); and
 - For projects from 12 to 200 nautical miles (nm); The Marine Works (Environmental Impact Assessment) Regulations 2007 were amended by The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2017.
- 1.17. The Electricity Works Regulations 2017 and the Marine Works Regulations 2017 (herein referred to together as the '2017 EIA Regulations') were subsequently amended by:
- The Environmental Impact Assessment (Miscellaneous Amendments) (Scotland) Regulations 2017 which came into force on the 30 June 2017 and introduced minor changes.
- 1.18. Seagreen requested a scoping opinion prior to the 16 May 2017 and the 2017 EIA Regulations coming into force. Therefore this EIA Report has been prepared in accordance with the transitional provisions set out within these Regulations. This means that the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 and the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended), continue to apply with respect to the scope of the assessment. Further information on the relevant legislation and guidance is set out in Chapter 4 (Policy and Legislation).
- 1.19. The potential environmental impacts of the optimised Seagreen project have been assessed using a systematic approach to EIA, with reference to the transitional arrangements set out within the 2017 EIA Regulations. This report describes the potential impacts of the optimised project parameters throughout construction, operation and decommissioning for both Project Alpha and Project Bravo alone and in combination with other wind farm and infrastructure projects. Impacts of the originally consented projects are set out and described in full within the 2012 Offshore ES.
- 1.20. Full details of the assessment methodology is provided in Chapter 6 (EIA Process) and a summary of the impacts assessed, both for the originally consented Projects and within this EIA Report, is provided in Chapter 17 (Summary of impacts).

THE APPLICANTS

- 1.21. Seagreen Wind Energy Ltd is a joint venture (JV) between SSE Renewables Developments (UK) Limited (SSER) and Fluor Limited (Fluor). Seagreen combines the extensive renewables development, asset management and operations experience of one of the UK's leading energy companies, with the offshore project delivery expertise of one of the world's largest publicly owned engineering, procurement, construction and maintenance (EPCM) services companies.
- 1.22. The Seagreen partner companies have a successful history of identifying, developing and constructing some of the UK's leading offshore wind sites, including Greater Gabbard OWF, the Beatrice Demonstrator project, the Beatrice and Galloper OWF projects and Arklow Bank OWF in the Irish Sea. Over the years the Seagreen partners have developed robust methodologies in the appraisal of offshore wind development opportunities, which have been utilised in its approach to Round 3 and its development of the Firth of Forth Zone.

THE SEAGREEN PROJECT

- 1.23. The Seagreen Project will be the first to be taken forward for development by Seagreen in the Firth of Forth Zone. At its closest point the Project lies approximately 27km offshore, east of the Angus coastline in the North Sea, in the outer Firth of Forth and Firth of Tay region.
- 1.24. Figure 1.1 shows the Seagreen Project including the Project Alpha and Project Bravo boundaries and the Transmission Asset boundaries, including the onshore cable route and substation location at Tealing, north of Dundee.
- 1.25. The Seagreen Project comprises:
- Seagreen Alpha OWF (hereafter referred to as 'Project Alpha') and Seagreen Bravo OWF (hereafter referred to as 'Project Bravo'), wind turbine generators, turbine foundations and associated array cabling; and
 - The 'Transmission Asset Project' which includes the offshore substation platforms (OSPs), OSP foundations and export cables to transport the power generated by the OWFs to the Grid.
- 1.26. As set out above, the offshore Transmission Asset was separately licensed. No further changes are proposed to these assets and consequently, there is no further assessment of those assets within this EIA Report.
- 1.27. The Project area considered within the optimised application is the same as that considered within the originally consented project. The location and boundary of the Zone, Project Alpha and Project Bravo are shown in Figure 1.1. In total the Seagreen Project covers an area of approximately 391km².
- 1.28. Seagreen are seeking new consents for an optimised design within the same red line boundaries as the originally consented projects, to allow advances in design and technology to be incorporated in the Project design. In summary the changes proposed include:
- The introduction of larger capacity wind turbine generators (WTGs), with associated design changes (increased rotor diameter, hub height, blade tip height and blade tip clearance);
 - A reduction in the number of larger capacity WTGs, if installed, from a maximum of 75 in each site (150 in total), to a maximum of 70 in each site and 120 in total for both sites; and
 - The introduction of a monopile foundation option.
- 1.29. The overall capacity of the project is not defined at this stage and depends on the number and capacity of the WTGs installed, within the parameters of the project design envelope defined for this assessment. It is expected that a potential combined capacity for Project Alpha and Project Bravo of approximately 1500MW may be delivered.
- 1.30. Seagreen currently holds a grid connection agreement with National Grid Electricity Transmission (NGET) for the Seagreen Project. Detailed site investigation works will improve understanding of the extent of the area for development and the most suitable locations for WTGs. This will enable development capacity and site boundaries to be refined and confirmed prior to construction.

