

BERWICK BANK WIND FARM

DEROGATION CASE



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ACRONYMS

Acronym	Definition
AA	Appropriate Assessment
AEOI	Adverse Effect on Integrity (of a European site)
AR3	(CfD) Allocation Round 3
AR4	(CfD) Allocation Round 4
BEIS	Department for Business, Energy and Industrial Strategy
BESS	British Energy Security Strategy
CCC	Committee on Climate Change
CES	Crown Estate Scotland
CfD	Contract for Difference
COP	The UN's Conference of the Parties
Defra	Department for the Environment, Food & Rural Affairs
EC	European Commission
ECJ	European Court of Justice
EIA	Environmental Impact Assessment
EU	European Union
GB / UK	Northern Ireland operates under a different electricity market framework to the rest of Great Britain (GB). Great Britain (GB) is referenced in relation to electricity generation and transmission, and Scotland, or the UK, are referenced as the nation(s) which have legally committed to Net Zero carbon emissions.
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GVA	Gross Value Added
HND	Holistic Network Design
HRA	Habitats Regulations Appraisal (or Assessment)
INTOG	Innovation and Targeted Oil and Gas Decarbonisation (CES leasing round)
IPCC	Intergovernmental Panel on Climate Change
LAT	Lowest Astronomical Tide
LCoE	Levelised cost of energy
LSE	Likely Significant Effect
MHWS	Mean High Water Springs
MN 2000	Managing Natura 2000 Sites
MPA	Marine Protected Area
MS-LOT	Marine Scotland Licensing Operations Team

Acronym	Definition
NETS	National Electricity Transmission System
NPF	National Planning Framework (Scotland)
NPS	National Policy Statements for Energy Infrastructure
OWF	Offshore Wind Farm
PIA	Project Identification and Approval process
PDE	Project Design Envelope
REZ	The UK Renewable Energy Zone. An area of sea outside the UK territorial sea over which the UK claims exclusive rights for production of energy from water and wind under section 84 of the Energy Act 2004.
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation (a type of European site)
SMP	Sectoral Marine Plan for Offshore Wind Energy
SNCB	Statutory Nature Conservation Bodies
SofS	Secretary of State (for BEIS)
SPA	Special Protection Area, for birds (a type of European site)
STW	Scottish Territorial Waters
TCE	The Crown Estate
TEC	Transmission Entry Capacity
UXO	Unexploded Ordinance
ZAP	Zone Appraisal and Planning

EXECUTIVE SUMMARY

1. The derogation case provides the reasons and evidence to enable Scottish Ministers to consent the offshore components of the Berwick Bank Wind Farm (the Proposed Development) under the Habitats Regulations Assessment (HRA) Derogation Provisions.
2. The first section gives an overview of the Proposed Development and provides information on the relevant Scottish and UK legislation. A summary of the consultation is provided followed by a summary of the Report to Inform Appropriate Assessment (RIAA) and demonstrates how the Applicant has engaged with statutory and non-statutory consultees to develop a robust set of compensation measures. The Applicant's position on Adverse Effect on Integrity (AEOI) is explained in relation to the different layers of precaution applied within the RIAA, and the need for a derogation case is set out.
3. Two approaches have been taken in the RIAA to assess the potential for AEOI on the relevant Special Protection Areas (SPAs). The Scoping Approach has used the parameters advised in the scoping opinion. The Applicant has also presented an alternative assessment that uses parameters more in line with standard practice/ guidance – the Developer Approach
4. Using the Scoping Approach, the RIAA concludes that an AEOI cannot be excluded at eight SPAs – Buchan Ness to Collieston Coast, East Caithness Cliffs, Farne Islands, Flamborough and Filey Coast, Forth Islands, Fowlsheugh and St Abbs to Fast Castle. Four species are affected – Kittiwake, Guillemot, Puffin and Razorbill.
5. Using the Developer Approach, the RIAA concludes that an AEOI cannot be excluded at five SPAs. East Caithness Cliffs, Flamborough and Filey Coast, Forth Islands, Fowlsheugh and St Abbs to Fast Castle. Only Kittiwake is affected using this approach.
6. Section Two gives more detail on the guidance and planning precedent that has informed the development of the derogation case and demonstrates that Applicant has considered in detail all the relevant information. Section Three provides a summary of the need for the Project and the key role that the Project must play in delivering Scottish and UK targets. This section is supported by an additional Statement of Need, which is provided with the application and demonstrates that the project is an essential part of the future generation mix.
7. Without the Project, it is probable that delivery of a multitude of policies will fall short, including: the Scotland Sectoral Marine Plan, Scottish Energy Strategy, the Ten Point Plan, UK Net Zero Strategy and UK Offshore Wind Sector Deal, as well as the targets set by the Climate Change (Scotland) Act 2009, Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, the (UK) Climate Change Act 2008 (as amended) and the Net Zero Strategy: Build back Greener.
8. The next three sections deal with the legal tests that must be considered under the Habitat Derogation provisions. Firstly, alternative solutions to the Proposed Development are considered by identifying the core objectives of the project, then considering the “Do Nothing” scenario before assessing any feasible alternatives. A robust case is presented that sets out a comprehensive assessment of possible alternative locations and a range of potential alternative designs to meet the project objectives. In all cases no feasible alternative solutions were identified that could meet the project objectives.
9. Secondly, the compelling case for authorising the Proposed Development for IROPI is made. The project must be carried out for imperative reasons given the urgent need to address climate change and meet legally binding targets. The long-term public interest of decarbonisation and security of supply of affordable energy supplies are in the overriding long-term public interest and demonstrably outweigh any AEOI which is predicted in respect of the identified SPAs.

10. Finally, the process whereby the applicant has identified and assessed the feasibility of the necessary compensation measures is set out. The applicant has carried out extensive consultation and research to develop these measures and supporting information is provided in the three reports submitted with the application.
 - Colony based compensatory measures evidence report – provides detailed information on the development of the colony measures and the quantification of predicted benefits
 - Fisheries based compensatory measures evidence report - provides detailed information on the development of the colony measures and the quantification of predicted benefits
 - Implementation and monitoring plan – provides an outline of the tasks and timelines to deliver the measures.
11. The final part of this section demonstrates the sufficiency of the benefits that will be delivered by the proposed compensation measures and that the overall coherence of the national site network will be protected if they are implemented. These measures, assuming the worst case assessed in the RIAA and the most precautionary benefit from compensation measures, will provide very high compensation ratios of at least 8X the impacts. This provides considerable confidence to Scottish Ministers that the measures will be effective.

