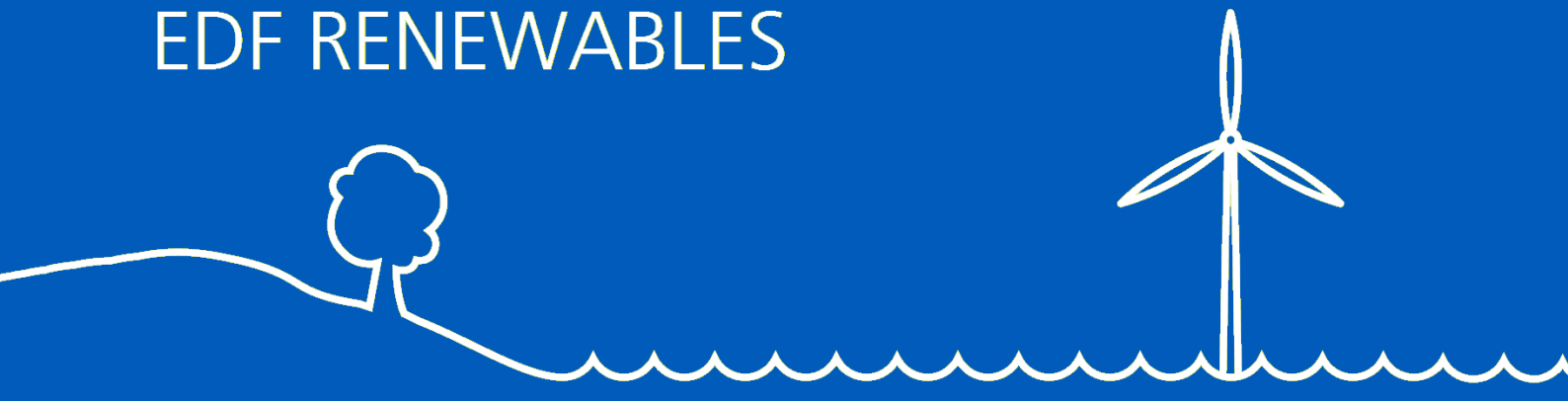
EDF RENEWABLES



Neart na Gaoithe Offshore Wind Farm

Design Statement

March 2024

Rev 2.1

DOCUMENT REFERENCE: NNG-NNG-ECF-PLN-0004

NnG OFFSHORE WIND

EDF renewables

Neart na Gaoithe Offshore Wind Farm

Design Statement

Pursuant to Section 36 Consent Condition 13 and the Marine Licence (Offshore Transmission Works) Condition 3.2.2.18

For the approval of the Scottish Ministers

Authored by:

LUC (Land Use Consultants Ltd.) undertook the Seascape, Landscape and Visual Impact Assessment (SLVIA) of the Neart na Gaoithe offshore Wind Farm as part of S36 consent applications. Paul Macrae (MA Hons CMLI) was the Project Manager for the SLVIA work and is also the author of this Design Statement. Paul has over 15 years' experience as a Chartered Landscape Architect, focusing on the landscape and visual assessment of wind farm development in Scotland.

DOCUMENT APPROVAL		
Name (Role)	Signature	Date
David Sweenie Consents Manager	[redacted]	19/03/2024
Michelle Elliott Offshore Consents		19/03/2024
Robert MacKintosh Environmental Clerk of Works		19/03/2024
Paul Macrae Landscape Architect		19/03/2024

Executive Summary

The Design Statement (DS) provides information relevant to conditions attached to the Section 36 Consent and Marine Licences issued to Neart na Gaoithe Offshore Wind Limited (NnGOWL). The DS presents a comparison of the visual effects of the Project assessed in the Application and supporting Environmental Impact Assessment (EIA) Report (NnGOWL, 2018) and the visual effects of the final Project layout and specification, as detailed in the Development Specification and Layout Plan (DSLP). A comparative Zone of Theoretical Visibility and visualisations are provided to illustrate the analysis included in this report.

This review has been undertaken by Chartered Landscape Architects and finds that visual effects of the DSLP Layout during both day and night time remain effectively the same as those assessed for the Application Layout in the EIA (2018). The turbine size, rotor diameter and hub height proportion, and numbers of the DSLP Layout have remained the same as the Application Layout assessed in the EIA (2018). The Design Statement is submitted to the Marine Directorate Licensing Operations Team (MD-LOT) on behalf of the Scottish Ministers for approval, and Angus Council, Dundee City Council, East Lothian Council, Fife Council, Scottish Borders Council, Scottish Natural Heritage, Maritime and Coastguard Agency, and other bodies as required by MD-LOT, for information only.