Project Design Evolution

- 1.31. The Seagreen Project is comprised of two separate OWFs, Project Alpha and Project Bravo and the Transmission Asset Project. The OWF projects may be built out independently, or in combination and therefore any impact assessment must consider and assess the projects both in isolation and combined.
- 1.32. The original consents awarded in 2014, enable the construction, operation and decommissioning of:
- Up to 75 Wind Turbine Generators (WTGs) in both Project Alpha and Project Bravo (150 in total);
 - Up to six Meteorological masts (three in each OWF project);
 - Up to six wave buoys (three in each OWF project);
 - Up to five Offshore Substation Platforms (OSPs); and
 - Up to six export cables.
- 1.33. The project design life is anticipated to be 25 years and the overall construction duration is anticipated to be a maximum of 36 months.
- 1.34. The proposed optimised design parameters are summarised in Table 1.1. Design parameters are provided for Project Alpha, Project Bravo and where relevant, for the wind farms combined. Those design parameters which have been optimised since the original consents are highlighted for ease of reference.
- 1.35. Full details of the Project Design Envelope and the changes that have been made to optimise the project since the 2014 consents, are provided in Chapter 5 (Project Description).

Table 1.1 Summary of Optimised Design Parameters for Project Alpha and Project Bravo

Design Parameter	Optimised Design Envelope		
	Project Alpha	Project Bravo	Combined
Area (km ²)	197	194	391
Distance from shore (closest point) (km)	27	38	-
WTG			
Maximum number of Wind Turbine Generators (WTGs)	70	70	120
Maximum rotor diameter (m)	220	220	-
Maximum blade tip height (LAT) (m)	280	280	-
Minimum blade tip clearance (LAT) (m)	32.5	32.5	-
Minimum separation distance between turbines (m)	1000	1000	-
Maximum number of foundations (comprising one or more of the following options up to an individual maximum as specified):			
Gravity Base (maximum no.)	70	70	120
Pin pile jacket (maximum no.)	70	70	120
Suction caisson jacket (note: referred to as suction pile foundations in the 2012 Offshore ES) (maximum no.)	70	70	120
Monopile (in water depths up to 48m) (maximum no.)	70	35	70
Inter-array cables (maximum length in km)	325	325	650
No. of Wave buoys	Up to six across both projects areas		

- 1.36. As set out in Table 1.1 the Seagreen project has been optimised since the award of the original consents in 2014. The key design parameters that have been changed include:
- The maximum combined number of WTGs has reduced from 150 to 120;
 - The 2014 consented rotor diameter has increased from 167m to 220m;
 - The 2014 consented blade tip height has increased from 209.7m to 280m;
 - The 2014 consented minimum blade tip clearance has increased from 29.8m to 32.5m; and
 - The 2014 foundation options have been expanded to include the introduction of a monopile foundation option at up to 70 locations.

SCOPE OF THE ASSESSMENT

- 1.37. In May 2017 Seagreen submitted a Scoping Report to Marine Scotland Licensing Operations Team (MS-LOT) to seek an opinion on the scope of EIA required for a new consent application for the proposed optimised project design. In September 2017 Seagreen received a formal Scoping Opinion from MS-LOT which clearly set out the proposed scope of the assessment and key areas where further assessment may be required.
- 1.38. The Scoping Opinion confirms that the 2012 Offshore ES has previously assessed the potential significant environmental impacts of the full design envelope and the range of design parameters for the originally consented Project, and that where those design parameters remain unchanged, there is no need for further assessment. Where significant impacts are not anticipated to arise, or where the significance of impact has already been assessed and concluded to be not significant, these topics/receptors are, therefore, scoped out of further assessment. However, where project design optimisation results in changes to design envelope parameters, the potential environmental impact of those changes require assessment. In addition, where the baseline environment is considered to have changed, or where best practice in assessment approach has developed and improved then these aspects are scoped into the assessment, in line with the 2017 Scoping Opinion.
- 1.39. Socio-economics was originally scoped out of assessment in this EIA Report, however an up to date assessment of the potential economic benefits of the optimised Seagreen Project is included in Chapter 15.
- 1.40. On this basis, this EIA Report therefore focuses on the following topic areas:
- Ornithology;
 - Natural Fish and Shellfish Resource;
 - Marine Mammals;
 - Commercial Fisheries;
 - Shipping and Navigation;
 - Seascape, Landscape and Visual Amenity;
 - Military and Civil Aviation; and
 - Socio-economics.