PART A: BACKGROUND INFORMATION

1. INTRODUCTION

1.1. THE PROPOSED DEVELOPMENT OVERVIEW

12. Berwick Bank Wind Farm Limited (the Applicant) is proposing to develop the Berwick Bank Wind Farm (The Project), in the outer Firth of Forth and Firth of Tay within the former Round 3 Firth of Forth Zone.
13. The Project will include offshore and onshore infrastructure including an offshore generating station (array), offshore export cables to landfall and onshore transmission cables leading to an onshore substation with electrical balancing infrastructure, and connection to the electricity transmission network. The offshore components of the Project seaward of MHWs are referred to as the Proposed Development.
14. The array comprises 307 wind turbines, with an estimated capacity of 4.1 gigawatt (GW). The array will be approximately 47.6 km offshore of the East Lothian coastline and 37.8 km from the Scottish Borders coastline at St, Abbs. It lies to the south of the offshore wind farms (OWF) known as Seagreen and Seagreen 1A, south-east of Inch Cape OWF and east of Neart Na Goaithe OWF.
15. The Proposed Development has secured Grid Connection Offers from National Grid Electricity System Operator (NGESO) for 4.1GW of Transmission Entry Capacity (TEC).
16. A grid connection will run from the southern/south-western boundary of the array and make landfall at Skateraw on the East Lothian coast. The Applicant is also developing an additional export cable and grid connection to Blyth, Northumberland (the “Cambois connection”). Applications for the necessary consents (including marine licences) for the Cambois connection will be applied for separately once further development work has been undertaken on this offshore export corridor.
17. Chapter 3 (Project Description) of the Offshore EIA Report provides a detailed description of the Proposed Development and should be referred to for further detail.
18. The construction and operation of an OWF in Scottish waters (i.e., Scottish territorial waters (STW) and the Scottish offshore region) requires consent under Section 36 of the Electricity Act 1989 and Marine Licences under the Marine (Scotland) Act 2010 (within STW) and under the Marine and Coastal Access Act 2009 (within the Scottish offshore region, between 12 – 200 nautical miles (nm)).
19. The Scottish Ministers are responsible for determining applications for Section 36 Consent and for Marine Licences. Where both are required, Marine Scotland’s Licensing Operations Team (MS-LOT) can process both applications jointly on behalf of the Scottish Ministers.
20. This Report supports applications by the Applicant for Section 36 Consent and Marine Licences for the Proposed Development. As part of the Scottish Ministers determination of these applications, a Habitats Regulations Appraisal (HRA) is required under the applicable Habitats Regulations, as summarised in the following sections.

1.2. ORIGINS OF HRA: EU HABITATS & BIRDS DIRECTIVES

21. The European Union (EU) Habitats Directive¹ and Wild Birds Directive² seek to conserve particular natural habitats and wild species across the territory of the EU by, amongst other

¹ Council Directive 92/43/EEC.

² Council Directive 2009/147/EC.

- measures, establishing a core network of sites for the protection of certain habitat types, species and wild birds (“European sites”).
22. The overall aim is to ensure the long-term survival of viable populations of Europe's most valuable and threatened species and habitats, throughout their natural range, to maintain and promote biodiversity. European sites make up an EU-wide network known as “Natura 2000”.
 23. The UK has withdrawn from the EU. However, legislation transposing the Habitats and Birds Directives remains in place (subject to technical amendments), and case law and guidance referenced in this Report largely reflect or continue to refer to the Habitats and Birds Directives. Therefore, before turning to the UK legislation, it is useful to set out their terms for context.
 24. The protection and management of European sites is governed by Article 6 of the Habitats Directive. Amongst other things, Articles 6(3) and 6(4) lay down an assessment and permitting process concerning the authorisation of any plan or project likely to have a significant effect on any European site.
 25. Articles 6(3) and 6(4) prescribe a staged process: firstly, any such plan or project must be subject to an assessment to determine whether it would adversely affect the integrity of any European site and if so that plan or project may not proceed (Article 6(3)); secondly, a derogation process such that a plan or project found to adversely affect site integrity may still proceed, despite a negative assessment, if certain requirements are met (Article 6(4)). The full legal text is set out in Table 1 below.

Table 1 Legal text of Articles 6(3) and 6(4)

Habitats Directive 92/43/EEC

Article 6(3)

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.”

Article 6(4)

“If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission to other imperative reasons of overriding public interest.”

1.3. SCOTLAND AND UK HABITATS LEGISLATION

26. Articles 6(3) and 6(4) of the Habitats Directive were transposed into UK law by, amongst others, the regulations identified in Table 2 below, each commonly referred to as the Habitats Regulations.
27. Where in this Report the need arises to refer to a specific legislative provision, for simplicity reference is made only to The Conservation of Offshore Marine Habitats and Species Regulations 2017. However, the relevant provisions in the different sets of Habitat Regulations are materially the same and there is no legal or practical need to differentiate between them in this Report and the term Habitats Regulations is used as a collective reference encompassing all three sets of Regulations.

Table 2 Habitats Regulations relevant to the Proposed Development

The Conservation (Natural Habitats, &c.) Regulations 1994	Applicable to plans or projects in Scotland or Scottish territorial waters (0 – 12nm).
The Conservation of Habitats and Species Regulations 2017	Applicable to applications for consent under section 36 of the Electricity Act 1989.
The Conservation of Offshore Marine Habitats and Species Regulations 2017	Applicable to plans or projects in the Scottish offshore region (beyond 12nm).

28. The procedure established by Articles 6(3) and 6(4) of the Habitats Directive relating to the authorisation of plans or projects, is known in Scotland as Habitats Regulations Appraisal (HRA) and is commonly regarded as a four stage process, which is summarised in Sections 1.4 and 1.5 below.
29. In Scotland and the wider UK, the HRA process is applied, either as a matter of law or policy, to Special Areas of Conservation (SAC), Sites of Community Importance, candidate SACs and Special Protection Areas (SPAs), potential SPAs and possible SACs.
30. The substantive HRA process and requirements are largely unchanged notwithstanding the UK's withdrawal from the EU, albeit the Habitats Regulations have been subject to some technical changes. In particular, the Habitats Regulations continue to use the term "European sites", but they now comprise a UK network which is called the "*national site network*" (previously they were part of Natura 2000). Therefore, references in the Habitats Regulations to the "*coherence of Natura 2000*" must now be read as references to the coherence of the UK's "*national site network*".

1.4. OVERVIEW OF HRA STAGES 1 – 2: SCREENING AND AA

31. The Habitats Regulations require that a project³
 - not directly connected with or necessary to the management of a European site, and
 - "*likely to have a significant effect*" (LSE) on a European site (whether alone or in combination with another plan or project)

³ The process applies equally to a plan as to a project, but for simplicity we focus on its application to a project since this Report is concerned with a project rather than a plan.

- must be subject to an “*appropriate assessment*” (AA) of the implications for that European site in view of the site's conservation objectives⁴.
32. The legal obligation to undertake an AA ultimately rests with the relevant “competent authority” under the Habitats Regulations. For the Section 36 Consent and Marine Licence applications, that is the Scottish Ministers⁵. However, the Applicant has an obligation to provide such information as the Scottish Ministers may reasonably require for the purposes of carrying out an AA⁶.
 33. The identification of LSE is commonly referred to as HRA stage 1 and typically an applicant will conduct a screening exercise and provide an HRA Screening Report to inform this stage. The carrying out of an AA is commonly referred to as HRA stage 2 and typically an applicant will provide the Competent Authority with the necessary evidence and assessment in a Report to Inform an Appropriate Assessment (RIAA).
 34. Subject to a derogation process (HRA stages 3 and 4) as outlined in Section 1.5 below, a project can only be authorised if at the end of HRA stage 2, the competent authority is able to conclude, beyond reasonable scientific doubt in light of the findings of the AA, that the Proposed Development will not adversely affect the integrity of any European site(s).
 35. Further information on HRA stages 1 and 2 is contained in the Applicant's RIAA and is not repeated here.