Contents

Figures

Tables

Acronyms and Abbreviations

TERM	DESCRIPTION
ECoW	Environmental Clerk of Works
EIA	Environmental Impact Assessment
ES	Environmental Statement
LAT	Lowest Astronomical Tide
MS-LOT	Marine Scotland Licensing Operations Team
NnGOWL	Neart na Gaoithe Offshore Wind Limited
OSP	Offshore Substation Platform
S36	Section 36
SLVIA	Seascape, Landscape and Visual Impact Assessment
SNH	Scottish Natural Heritage
VP	Viewpoint
WTG	Wind Turbine Generator
ZTV	Zone of Theoretical Visibility

Defined Terms

TERM	DESCRIPTION
Addendum	The Addendum of Additional Information submitted to the Scottish Ministers by NnGOWL on 26 July 2018.
Application	The Environmental Impact Assessment Report, Habitats Regulations Appraisal Report submitted to the Scottish Ministers by NnGOWL on 16 March 2018; the Addendum of Additional Information submitted to the Scottish Ministers by NnGOWL on 26 July 2018 and the Section 36 Consent Variation Report dated 08 January 2019.
Company	Neart na Gaoithe Offshore Wind Limited (NnGOWL) (Company Number SC356223). NnGOWL has been established to develop, finance, construct, operate, maintain and decommission the Project.
Consent Conditions	The terms that are imposed on the Company under the Offshore Consents that must be complied with
Consent Plans	The plans, programmes or strategies required to be approved by the Scottish Ministers (in consultation with appropriate stakeholders) in order to discharge the Consent Conditions.

TERM	DESCRIPTION
Contractors	Any Contractor/Supplier (individual or firm) working on the Project.
EIA Report	The Environmental Impact Assessment Report, dated March 2018, submitted to the Scottish Ministers by NnGOWL as part of the Application.
Inter-array Cables	The offshore cables connecting the wind turbines to one another and to the OSPs.
Interconnector Cables	The offshore cables connecting the OSPs to one another.
Marine Licences	The written consents granted by the Scottish Ministers under the Marine (Scotland) Act 2010, for construction works and deposits of substances or objects in the Scottish Marine Area in relation to the Wind Farm (Licence Number 06677/19/0) and the OfTW (Licence Number 06678/19/1), dated 4 June 2019 and 5 June 2019 respectively.
Offshore Consents	The Section 36 Consent and the Marine Licences.
Offshore Export Cable Corridor	The area within which the offshore export cables are to be located.
Offshore Export Cables	The offshore export cables connecting the OSPs to the landfall site.
OfTW	The Offshore Transmission Works comprising the OSPs, offshore interconnector cables and offshore export cables required to connect the Wind Farm to the Onshore Transmission Works at the landfall.
OfTW Area	The area outlined in red and blue in Figure 1 attached to Part 4 of the OfTW Marine Licence.
OnTW	The onshore transmission works from landfall and above Mean High Water Springs, consisting of onshore export cables and the onshore substation.
Project	The Wind Farm and the OfTW.
Section 36 Consent	The written consent granted on 3 December 2018 by the Scottish Ministers under Section 36 of The Electricity Act 1989 to construct and operate the Wind Farm, as varied by the Scottish Ministers under section 36C of the Electricity Act 1989 on 4 June 2019.
Section 36 Consent Variation Report	The Section 36 Consent Variation Report submitted to the Scottish Ministers by NnGOWL as part of the Application as defined above on 08 January 2019.
Subcontractors	Any Contractor/Supplier (individual or firm) providing services to the Project.
Wind Farm	The offshore array as assessed in the Application including wind turbines, their foundations and inter-array cabling.
Wind Farm Area	The area outlined in black in Figure 1 attached to the Section 36 Consent Annex 1, and the area outlined in red in Figure 1 attached to Part 4 of the Wind Farm Marine Licence.

Consent Plans

CONSENT PLAN	ABBREVIATION	DOCUMENT REFERENCE NUMBER
Decommissioning Programme	DP	NNG-NNG-ECF-PLN-0016
Construction Programme and Construction Method Statement	CoP and CMS	NNG-NNG-ECF-PLN-0002
Piling Strategy	PS	NNG-NNG-ECF-PLN-0011
Development Specification and Layout Plan	DSLP	NNG-NNG-ECF-PLN-0003
Design Statement	DS	NNG-NNG-ECF-PLN-0004
Environmental Management Plan	EMP	NNG-NNG-ECF-PLN-0006
Operation and Maintenance Programme	OMP	NNG-NNG-ECF-PLN-0012
Navigational Safety and Vessel Management Plan	NSVMP	NNG-NNG-ECF-PLN-0010
Emergency Response Cooperation Plan	ERCoP	NNG-NNG-ECF-PLN-0015
Cable Plan	CaP	NNG-NNG-ECF-PLN-0007
Lighting and Marking Plan	LMP	NNG-NNG-ECF-PLN-0009
Project Environmental Monitoring Programme	PEMP	NNG-NNG-ECF-PLN-0013
Fisheries Management and Mitigation Strategy	FMMS	NNG-NNG-ECF-PLN-0008
Offshore Written Scheme of Investigation and Protocol for Archaeological Discoveries	WSI & PAD	NNG-NNG-ECF-PLN-0005
Construction Traffic Management Plan	CTMP	NNG-NNG-ECF-PLN-0014