1.41. For ease of reference, the scope of the assessment for the full design envelope for which consent is being sought is summarised in Chapter 7 (Scope of EIA Report). For context Chapter 7 also presents the environmental measures incorporated into the design in the 2012 Offshore ES and conditions on the 2014 consents and licences relevant to the management of environmental risk. For completeness the conclusions of significance of impact, for both the originally consented project design envelope and the optimised project design envelope (where relevant) are summarised in Chapter 17 (Summary of Impacts) within this EIA Report.

STRUCTURE OF THE EIA REPORT

1.42. The Structure of this EIA Report is as follows:

- EIA Report Volume I (this document). Chapters 1 to 7 describe the Seagreen Project, design evolution, the legal and policy framework and the scope of the assessment as follows:
 - Chapter 2: Need for the Project;
 - Chapter 3: Site Selection and Alternatives;
 - Chapter 4: Policy and Legislation;
 - Chapter 5: Project Description;
 - Chapter 6: EIA Process; and
 - Chapter 7: Scope of EIA Report.
- Chapters 8 to 15 contain the technical assessments undertaken for identified environmental topics scoped into the assessment (in line with the 2017 Scoping Opinion). The Technical Chapters are:
 - Chapter 8: Ornithology;
 - Chapter 9: Natural Fish and Shellfish Resource;
 - Chapter 10: Marine Mammals;
 - Chapter 11: Commercial Fisheries;
 - Chapter 12: Shipping and Navigation;
 - Chapter 13: Seascape, Landscape and Visual Amenity;
 - Chapter 14: Military and Civil Aviation; and
 - Chapter 15: Socio-economics.
- Chapter 16 provides the Habitats Regulations Appraisal (HRA) for the application.
- Chapter 17 provides a summary of potential impacts which includes impact assessment conclusions for the optimised Seagreen project (2018) and for completeness and comparison, impact assessment conclusions from the 2012 Offshore ES, including the Offshore Transmission Asset.
- Chapter 18 provides a summary of mitigation and monitoring proposed.
- All Figures are contained within EIA Report Volume II: Figures and all appendices are contained within EIA Report Volume III: Technical Appendices. A glossary of key terms is provided at the end of this report.

PROJECT TEAM

1.43. This EIA Report presents the results of the assessment of environmental impacts undertaken by a number of specialist consultants. This EIA Report has been coordinated and prepared by NIRAS Consulting Ltd. The Project Team along with their respective disciplines and contribution to this assessment are presented in Table 1.2. Full details of the project team, qualifications and experience is provided in Appendix 1A.

Table 1.2 Seagreen Project EIA and Design Team

Expertise/EIA Input	Organisation
Introductory chapters (1 to 7)	NIRAS
Principal designers and engineers	Seagreen
Legal advisors to Seagreen and part of the ES review team	Burges Salmon
NTS and concluding chapters (16 to 18)	NIRAS
Ornithology Chapter	NIRAS
Ornithological Surveys and Technical Reporting	ECON
Population Viability Analysis	DMP Statistical Solutions UK Ltd.
Natural Fish and Shellfish Resource	NIRAS
Marine Mammals Chapter	NIRAS
Marine Mammals Technical Reporting – population modelling and chapter inputs	SMRU Consulting
Commercial Fisheries	Brown and May Marine Ltd.
Shipping and Navigation	Anatec Ltd
Navigational Risk Assessment	Anatec Ltd
Seascape, Landscape and Visual Amenity Chapter	The Landscape Partnership
Military and Civil Aviation Chapter	PagerPower
Socio-economics Chapter	Biggar Economics
Provision of underwater noise modelling study and Technical Report	CEFAS

REFERENCES

MS-LOT (2017) Scoping opinion for the proposed section 36 consent and associated marine licence application for the revised Seagreen phase 1 offshore project, 15 September 2017.

Seagreen (2017) Seagreen Phase 1 Offshore Project Scoping Report Round 3: Firth of Forth.

Seagreen (2012) Seagreen Phase 1 Offshore Project Environmental Statement.

Seagreen (2013) Addendum to Seagreen Phase 1 Offshore Environmental Statement (Information to inform Appropriate Assessment)