1.5. OVERVIEW OF HRA STAGES 3 & 4: DEROGATION PROVISIONS

36. The Habitats Regulations provide an exception to the general prohibition set out above, known as a “derogation”. A project can be allowed to proceed notwithstanding a conclusion that there will be an adverse effect on site integrity (AEOI) in respect of any European site(s) if the competent authority is satisfied that the following tests are met⁷:
 - There are no alternative solutions to the project (Stage 3A); and
 - There are “*imperative reasons of overriding public interest*” (IROPI) for the project to proceed (Stage 3B).
37. If the Stage 3 requirements are met, the Scottish Ministers are then subject to a legal obligation to “secure that any necessary compensatory measures are taken to ensure that the overall coherence of the [national site network] is protected”⁸ (HRA Stage 4).
38. For ease of reference, the applicable legal text (hereinafter the HRA Derogation Provisions) which provide the framework for HRA Stages 3 and 4 is set out in Table 3 below. The process for HRA Stages 3 and 4 is addressed in extensive detail in Parts B, C and D of this Report.

⁴ Regulation 28(1), (2) and (5) of The Conservation of Offshore Marine Habitats and Species Regulations 2017.

⁵ Regulation 5 of The Conservation of Offshore Marine Habitats and Species Regulations 2017.

⁶ Regulation 28(3) of The Conservation of Offshore Marine Habitats and Species Regulations 2017.

⁷ Regulation 29 of The Conservation of Offshore Marine Habitats and Species Regulations 2017.

⁸ Regulation 36 of The Conservation of Offshore Marine Habitats and Species Regulations 2017.

Table 3 Relevant Scottish / UK Derogation Provisions⁹

Reg	Legal Text
29 (1)	<i>"If it is satisfied that, there being no alternative solutions, the plan or project referred to in regulation 28(1) must be carried out for imperative reasons of overriding public interest (which, subject to paragraph (2), may be of a social or economic nature), the competent authority may agree to the plan or project notwithstanding a negative assessment of the implications for the site.</i>
29 (2)	<i>Where the site concerned hosts a priority natural habitat type or a priority species, the reasons referred to in paragraph (1) must be either - (a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or (b) any other imperative reasons of overriding public interest.</i>
31(4)	<i>Where a competent authority in Scotland agrees to a plan or project under regulation 29 notwithstanding a negative assessment of the implications for a European site in Scotland or for a European offshore marine site in the Scottish offshore region, it must notify the Secretary of State as soon as practicable following that agreement.</i>
31(5)	<i>Where the Scottish Ministers propose to agree to a plan or project under regulation 29 notwithstanding a negative assessment of the implications for a European site outside Scotland or a European offshore marine site outside the Scottish offshore region— (a) they must notify the Secretary of State; and (b) they may agree to the plan or project only after having been notified of the Secretary of State's agreement, which may be given subject to such conditions or restrictions as the Secretary of State may specify.</i>
36 (1)	<i>This regulation applies where, notwithstanding a negative assessment of the implications for a European offshore marine site or European site - (a) a plan or project is agreed to in accordance with regulation 29;...</i>
36 (2)	<i>The [Scottish Ministers] must secure that any necessary compensatory measures are taken to ensure that the overall coherence of [the national site network] is protected."</i>

1.6. HRA PROCESS TO DATE & APPLICANT'S POSITION ON AEOI

39. While ultimately it is the duty of the Scottish Ministers to apply the HRA process and to carry out an AA, the Applicant acknowledges it has an obligation to present such information as the Scottish Ministers may reasonably require for that purpose.
40. To that end, the Applicant has compiled the necessary evidence and information to support an AA decision by the Scottish Ministers and this information is contained in the RIAA. The RIAA enables an AA of each relevant European site screened in for assessment.
41. The Applicant's RIAA has for the most part adopted the advice on ornithological assessment parameters advised in the Scoping Opinion. Nevertheless, the Applicant considers elements of the Scoping Opinion to be over-precautionary and a departure from standard advice/practice. As such, in the RIAA the Applicant has presented a dual assessment of potential displacement/barrier effects and collision effect pathways during operation based on:
 - The 'Scoping Approach' and
 - The 'Developer Approach'.

⁹ See the Conservation of Offshore Marine Habitats and Species Regulations 2017. There are other provisions not set out which only apply where the relevant Competent Authority is not the Scottish Ministers.

42. The Scoping Opinion contained advice on the displacement rates and displacement mortality rates. These rates have been used for the purposes of assessment under the Scoping Approach.
43. Under the Developer Approach, these displacement rates differed in some cases, based upon available evidence for displacement, the extent of a features ranging behaviour (particularly in the non-breeding periods), previous precedent and a need to incorporate precaution within the assessment.
44. Assumptions on the collision impacts for Kittiwake also differed between the Developer and Scoping approach.
45. Table 4 sets out the annual adult bird mortalities¹⁰ from the Proposed Development alone, apportioned to each SPA where the **Scoping Approach** has found an AEOL. For the majority of features a conclusion of AEOL is due to the in-combination effect of other plans and projects. Only for two features at three SPAs was an AEOL identified from the Proposed Development alone (guillemot at Forth Islands, Fowlsheugh and St Abb's Head to Fast Castle, and kittiwake at St Abb's Head to Fast Castle).
46. If Scottish Ministers choose to adopt this assessment approach, kittiwake, razorbill, guillemot and puffin would require compensatory measures to be secured at the SPAs listed in Table 4.

Table 4 SPAs and qualifying features for which AEOL has been concluded based on the scoping approach to calculate adult mortality. The mortalities for kittiwake represent a combined impact value for collision and displacement. The mortalities for all other species are a result of displacement only

Species	SPA	Scoping Approach
Kittiwake	Forth Islands	43.3
	St Abbs Head to Fast Castle	130.5
	Fowlsheugh	371.3
	Farne Islands	35.2
	East Caithness Cliffs	41.1
	Troup, Pennan & Lion's Heads	18.4
	Buchan Ness to Collieston Coast	21
	Flamborough and Filey Coast	38.2
	TOTAL	699

¹⁰ The mortalities for kittiwake represent a combined impact value for collision and displacement. The mortalities for all other species are a result of displacement only.

Species	SPA	Scoping Approach
Guillemot	Forth Islands	180.5
	St Abbs Head to Fast Castle	576.1
	Fowlsheugh	473.3
	TOTAL	1229.9
Razorbill	Forth Islands	19
	St Abbs Head to Fast Castle	14.4
	East Caithness Cliffs	14.8
	Fowlsheugh	23
	TOTAL	71.2
Puffin	Forth Islands	30.2
	TOTAL	30.2

47. Table 5 sets out the annual adult bird mortalities from the Proposed Development alone, apportioned to each SPA where the **Developer Approach** has found an AEOI. In all but one SPA (kittiwake at St Abbs Head to Fast Castle) an AEOI was due to the in-combination effect of other plans and projects.

48. If Scottish Ministers choose to adopt this assessment approach, only kittiwake would require compensatory measures to be secured at the SPAs listed in Table 5.