1 Introduction

1.1 Background

1. The Neart na Gaoithe Offshore Wind Farm (Revised Design) received consent under Section 36 of the Electricity Act 1989 from the Scottish Ministers on 03 December 2018 and was granted two Marine Licences by the Scottish Ministers, for the Wind Farm and the associated Offshore Transmission Works (OfTW), on 03 December 2018. The S36 consent and Wind Farm Marine Licence were revised by issue of a variation to the S36 Consent and Marine Licence 06677/19/0 on 4 June 2019, and the OfTW Marine Licence by the issue of Marine Licence 06678/19/1 on the 5 June 2019. The revised S36 Consent and associated Marine Licences are collectively referred to as 'the Offshore Consents'.
2. The Project is being developed by Neart na Gaoithe Offshore Wind Limited (NnGOWL).

1.2 Objectives of this Document

3. The S36 Consent and Marine Licences contain a variety of conditions that must be discharged prior to the commencement of any offshore construction works. One such requirement is for the submission to the Scottish Ministers of a Design Statement (DS).
4. The relevant conditions setting out the requirement for a DS are set out in full in Table 1-1 below. This document is intended to fully satisfy the requirements of the Offshore Consents conditions by providing consideration of the visual effects of the Project, as set out in the Development Specification and Layout Plan (DSLP).

Table 1-1: Consent conditions to be discharged by this DS

OFFSHORE CONSENTS REFERENCE	CONDITION TEXT	WHERE ADDRESSED
Section 36 Consent Condition 13	The Company must, no later than six months prior to the Commencement of the Development, submit a Design Statement ("DS"), in writing, to the Scottish Ministers.	This document forms the DS for approval by the Scottish Ministers.
	The DS, which must be signed off by at least one qualified landscape architect, as instructed by the Company prior to submission to the Scottish Ministers, must include representative wind farm visualisations from key viewpoints as agreed with the Scottish Ministers, based upon the final DSLP as approved by the Scottish Ministers as updated or amended.	Page 2 includes authorship details. Appendix A includes visualisations from key viewpoints. These are based on the final DSLP. Viewpoints were agreed with the Scottish Ministers as set out in Table 3-1 Consultation Summary.
	The Company must provide the DS, for information only, to Angus Council, Dundee City Council, East Lothian Council, Fife Council, Scottish Borders Council, SNH, MCA and any such other advisors or organisations as may be required at the discretion of the Scottish Ministers.	This document will be provided to the named bodies, and any others advised by the Scottish Ministers.

OFFSHORE CONSENTS REFERENCE	CONDITION TEXT	WHERE ADDRESSED
OFTW Marine Licence Condition 3.2.2.18	The Licensee must, no later than six months prior to the Commencement of the Works, submit a DS, in writing, to the Licensing Authority.	This document forms the DS for approval by the Licensing Authority.
	The DS, which must be signed off by at least one qualified landscape architect, as instructed by the Licensee prior to submission to the Licensing Authority, must include representative wind farm visualisations, including OSPs, from key viewpoints as agreed with the Licensing Authority, based upon the final DSLP as approved by the Licensing Authority as updated or amended.	Page 2 includes authorship details. Appendix A includes visualisations from key viewpoints. These are based on the final DSLP and include the OSPs. Viewpoints were agreed with the Licensing Authority as set out in Table 3-1 Consultation Summary.
	The Licensee must provide the DS, for information only, to Angus Council, Dundee City Council, East Lothian Council, Fife Council, Scottish Borders Council, SNH, MCA and any such other advisors or organisations as may be required at the discretion of the Licensing Authority.	This document will be provided to the named bodies, and any others advised by the Licensing Authority.

1.3 Linkages with other Consent Plans

5. This DS compares the visual effects of the Project as detailed in the DSLP with the visual effects of the Project as set out in the 2018 Application. The Offshore Consents conditions require that the DS is based upon the DSLP, and the DS also takes account of the Lighting and Marking Plan (LMP) as summarised in Table 1-2 below.

Table 1-2: DS consistency and links to other Consent Plans

CONSENT REFERENCE	CONSENT PLAN	CONSISTENCY WITH AND LINKAGE TO DSLP
Section 36 Consent, Condition 13 OfTW Marine Licence, Condition 3.2.2.18	Development Specification and Layout Plan (DSLP)	Provides details of the layout and specification of the Project, used to inform the visualisations in this DS.
Section 36 Consent, Condition 20 OfTW Marine Licence, Condition 3.2.2.19	Lighting and Marking Plan (LMP)	Provides details of lighting and marking of the Project, used to inform the night time visualisation in this DS.