Table 5 SPAs and qualifying features for which AEOI has been concluded based on the developer approach to calculate adult mortality. The mortalities for kittiwake represent a combined impact value for collision and displacement. The mortalities for all other species are a result of displacement only.

Species	SPA	Developer Approach
Kittiwake	Forth Islands	28.9
	St Abbs Head to Fast Castle	87
	Fowlsheugh	253.3
	Farne Islands	23.3
	East Caithness Cliffs	18.4
	Troup, Pennan & Lion's Heads	9
	Buchan Ness to Collieston Coast	11.4
	Flamborough and Filey Coast	17
	TOTAL	448.3

49. The Applicant is confident that the Developer Approach is the most appropriate methodology for the RIAA as the scoping approach is over-precautionary. Nevertheless, the Applicant has provided the necessary information and justification (the Derogation Case) to satisfy the HRA Derogation Provisions in respect of all features identified under the scoping approach. This demonstrates that sufficient compensation can be secured for any scenario for which the RIAA has found an AEOI.
50. It should be noted that, in addition to several Scottish SPAs, both approaches have identified an AEOI at English SPAs. In circumstances where AEOI are identified for a European site outside Scotland or the Scottish offshore region, the Scottish Ministers must notify the Secretary of State (SofS) and can only agree to the Proposed Development after having been notified of the SofS's agreement.
51. As such, this Report provides a comprehensive Derogation Case that can be relied upon by the Scottish Ministers and SofS to the extent required.

1.7. SUMMARY OF CONSULTATION TO DATE

52. The Applicant recognises the importance of engaging with relevant stakeholders with respect to its Derogation Case, in particular with statutory nature conservation bodies (SNCBs) with regards to the development of potential compensation measures.
53. The Applicant has sought the advice of the SNCBs and other key stakeholders and kept them updated on project developments. The Applicant has engaged openly and transparently including by issuing an initial questionnaire and / or undertaking interviews, followed by a series of online meetings from October 2021 to November 2022, including with NatureScot, MS-LOT, RSPB, Scottish Seabird Centre, Centre for Ecology and Hydrology, National Trust for Scotland, National Trust, Scottish Wildlife Trust, a local ornithological consultant, local bird ringer/ornithological experts, Defra, SFF, FRS, Seabird centre Board and Natural England. A full report of consultation carried out specifically with regard to derogation and compensation matters is provided in Appendix 1 of this document. A summary of the wider consultation process carried out for the Project is set out in Volume 1 Chapter 5 Stakeholder Engagement and Consultation of the EIA.

1.8. SUPPORTING INFORMATION

54. This Report refers to other documents which have been submitted as part of the Application. For brevity, this information is not reproduced in full here. A list of the key documents supporting the Applicant's Derogation Case is provided in below. Full details for material referenced within this Report are provided in the References section at the end of this Report.
- Report to Inform Appropriate Assessment
 - Statement of Need
 - Offshore Planning Statement
 - Enhancement, Mitigation and Monitoring Commitments (Volume 3, Appendix 6.3)
 - Offshore EIA: Project Description (Volume 1 Chapter 3)
 - Offshore EIA: Site Selection and Consideration of Alternatives (Volume 1 Chapter 4)
 - Onshore EIA: Socioeconomics (Volume 1 Chapter 13)
 - Offshore EIA: Socioeconomics (Volume 1 Chapter 18)
 - Socio-Economics and Tourism Technical Report (Volume 3 Appendix 18.1)
 - Implementation and Monitoring Plan

2. HRA DEROGATIONS GUIDANCE AND PRECEDENT

2.1. INTRODUCTION

55. This section provides an overview of the guidance and precedent relating to HRA Stages 3 and 4: No Alternative Solutions, IROPI and Compensatory Measures.

2.2. GUIDANCE

56. In preparing this Report a range of guidance has been reviewed and drawn upon, as listed below:

Scottish Guidance

- SNH (2010). SNH Guidance 'Natura sites and the Habitats Regulations. How to consider proposals affecting SACs and SPAs in Scotland. The essential quick guide'.
- DTA (2015) Habitats regulations appraisal of plans: Guidance for plan-making bodies in Scotland.
- Scottish Government (2015). Scotland's National Marine Plan: A Single Framework for Managing Our Seas.
- Scottish Government (2020a). Policy paper 'EU Exit: The Habitats Regulations in Scotland'.
- DTA Ecology (2021a: in draft). Policy guidance document on demonstrating the absence of Alternative Solutions and imperative reasons for overriding public interest under the Habitats Regulations for Marine Scotland.
- DTA (2021b) Framework to Evaluate Ornithological Compensatory Measures for Offshore Wind. Process Guidance Note for Developers. Advice to marine Scotland.

UK Guidance

- Defra (2012). Habitats Directive: guidance on the application of article 6(4).
- Defra (2021a) Habitats regulations assessments: protecting a European site
- Defra (2021b). Draft best practice guidance for developing compensatory measures in relation to Marine Protected Areas.
- DTA (2021) The Habitats Regulations Assessment Handbook.

EU Guidance

- EC (revised 2018). Managing Natura 2000 Sites (MN 2000): The provisions of Article 6 of the Habitats Directive 92/43/EEC.
 - EC (revised 2021). Guidance document on wind energy developments and EU nature legislation
 - EC (revised 2021). Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC and Annex (the EC Methodological Guidance);
57. The Scottish Government recently provided draft guidance on HRA stages 3 and 4, specifically for offshore wind in Scotland, to OWF developers for comment. This draft guidance is divided into Alternative Solutions and IROPI (DTA, 2021a: in draft) and compensation measures (DTA 2021b)¹¹.
58. This draft guidance is referenced in this Report; however, its status is currently unknown and no particular reliance is placed upon it. The draft DTA guidance is generally a

¹¹ The DTA guidance mostly refers to regulations 49 and 55 of the Conservation (Natural Habitats, &c.) Regulations 1994, but these essentially mirror regulations 29 and 36 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 referred to in this Report.

restatement of principles evident from European, UK and/or Scottish jurisprudence or guidance. As such, whilst the draft DTA guidance (if formalised) is a useful additional resource, it did not introduce new principles or concepts which are necessary to be relied upon in this case. If it is not subsequently adopted by the Scottish Government, the principles referred to and relied upon in this Report remain valid and supporting references have been provided where relevant.

2.3. EC OPINIONS

59. Where it is proposed to rely upon an HRA derogation concerning a European site hosting a priority habitat and/or a priority species, in certain circumstances it is necessary for EU member states to obtain an opinion from the EC¹². Following the UK's withdrawal from the EU, the UK is no longer subject to this requirement.
60. The EC has adopted and published a number of opinions on Article 6(4) derogation cases between 1996 and 2022¹³. These EC opinions have also been reviewed and considered; however each EC opinion is project and fact specific and none concern an OWF project. Furthermore, all of the opinions concern cases concerning priority habitat and/or priority species, which is not applicable in this case.

2.4. PLANNING PRECEDENT

61. To date no HRA derogation cases for an OWF in Scottish waters have been submitted to or relied upon by the Scottish Ministers. However, in the wider UK, there have been five OWF which have received consent pursuant to a derogation. None of these decisions has been subject to legal challenge on grounds relating to the approach taken for the HRA derogation.
62. In the absence of planning decisions for Scottish OWF which rely upon an HRA derogation, it is appropriate and useful to consider and refer to UK OWF planning decisions as a guide on the types of evidence and scenarios. These UK OWF planning decisions have been made under the same legal framework¹⁴, against the background of the same guidance set out above.
63. The five OWF derogation cases to date have been considered by the SofS for Business, Energy and Industrial Strategy (BEIS) and all concern OWF in the North Sea. These are:
 - Hornsea Three OWF (Hornsea Three) (BEIS, 2020);
 - Norfolk Boreas OWF (Norfolk Boreas) (BEIS, 2021);
 - Norfolk Vanguard OWF (BEIS 2022);
 - East Anglia ONE North OWF (BEIS 2022); and
 - East Anglia TWO OWF (BEIS 2022).
64. There is one other OWF application which has presented a “without prejudice” derogation case (Hornsea Four, also in the North Sea, off the East Coast of England). A decision by the SofS on the Hornsea Four consent application is expected in February 2023.
65. The most recent example of an offshore wind related HRA derogation case is The Crown Estate's plan-level HRA for its Round 4 offshore wind leasing process. Following completion of its AA, The Crown Estate (TCE) concluded there was a risk of an AEOL with regards to the kittiwake feature of the Flamborough and Filey Coast SPA in-combination, and the

¹² An EC opinion is required unless the IROPI relate to human health or public safety or to beneficial consequences of primary importance for the environment.

¹³ [Management of Natura 2000 sites: Guidance - Environment - European Commission \(europa.eu\)](https://ec.europa.eu/nature/management/natura-2000/sites/guidance-environment-european-commission/europa.eu)

¹⁴ Conservation of Offshore Marine Habitats and Species Regulations 2017 and the Conservation of Habitats and Species Regulations 2017.

sandbanks feature of the Dogger Bank SAC, alone or in-combination. As such, TCE prepared an HRA derogation case which was subsequently approved by BEIS allowing the Round 4 plan to proceed.

66. A summary of applications which have included an HRA derogation cases is provided in Table 6. Each example demonstrates how the HRA Derogation Provisions and associated guidance can be relied upon to consent OWFs (plan or project level), notwithstanding the identification of AEOL.

Table 6 OWF Derogation Cases relevant to The Proposed Development

Type	Name	Nature of Relevant Site/Feature	Timescales
OWF	Hornsea Three	Kittiwake at Flamborough and Filey Coast SPA Sandbanks at North Norfolk Sandbanks and Saturn Reef SAC Sandbanks at Wash and North Norfolk Coast SAC	Planning granted on 31 December 2020
OWF	Norfolk Boreas	Kittiwake at Flamborough and Filey Coast SPA Lesser black-backed gull at Alde-Ore Estuary SPA Sandbanks and reef at Haisborough, Hammond and Winterton SAC	Planning granted on 20 December 2021
OWF	Norfolk Vanguard	Kittiwake at Flamborough and Filey Coast SPA Lesser black-backed gull at Alde-Ore Estuary SPA Sandbanks and reef at Haisborough, Hammond and Winterton SAC	Planning granted on 11 February 2022
OWF	East Anglia ONE North	Kittiwake at Flamborough and Filey Coast SPA Lesser black-backed gull at Alde-Ore Estuary SPA Red-throated diver at Outer Thames Estuary SPA	Planning granted on 31 March 2022
OWF	East Anglia Two	Kittiwake at Flamborough and Filey Coast SPA Lesser black-backed gull at Alde-Ore Estuary SPA Red-throated diver at Outer Thames Estuary SPA	Planning granted on 31 March 2022
OWF	Hornsea Four	Kittiwake, Guillemot and Razorbill at Flamborough and Filey Coast SPA	Examination completed on 22 August 2022
Plan	Round Four Plan Level Derogation Case	Kittiwake at Flamborough and Filey Coast SPA Sandbanks at Dogger Bank SAC	Derogation Case adopted in April 2022, and Round 4 leasing process progressing.

3. SUMMARY OF NEED CASE

3.1. INTRODUCTION

67. As will be seen in Part B and Part C of this Report, HRA Stages 3A (Alternative Solutions) and 3B (IROPI) are intertwined with and framed by the need for a given project. It is convenient to address the topic of need at this stage, to inform and limit later repetition in Parts B and C of this Report.
68. The factors which support and define the clear and urgent need case for The Project are set out comprehensively in the Applicant's Statement of Need and Offshore Planning Statement and are only summarised below.
69. In short, the need case is predicated upon the critical contribution of The Project to four important pillars of energy policy:
1. Decarbonisation, to achieve "Net Zero" as soon as possible, to mitigate climate change;
 2. Security of supply: geographically and technologically diverse supplies;
 3. Affordability, energy at lowest cost to consumers;
 4. Action before 2030: time is of the essence, meaning early deployment, at scale, is critical (owing to 1 – 3 above).

3.2. CLIMATE CHANGE, NET ZERO AND DECARBONISATION

THE CLIMATE EMERGENCY

70. Climate change is the defining challenge of our time. The impacts of climate change are global in scope and unprecedented in human existence.
71. The United Nations (UN) has been leading on global climate summits ('Conference of the Parties', COP) for nearly three decades. International consensus on the need to tackle climate change is reflected in The Paris Agreement¹⁵, adopted at COP21 in 2015 by 196 parties to the UN Framework Convention on Climate Change. For the first time it created a legally-binding, international agreement towards tackling climate change. The UK (and hence Scotland) is legally bound to the Paris Agreement. The member governments agreed:
- A long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels;
 - To aim to limit the increase to 1.5°C since this would significantly reduce risks and the impacts of climate change;
 - On the need for global greenhouse gas (GHG) emissions to peak as soon as possible; and
 - To undertake rapid reductions thereafter in accordance with the best scientific guidance available.
72. This international ambition underpins subsequent Scotland and UK legislation on climate change mitigation, addressed below.
73. However, despite action to date, human-induced warming has reached approximately 1°C above pre-industrial levels, as confirmed by the recent Inter-Governmental Panel on Climate Change (IPCC) 6th Assessment Report (the AR6 Report), published in three parts across 2021 and 2022. The AR6 Report is the first major review of the science of climate

¹⁵ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

change since 2013 and is addressed in further detail in the Applicant's Planning Statements and Statement of Need. Some of the key messages are as follows:

- Without immediate, rapid and large-scale reductions in GHG, limiting warming close to 1.5°C or even 2°C will be beyond reach.
- Delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future.
- Limiting warming to around 1.5°C requires global GHG emissions to peak before 2025 at the latest, and be reduced by 43% by 2030
- Limiting global warming will require major transitions in the energy sector. This will involve a substantial reduction in fossil fuel use, widespread electrification, improved energy efficiency and use of alternative fuels.

74. Thus, a key theme of the AR6 Report is that humanity is not on track to limit warming to the extent necessary, but that it is still just about possible to make the necessary progress by 2030 by, for example, moving rapidly to non-fossil fuel sources of energy. The next few years are critical.