1.4 DS Document Structure

6. In response to the specific requirements of the conditions attached to the Offshore Consents, this DS has been structured so as to be clear that each part of the specific requirements have been met. The document structure is set out in Table 1-3 below.

Table 1-3: DS document structure

SECTION		SUMMARY OF CONTENT
1	Introduction	Identifies the requirement in the Offshore Consents for a DS, confirms the scope and structure of this DS and its relationship to other Consent Plans.
2	Project Overview	Provides details in relation to the site, turbine specification and layout, and construction of the Wind Farm.
3	Consultation	Sets out a summary of consultation undertaken to agree viewpoints and visualisations with consultees.
4	Guidance	Provides details of guidance used and referred to in this report.
5	Zone of Theoretical Visibility and Visualisation Methodology	Presents analysis of areas of potential change in visibility between the Application Layout and the DSLP Layout based on a Zone of Theoretical Visibility (ZTV) map. Provides details of selected key viewpoints. Sets out the methodology for creation of visualisations based on the turbine layout and specification identified in the DSLP, and comparative wirelines including the EIA (2018) layout.
6	Design Appraisal	Presents key design aims identified in the Application Layout and previous applications. Sets out the evolution of the minimal design changes between the DSLP Layout and the Application Layout. Compares the Application Layout to the DSLP Layout, appraising potential changes in visual effect from key viewpoints.
7	Comparison with the Application	Compares the layout and specification included within the DSLP with the Application Layout, assessed in the Seascape, Landscape and Visual Impact Assessment (SLVIA) of the EIA (2018).
Appendix A	Visualisations	Comparative wirelines, baseline photography and photomontages to support the DS.

2 Project Overview

7. The Wind Farm Area is located to the northeast of the Firth of Forth, 15.5 km directly east of Fife Ness on the east coast of Scotland. The Wind Farm Area covers approximately 105 km^2. Offshore Export Cables will be located within the 300 m wide Offshore Export Cable Corridor, running in an approximately southwest direction from the Wind Farm Area, making landfall at Thorntonloch beach to the south of Torness Power Station in East Lothian. Figure 2-1 shows the Wind Farm Area and Offshore Export Cable Corridor.

8. The Offshore Consents allow for the construction and operation of the following main components, which together comprise the Project:

    - 54 wind turbines generating a maximum generating output of around 450 Megawatts (MW);
    - 54 jacket substructures installed on pre-piled foundations, to support the wind turbines;
    - Two alternating current (AC) substation platforms, referred to as Offshore Substation Platforms (OSPs), to collect the generated electricity and transform the electricity from 66 kV to 220 kV for transmission to shore;
    - Two jacket substructures installed on piled foundations, to support the OSPs;
    - A network of inter-array subsea cables, buried and/or mechanically protected, to connect strings of turbines together and to connect the turbines to the OSPs;
    - One interconnector cable connecting the OSPs to each other;
    - Two buried and/or mechanically protected subsea export cables to transmit the electricity from the OSPs to the landfall at Thorntonloch and connecting to the onshore buried export cables for transmission to the onshore substation and connection to the National Grid network; and
    - Minor ancillary works such as the deployment of met ocean buoys and permanent navigational marks.

9. Offshore construction commenced in August 2020 and is scheduled to take approximately five years to complete. Details of the construction programme are provided in the NnGOWL Construction Programme (CoP).

10. The details of the Wind Farm that could alter the level of landscape and visual impact are primarily the location, number and dimensions of the wind turbines. The layout presented in the DSLP ('the DSLP Layout') is similar to the layout that has consent ('the Application Layout'), having the same turbine dimensions and turbine numbers. The turbine layout has been refined from the indicative layout presented in the EIA.