NET ZERO

75. The Scottish Government has recognised the gravity of the situation described above. Scottish First Minister Nicola Sturgeon declared a "Climate Emergency" in her speech to the SNP Conference in April 2019. Climate Change Secretary Roseanna Cunningham subsequently made a statement to the Scottish Parliament on 14 May on the 'Global Climate Emergency' and said:

*"There is a global climate emergency. The evidence is irrefutable. The science is clear and people have been clear: they expect action. The Intergovernmental Panel on Climate Change issued a stark warning last year - the world must act now. **By 2030 it will be too late to limit warming to 1.5 degrees.**" [emphasis added].*

76. An emergency is, by definition, a grave situation that demands an urgent response.
77. In Scotland and the UK legal obligations to achieve Net Zero, to mitigate climate change, have accordingly been strengthened in recent years as follows:
- Scotland: the Climate Change (Scotland) Act 2009 was amended by the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019; and
 - UK: the Climate Change Act 2008 was amended by the Climate Change Act 2008 (2050 Target Amendment) Order 2019.

78. The Scottish and UK Governments are now legally bound to reach Net Zero (i.e. ensure that their respective net carbon account is at least 100% lower than the 1990 baseline) by 2045 in Scotland and by 2050 in the UK.

79. Challenging interim 'stepping-stone' targets are also in place. Scotland has interim targets of a 75% reduction target by 2030 and 90% by 2040. The 75% target by 2030 is especially challenging. The Committee on Climate Change (CCC) modelled five scenarios in CB6 and none – even the optimistic scenario – shows Scotland achieving a 75% emissions reduction by 2030. The CCC has therefore stated:

"Scotland's 75% target for 2030 will be extremely challenging to meet, even if Scotland gets on track for net zero by 2045. Our balance net zero pathway for the UK would not meet Scotland's 2030 target – reaching a 64% reduction by 2030 – while our most stretching tail winds scenario reaches a 69% reduction".

80. COP26 was held in Glasgow in November 2021, allowing Scotland to demonstrate international leadership on climate change. COP26 recognised the urgent need to further reduce emissions before 2030 and parties made a commitment to revisit and strengthen their current emissions targets to 2030, in 2022. Agreements made at COP26 were detailed

in the Glasgow Climate Pact (UNFCCC, 2021¹⁶). Paragraph 17 states that “*rapid, deep and sustained reductions in global greenhouse emissions*” are required to limit temperature increase to 1.5°C above pre-industrial times.

81. The twenty seventh COP (COP27) took place in Sharm el-Sheikh in November 2022. The COP expressed “*alarm and utmost concern that human activities have caused a global average temperature increase of around 1.1 °C above pre-industrial levels to date and that impacts are already being felt in every region and will escalate with every increment of global warming*”¹⁷ and agreed a package of decisions¹⁸ which reaffirmed their commitment to limit global temperature rise to 1.5°C above pre-industrial levels. However, it was acknowledged that current policies and actions are insufficient to achieve that objective.
82. The backdrop to COP27 was a report from UN Climate Change¹⁹, which indicates that implementation of current pledges by national governments put the world on track for a 2.5°C warmer world by the end of the century. Therefore, despite some notable breakthroughs, such as an agreement to provide “loss and damage” funding for vulnerable countries hit hardest by climate disasters, in his closing remarks, Simon Stiell, UN Climate Change Executive Secretary, reminded delegates that the 2020s are a critical decade for climate action. Governments were tasked with revisiting and strengthening the 2030 targets in their national climate plans by the end of 2023, as well as accelerate efforts to phasedown unabated coal power and phase-out inefficient fossil fuel subsidies.
83. In the field of energy, the Sharm el-Sheikh Implementation Plan²⁰ repeated “*the urgent need for immediate, deep, rapid and sustained reductions in global greenhouse gas emissions ...across all applicable sectors, including through increase in low-emission and renewable energy*,”. However, the Implementation Plan also recognised the importance of energy security of supply. It described an “*unprecedented global energy crisis*” which “*underlines the urgency to rapidly transform energy systems to be more secure, reliable, and resilient, including by accelerating clean and just transitions to renewable energy during this critical decade of action*”. This energy security of supply crisis underscores the importance of “*enhancing a clean energy mix, including low-emission and renewable energy, at all levels as part of diversifying energy mixes and systems, in line with national circumstances and recognizing the need for support towards just transitions*”.
84. In effect, the Scottish and UK Governments, in common with COP, have agreed that, beyond their own national targets, more must and can be done. This implies a greater target capacity of carbon-neutral power supply than currently pledged and a more rapid timeline for decarbonisation wherever possible.

DECARBONISATION

85. Decarbonisation is the act of reducing the carbon footprint (primarily in the form of GHG) arising from the use of energy in society, to reduce the warming impact on the global climate.
86. The adoption of Net Zero commitments as described above requires a substantial reduction in the carbon emissions from transport, heat and industrial emissions.
87. This is reflected in Scottish and UK policy. The Scottish Energy Strategy (2017) establishes targets for 2030 to supply the equivalent of 50% of the energy for Scotland’s heat, transport and electricity consumption from renewable sources; and to increase by 30% the productivity of energy use across the Scottish economy (Scottish Government, 2017).

¹⁶ [Glasgow Climate Pact | UNFCCC](#)

¹⁷ Decision -/CP.27, November 2022, *Second periodic review of the long-term global goal under the Convention and of overall progress towards achieving it*.

¹⁸ [Decisions taken at the Sharm El-Sheikh Climate Change Conference - Advance unedited versions | UNFCCC](#).

¹⁹ [Climate Plans Remain Insufficient: More Ambitious Action Needed Now | UNFCCC](#).

²⁰ Decision -/CP.27, November 2022.

Similarly, the UK Clean Growth Strategy (BEIS 2017) provides measures to decarbonise all sectors of the UK economy through the 2020s and beyond.

88. However, while multiple pathways for the energy mix could achieve the previous 80% C-reduction target, Net Zero leaves a narrower choice of pathways which will lead to success²¹ and there is presently a gap between ambition and reality.

AMBITIONS VS REALITY GAP

89. Figure 1 below shows the gap in carbon emissions between current global decarbonisation policies, current pipelines and pledges, and (in green) the pathway required to be followed to ensure that global warming does not increase over 1.5C by 2100.

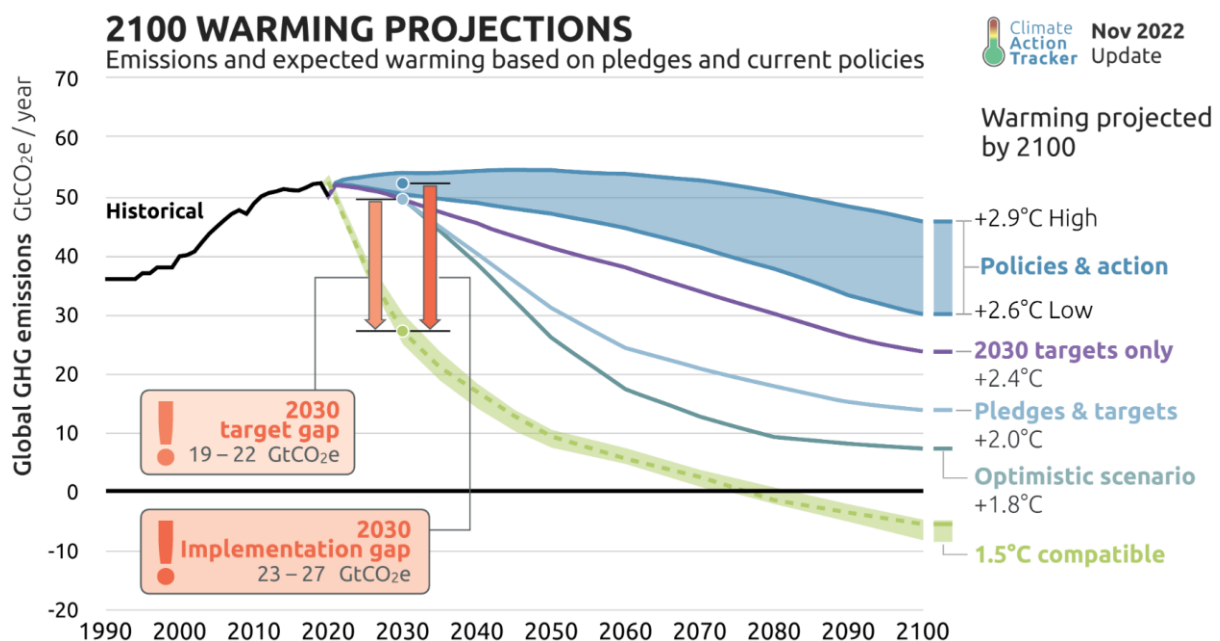


Figure 1 Global 2100 Warming Projections²²

90. The world is lagging in decarbonisation progress and because carbon has a cumulative warming effect, targets associated with decarbonisation have correspondingly increased year-on-year. Therefore, although Scotland and the UK are leading decarbonisation efforts, their respective legal commitments of achieving Net Zero by 2045 and 2050 respectively are not assured. The climate challenge is such that there is currently no limit or cap to the benefit that single countries can bring in the fight against global warming.

THE NEED FOR ADDITIONAL ELECTRICITY GENERATING CAPACITY

91. Electricity generation is an important sector for climate change because, although historically a significant carbon emitter, it is now the critical enabler of deep decarbonisation across society. The decarbonisation of electricity is critical for Net Zero to be achieved and deeper decarbonisation requires deeper electrification.
92. Figure 2 below shows how National Grid's Future Energy Scenarios electricity demand forecasts for GB have evolved from 2012 through to 2022.

²¹ National Grid Future Energy Scenarios, 2021 et al

²² [Temperatures | Climate Action Tracker](#)

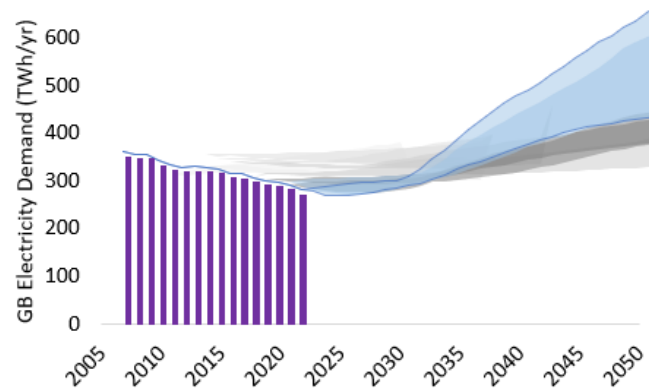


Figure 2 Future Energy Scenarios demand forecasts 2012-2022²³

93. Historical annual GB electricity demand is represented by the purple columns (declining with de-industrialisation and energy efficiency measures) and each yearly forecast is represented by a shaded area which shows the max and min forecast range per year for those scenarios which are compatible with Net Zero 2050.
94. Following the 2019 enshrinement into law of the Net Zero commitments, the 2020 and 2021 forecasts show a significant uplift versus previous year forecasts and are coloured blue for emphasis. The most recent forecast is bordered with a thin blue line.
95. Important points to note from Figure 2 are:
- Each year the forecast for electricity demand has increased, as the need to decarbonise has grown.
 - Deeper decarbonisation draws power from other primary fuels (carbon intensive) to electricity which may, and needs, to be generated from low-carbon sources.
 - Since Scotland and the UK committed to Net Zero, forecast future electricity demand has increased significantly and is now as high as it ever has been.
96. UK government forecasts for electricity demand in the 2050 timeframe use the value of 600TWh/year – double today's consumption – and this includes Scottish demand²⁴.

THE NEED FOR ADDITIONAL OFFSHORE WIND DEPLOYMENT, AT SCALE

97. The UK has plentiful wind resource. Therefore, a significant focus of Scottish and UK energy policy is the vital role and need for rapid large-scale deployment of GWs of offshore wind. The policy is detailed fully in the Applicant's Offshore and Onshore Planning Statements and Statement of Need but include:
- **Revised National Planning Framework 4**²⁵ – offshore wind developments proposed in excess of 50MW are categorised as "national development" (Strategic Renewable Electricity Generation and Transmission Infrastructure), the need for which is assumed.
 - **Offshore Wind Policy Statement**²⁶ – sets an ambition for up to 11 GW of OWF by 2030;

²³ National Grid ESO Future Energy Scenarios series, 2012-2022.

²⁴ UK Government's Energy White Paper, 2020.

²⁵ Scottish Government, November 2022.

²⁶ Scottish Government, October 2020.

- **Scotland's Energy Strategy Position Statement**²⁷ – identifies offshore wind as a major component of Scottish energy strategy from the perspective of being an important low-carbon primary energy generator and from the perspective of continuing to develop world-leading support and development services to the global offshore wind industry.
- **Scotland Sectoral Marine Plan for Offshore Wind**²⁸ - identifies 15 Plan Option areas, split across 4 regions in Scottish waters, capable of generating up to 10 GW of renewable energy.
- **Scotland's National Marine Plan** (2015) - includes the objectives of sustainable development of offshore wind in suitable locations, to contribute to achieving the decarbonisation target by 2030
- **HM Government British Energy Strategy** (2022) targeting 50 GW offshore wind by 2030
- **Net Zero Strategy for the UK** (HM Government, 2021a),
- **Build Back Greener** (HM Government, 2021a) goes on to take action so that by 2035, all the UK's electricity will come from low carbon sources, including offshore wind;
- **UK Offshore Wind Sector Deal** (BEIS 2019)
- **Energy White Paper** (HM Government, 2020b);
- **National Policy Statements** (NPS) for England and Wales and draft NPS (EN-1, EN-3, EN-5)²⁹.
- **Electricity System Operator National Grid ESO: Future Energy Scenarios** requirement for 38 – 47 GW offshore wind in 2030, 68 – 83 GW in 2040, and 87 – 113 GW by 2050³⁰.

98. In short, the need for a massive amount of additional offshore wind capacity is a very strong and constant theme of all extant Scottish and UK energy policy.
99. National Grid's Future Energy Scenarios contemplates the requirement for offshore wind (and other technologies) required to meet the forecast growth in electricity demand. Figure 3 below shows the forecast capacity of offshore wind from National Grid's Future Energy Scenarios, with the same format protocol as shown in Figure 2 above.