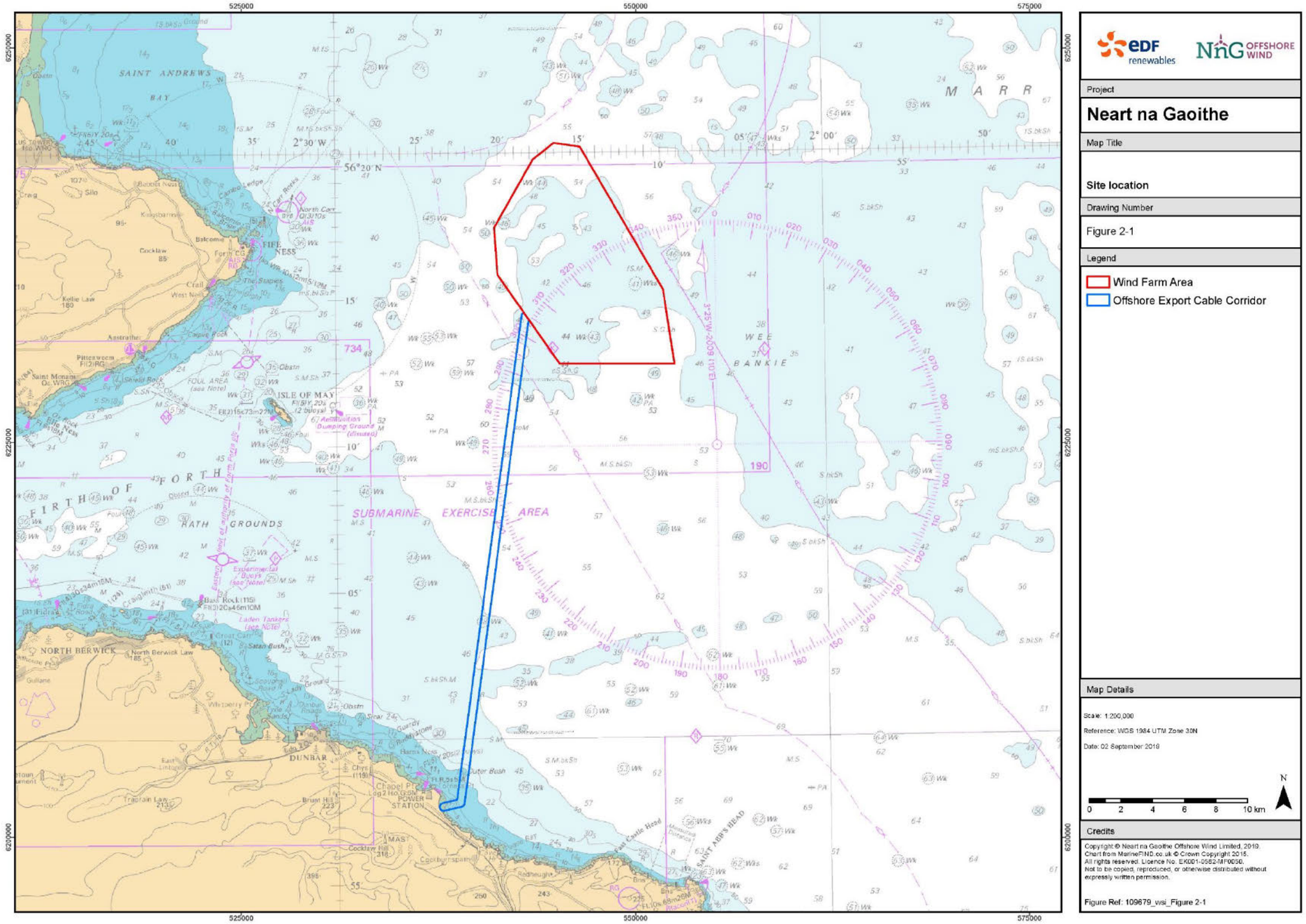


Figure 2-1 Project Overview

3 Consultation

11. Table 3-1 below provides a summary of consultation undertaken to agree viewpoints and visualisations for the DS. Marine Scotland Licensing Operations Team (MS-LOT) and Scottish Natural Heritage (SNH) were consulted to seek advice and agreement on viewpoints and visualisations, as well as the scope of the DS. A note[1] was sent to consultees detailing the proposed approach to the Design Statement. Advice received in response to the content of this note is detailed below.

Table 3-1: Consultation Summary

CONSULTEE	CONSULTATION RESPONSE	DATE	NNGOWL COMMENTS
SNH	**Response to Neart na Gaoithe Offshore Wind Farm: Design Statement Scoping (letter dated 5th September 2019)** SNH agree with structure of proposed DS Viewpoints, photography and format of visualisations acceptable Night time assessment requested. Minimum of one, preferably 2 sets of updated night time visualisations requested Night time viewpoints N2 (B961, Carmyllie) and N5 (Crail) suggested for night time visualisations Night time baseline images to be re-rendered to show better contrast between land, sea and sky Lights advised to be rendered brighter than those shown in 2018 images	17th September 2019	Night time assessment is included in Section 7: Comparison with the Application. Updated night time visualisations for viewpoints N2 (B961, Carmyllie) and N5 (Crail) are included in Appendix A. The turbine lights are set to the specified brightness (in candela) within a computer model. This is therefore a technical setting, and to brighten the lights would require either setting a higher candela level than is actually proposed, or manually editing the apparent brightness. We are not aware of any technical justification that would recommend either option, and the approach to visualising the lighting remains unchanged.
MS-LOT	**Response to Neart na Gaoithe Offshore Wind Farm: Design Statement Scoping (letter dated 5th September 2019)** MS-LOT content with the proposed scope of DS Viewpoints to be agreed with SNH following finalised DSLP	17th September 2019	Design Statement produced in accordance with agreed approach. Viewpoints agreed with SNH as noted above.

[1] Neart na Gaoithe Offshore Wind Farm: Design Statement Scoping (5th September 2019).

4 Guidance

12. The following guidance has been referred to in preparation of the Design Statement:

- Landscape Institute (2011), Photography and Photomontage in Landscape and Visual Impact Assessment - Advice Note 01/11;
- Scottish Government (2006), Planning Advice Note 68: Design statements;
- SNH (2006), Visual Representation of Wind Farms: Good Practice Guidance. Version 1;
- SNH (2016), Advice on Offshore Wind Design Statements;
- SNH (2017), Visual Representation of Wind Farms Guidance. Version 2.2;
- SNH (2017), Siting and Designing Wind Farms in the Landscape. Version 3a; and
- SNH (2012) Offshore Renewables: Guidance on assessing the impact on coastal landscape and seascape.

13. Note that some of the above guidance has been superseded but was current at the time that photography etc. was undertaken, as explained throughout this DS.

5 Zone of Theoretical Visibility and Visualisation Methodology

5.1 Zone of Theoretical Visibility (ZTV)

14. The ZTV is the area within which the Offshore Wind Farm is theoretically visible, and therefore where it may have an effect upon visual amenity and/or landscape character.

15. A comparative zone of theoretical visibility (ZTV), shown on Figure 5-1 immediately below, compares area of theoretical visibility for the Application Layout to that of the DSLP Layout. The ZTV assessment was performed on 'bare ground' digital terrain model (DTM), which does not take account of potential screening by buildings or vegetation.

16. The ZTV indicates little change in areas from which turbines are likely to be seen, as the DSLP turbines will be the same height and will occupy the same area as in the consented layout.

500000 525000 550000 575000 600000

6275000 6250000 6225000 6200000

Note
The CZTV is calculated to turbine tip heights (208m) from a viewing height of 2m above ground level. The terrain model assumes bare ground and is derived from OS Terrain 50 height data (obtained from Ordnance Survey in July 2017). The sea has been levelled out to 0m using MWH. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcMap 10.5.1 software.

N2
VP7
VP12
VP13
N5
VP14
VP16
VP17
VP18

5km
10km
15km
20km
25km
30km
35km
40km
45km
50km
55km

N O R T H

500000 525000 550000 575000 600000

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NnG OFFSHORE WIND

Project

Neart na Gaoithe

Map Title

Comparative Zone of Theoretical Visibility (CZTV)

Drawing Number

Figure 5.1

Legend

- Offshore Wind Farm Area
- Study Area (50km from Offshore Wind Farm Area)
- 5km Intervals from Offshore Wind Farm Area
- Application turbine layout
- DSLP Turbine layout
- Viewpoint location
  - VP7: Arbroath
  - VP12: St Andrews, East Scores
  - VP13: Fife Ness, Lochaber Rock
  - VP14: Anstruther Easter
  - VP16: Isle of May
  - VP17: North Berwick Law
  - VP18: Dunbar
  - N2: B961, Carmyllie
  - N5: Crail

Theoretical layout visibility

- Only the Application layout is visible
- Only the DSLP layout is visible
- Both layouts are visible

Map Details

Scale: 1:425,000
Reference: WGS 1984 UTM Zone 30N
Date: 01 November 2019

GoBe
LUC

N

0 4 8 12 16 20 km

Credits

Figure Ref: FIG5-1_10836_r1_CZTV_2017vs2019TL_A3L

5.2 Selection of Viewpoints

17. Seven key viewpoints and two night-time viewpoints, selected from those illustrated and assessed in the 2018 Application, have been identified and agreed with MS-LOT and SNH. The location of viewpoints is shown on Figure 5.1. Viewpoint location maps are included as part of the visualisations in Appendix A. Note that the 2018 EIA Report figure numbering as well as viewpoint numbering has been preserved to aid comparison.

Table 5-1: DS Viewpoints

VIEWPOINT	EASTING	NORTHING	DISTANCE TO CLOSEST TURBINE (KM)	REASON FOR SELECTION[2]
VP 7 – Arbroath	364047	740440	32.1	Listed building with an elevated platform and historic connection to the Bell Rock, now a museum
VP 12 – St Andrews, East Scores	351572	716671	28.5	Popular location within the town, by the abbey, overlooking St Andrews Bay, on the Fife Coastal Path
VP 13 – Fife Ness, Lochaber Rock	363844	709759	15.6	Easternmost point of Fife, unobstructed views across the outer Firth and Tay, on the Fife Coastal Path
VP 14 – Anstruther Easter	357897	704143	22.1	Representative of views from coastal settlement at a local play park with foreshore access, on the Fife Coastal Path
VP 16 – Isle of May	365655	699329	16.4	The island is a popular day-trip destination, and a useful proxy for marine views
VP17 – North Berwick Law	355645	684235	33.0	Popular walking destination close to North Berwick, enabling wide views over the Firth of Forth
VP18 – Dunbar	367583	679172	28.0	Park with views of Dunbar Castle, representative of views from coastal settlement, on John Muir Way
N2 – B961, Carmyllie (night-time)	354993	743026	39.6	An elevated inland location with limited light intrusion
N5 – Crail (night-time)	361013	707243	18.5	Location in the settlement, likely to be frequented at night

5.3 Baseline photography

18. Baseline photography from the Original ES, taken between 2011 and 2013, and the EIA Report (2018), taken in 2017, has been reused for the selected viewpoints. Photography was taken in accordance with relevant good practice guidance current at the time (SNH, 2006; SNH, 2017b; Landscape Institute, 2011). 90° (cylindrical projection) baseline photography for each viewpoint is included in Appendix A.

[2] As identified in the EIA (2018)

5.4 Wirelines

19. Wirelines have been generated based on the finalised turbine layout and specification detailed in the DSLP. 90° (cylindrical projection) and 53.5° (planar projection) wirelines are shown for each viewpoint in Appendix A. In addition, comparative wirelines for each VP, showing the Application Layout and the DSLP Layout side by side, are included.

5.5 Photomontages

20. Photomontages have been prepared to show the DSLP Layout, and are presented in accordance with SNH guidance (2017b), showing a 53.5° horizontal field of view (planar projection). As advised by SNH guidance (Advice on offshore design statements, 2016) the yellow colour on turbine jackets has been shown, and both OSPs are included.

6 Design Appraisal

6.1 Design Objectives

21. Key guidance and previous work which informed the design approach and design objectives for the illustrative Application Layout and wind turbine specification was included in Appendix 14.1 of the 2018 EIA Report.

22. Appendix 14.1 also included an analysis of layout alternatives and concluded with a number of key design objectives for the proposed Project. Paragraph 9.47 of Annex 1 to Appendix 14.1 sets out these design recommendations:

    - "*Seek to minimise the overall horizontal spread of the Offshore Wind Farm in views from the shore, by forming a compact layout within the Wind Farm Area;*
    - *Highly regular grids have a logical appearance but lead to dense stacking of turbines in particular views that are aligned with the layout – this can create an uneven appearance of clusters and gaps which changes significantly from different view angles;*
    - *Seek to balance the logic of a grid layout with the more organic appearance of an irregular layout;*
    - *Avoid outlying turbines that will appear detached from the rest of the Offshore Wind Farm;*
    - *The distribution of sensitive visual receptors, to the northwest, west and southwest, means it is unlikely that a grid layout could be devised so as to avoid stacking effects at all of these locations;*
    - *Introducing a degree of irregularity, as the EIA layout does, creates a more organic appearance that can help to avoid the clustering or stacking of turbines in the view;*
    - *A more irregular layout also shows less change from different angles, so that it is more likely to present a coherent appearance from multiple viewpoints; and*
    - *There is no clear pattern in the seascape that a regular grid could meaningfully respond to, which again may favour a more irregular design solution*."

23. The illustrative application layout developed for the EIA considered a less rigid layout and comprised an "*outer 'ring' of closely spaced turbines, with more widely spaced turbines in the centre*".

6.2 Design Process

24. The following constraints have been taken into account in defining the DSLP Layout and are detailed in the DSLP:

- *"A 100m buffer from the site lease boundary within which no wind turbine towers should be located (as required under the terms of the Crown Estate Agreement for Lease);*
- *An avoidance of areas of deep sediment associated with paleo channels where sediment deposits can be up to 73 m deep, and of areas of exposed bedrock (for reasons of engineering feasibility);*
- *An avoidance of water depths in excess of 56 m (for reasons of engineering and installation feasibility);*
- *The Leuchars Station Precision Approach Radar (PAR) safeguarding area extending out to 20 nm from the radar location covering an area in a 20° arc each side of the approach to the Leuchars Station runaway; and*
- *Several features of potential archaeological interest, including charted wrecks and features identified by geophysical survey, and their associated Archaeological Exclusion Zones (AEZs) as presented in the Marine Archaeology Reporting Protocol (MARP)."*

25. The layout also ensures adequate access for any search and rescue operations.

26. The Application Layout and DSLP Layout both comprise 54 turbines at 208 m tip height. The evolution of the design and specification from the draft layout submitted at the application stage to the finalised DSLP Layout is discussed below in relation to the key design objectives identified in the EIA Report.

6.2.1 Horizontal spread

27. The Application Layout and DSLP Layout both comprise 54 turbines and occupy a similar proportion of the view, as they are placed within the same area of the sea.

6.2.2 Balance the logic of a grid layout with the organic appearance of an irregular layout

28. The DSLP Layout includes a similar outer ring of regularly and more closely spaced turbines, with turbines in the centre of the cluster more organically spaced. Paragraph 17 of the DSLP indicates that engineering constraints and variable seabed conditions have resulted in a more irregular layout.

6.2.3 Avoid outlying turbines

29. The Application Layout and DSLP Layout are both located within the same wind farm area, with an outer ring of regularly spaced turbines which contain the horizontal extents of the development. Whilst the arrangement of turbines in the centre of the cluster has changed, spacing remains even across the development. Visual outliers have been avoided, as discussed in relation to viewpoints in Section 6.3.

6.2.4 Introduce a degree of irregularity to avoid the clustering or stacking of turbines in the view

30. The Application Layout and DSLP Layout both include irregularly spaced turbines located within the interior of the cluster.

6.2.5 Additional points

31. Several spare locations, to be used should ground conditions prevent micro-siting of turbines or OSP locations, are identified in the DSLP. Given these locations are situated internally within the turbine cluster, additional visual effects are considered unlikely should any be utilised.

32. Aviation and marine navigation lighting proposals are described in the LMP. There is no substantive change in the proposed lighting and marking between the Application Layout and the DSLP Layout.

33. Peripheral structures will be lit with 2,000 candela aviation warning lights, mounted on the top of each nacelle, and flashing Morse 'W'. Internal Structures will be lit with 200 candela search and rescue (SAR) lighting, mounted on the top of each nacelle, which will be switched off during normal operations.

34. Significant peripheral structures will be fitted with flashing yellow marine navigation lights, with 5 nautical mile nominal range. Lights shall be located not less than 6m and not more than 30m above Highest Astronomical Tide (HAT). For the purposes of visualisation, 30m above HAT has been assumed as worst case in terms of visibility from land.

6.3 Viewpoint Appraisal

35. An appraisal of differences in visual effect between the Application Layout and the DSLP Layout is included in the following table, with reference to the comparative wirelines in Appendix A.

Table 6-1: Viewpoint Appraisal of Differences in Visual Effects between DSLP Layout compared to Application Layout

VIEWPOINT	VISUAL EFFECT APPRAISAL
VP 7 – Arbroath (Figure 14.41.2)	There is no change in the horizontal extent of the wind farm. Whilst a degree of turbine stacking is present in views from this location, composition is slightly improved with the northern part of the wind farm more evenly spaced.
VP 12 – St Andrews, East Scores (Figure 14.26.2)	There is no change in the horizontal extent of the wind farm. Turbines appear in an organic arrangement. Whilst a slight increase in turbine stacking is present in views from this location, the difference in composition between the Final Layout and Application Layout is largely imperceptible in views experienced from this distance.
VP 13 – Fife Ness, Lochaber Rock (Figure 14.27.2)	There is no change in the horizontal extent of the wind farm. Turbines appear in an organic arrangement and spacing across the cluster has been improved by more even spacing.
VP 14 – Anstruther Easter (Figure 14.28.2)	There is no change in the horizontal extent of the wind farm. Turbines appear in an organic arrangement with a similar amount of turbine stacking as the Application Layout.
VP 16 – Isle of May (Figure 14.30.2)	There is no change in the horizontal extent of the wind farm. The Final Layout shows spaces between turbines that do not appear in the Application Layout, but this is balanced by more even spacing elsewhere in the wind farm.
VP17 – North Berwick Law (Figure 14.31.2)	There is no change in the horizontal extent of the wind farm. Turbine spacing appears even across the cluster with minimal stacking of turbines, similar to the composition of the Application Layout.
VP18 – Dunbar (Figure 14.32.2)	There is no change in the horizontal extent of the wind farm. The Final Layout shows spaces between turbines that do not appear in the Application Layout, but this is balanced by more even spacing elsewhere in the wind farm.
N2 – B961, Carmyllie (Figure 14.45.2)	There is no change in the horizontal extent of the wind farm. Lighting of turbines and jacket substructures remains consistently spaced across the cluster.

VIEWPOINT	VISUAL EFFECT APPRAISAL
N5 – Crail (Figure 14.48.2)	There is no change in the horizontal extent of the wind farm. Lighting of turbines and jacket substructures remains consistently spaced across the cluster.

7 Comparison with the Application

36. Both the Application Layout and the DSLP Layout include 54 turbines and two offshore substation platforms of similar dimensions. There is no change in the horizontal extent of the wind farm in views, with spacing of turbines appearing similar to, or more even, across the cluster than in the Application Layout.

37. Night-time effects remain similar, with lighting of turbines seen in long-distance views consistently spaced across the development.

38. The DSLP Layout is considered to be within the parameters assessed in the Seascape, Landscape and Visual Impact Assessment included in the EIA Report.

References

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Appendix A - Visualisations