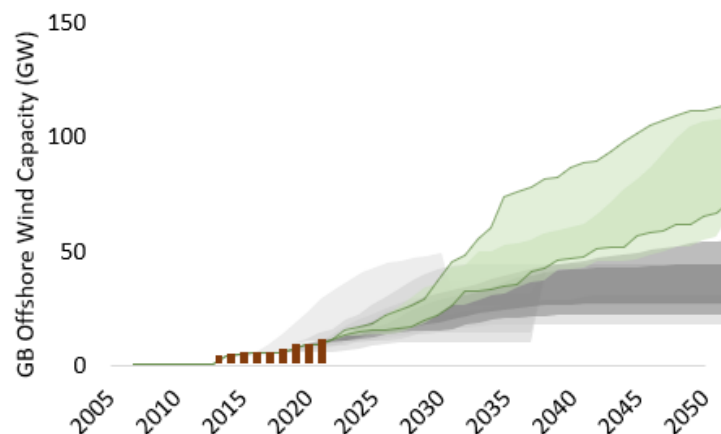


Figure 3 Future Energy Scenarios offshore wind capacity forecasts 2012-2022³¹

100. Key points to note from Figure 3 are:
- Although the UK is leading the world in offshore wind, the currently installed capacity is significantly lower than it needs to be according to National Grid future energy scenarios.
 - Since Net Zero, offshore wind is expected to play an enormous part in meeting the electricity needs of the UK in the future.

²⁷ Scottish Government, 2021.

²⁸ Scottish Government, October 2020

²⁹ DECC, 2011 and BEIS 2021.

³⁰ National Grid, 2021.

³¹ National Grid ESO Future Energy Scenarios series, 2013-2021.

- In every scenario, a pathway to Net Zero includes a significant increase of offshore wind capacity (beyond that predicated in the Offshore Wind Sector Deal).
 - Even “low-case” projections for offshore wind deployment – in which Net Zero will be met only if “hi-cases” for other technologies such as nuclear, CCUS, solar and onshore wind are met – represent a significant growth in installed capacity from today onwards.
101. Importantly, these offshore wind projections need to be read and pursued in the knowledge that there is attrition during project development and not all proposed offshore wind projects reach commercial operation, and some do so at reduced scale, or later than planned. Therefore, consenting a much larger offshore wind capacity than provided for in the various targets, as quickly as possible, is necessary to meet Net Zero.
102. In its 2021 progress report³², the CCC emphasised that to achieve Net Zero requires a *“rapid scale up in low carbon investment.....and speed up the delivery which will need to accelerate even where ambition is broadly on track. For example, although the Government’s 2030 target for offshore wind is in line with the CCC pathway, a minimum of 4 GW of additional offshore wind capacity will be needed each year from the mid-2020s onwards, significantly greater than the current 2 GW per year”*. It should be noted that the target referred to in the above extract is the previous target of 40GW by 2030, which suggests that more than 4GW per year growth in offshore wind capacity is required from the mid-2020s to achieve the 50GW target.
103. In conclusion, a massive increase in energy generation from offshore wind is important to reduce electricity-related emissions, and to provide a timely next-step contribution to a future generation portfolio which is capable of supporting the massive increase in electricity demand, which is expected because of decarbonisation through-electrification of transport, heat and industrial demand.

3.3. SECURITY OF SUPPLY

104. Energy security is a key pillar of energy policy at Scottish, UK and EU levels.
105. Although Scotland has its own decarbonisation targets, the connectedness of the electricity systems across Great Britain means that security of supply and decarbonisation of the electricity sector need to be considered at the GB level. The electricity systems of Scotland, Wales and England are essentially one system.
106. Security of supply means keeping the lights on. That entails, amongst other things, ensuring that there is enough electricity generation capacity available to meet maximum peak demand (not just average demand), and with a safety margin or spare capacity to accommodate unexpectedly high demand and to mitigate risks such as unexpected plant closures and extreme weather events.
107. And while technologies such as batteries or hydrogen will ensure that peak demand is met by storing energy at times of oversupply and discharging it at times of overdemand, more renewable generation capacity is required to meet demand than would be required of conventional generation, because of its intermittent nature.
108. Recent European events have challenged the UK’s prevailing view on and approach to energy security, in particular UK dependency on foreign hydrocarbons. The British Energy Security Strategy (BESS), which applies across GB, was published by BEIS following concerns over the security of international hydrocarbon supplies and increasingly volatile international markets in early 2022.
109. Reducing the UK’s dependency on hydrocarbons is already essential for decarbonisation but recent world events have brought into sharp focus that reducing dependency on foreign hydrocarbons has important security of supply, electricity cost and fuel poverty avoidance

³² CCC, 2021

benefits. Actions already urgently required in the fight against climate change are now required even more urgently for global political stability and insulation against dependencies on other nation states.

110. The UK imports 100 Million Tonnes of Oil Equivalent (MTOE) of coal, oil and gas each year. Of this, approximately 8 MTOE arrives from Russia. 8 MTOE is equivalent to approximately 93 TWh of energy³³. 8 MTOE is equivalent to approximately 93 TWh of energy³⁴.
111. 1 GW of offshore wind, at a conservatively assumed load factor of 48%, has the potential to generate 4.2TWh/year, or 4.5% of Russian energy imports averaged over 2019/2020. This metric also demonstrates the enormous challenge ahead to achieve national independence on Russian energy imports. The equivalent of 5 x Berwick Banks are needed to remove the need for any energy imports from Russia.
112. A diverse mix of all types of power generation helps to ensure security of supply, however a low-cost, net zero consistent system is likely to be composed predominantly of wind and solar³⁵. The diversification of the GB's electricity supplies through the commissioning of offshore wind assets to the NETS, alongside other low carbon generation technologies, provides benefits in the functioning of the NETS and ensuring power is available to consumers across the country when it is required, due to its requirement to operate within the stringent operability and control requirements of the Grid Code³⁶.
113. As part of a diverse generation mix, wind generation contributes to improve the stability of capacity utilisations among renewable generators. By being connected at the transmission system level, large-scale offshore wind generation can and will play an important role in the resilience of the GB electricity system from an adequacy and system operation perspective. Further generation of offshore wind in Scotland will avoid the need for more / extended imports of electricity from the wider UK to meet its growing electricity demand. It will also ensure a lower carbon content of electricity owing to Scotland being further ahead than the wider UK in decarbonising its electricity supply.
114. This demonstrates how offshore wind has, and must continue to contribute, to security of supply for GB consumers through being a dependable supply of low carbon power. Further details are set out in the Applicant's Statement of Need.

3.4. AFFORDABILITY

115. In Just Transition: A Fairer, Greener Scotland³⁷, the Scottish Government identified its priority to achieve a "just transition" to Net Zero, that is to deliver the desired outcome – a net zero and climate resilient economy – in a way that delivers fairness and tackles inequality and injustice.
116. The UK and especially Scotland has plentiful wind resource and costs are competitive versus other technologies, which is an important factor in ensuring affordability for consumers. This is reflected in the Offshore Wind Policy Statement³⁸, which states (page 2):

"Offshore wind is one of the lowest cost forms of electricity generation at scale, offering cheap, green electricity for consumers, with latest projects capable of generating power at below wholesale electricity prices."

³³ BEIS, Digest of UK Energy Statistics, DUKES 2021.

³⁴ BEIS, Digest of UK Energy Statistics, DUKES 2021.

³⁵ HM Government. Energy White Paper: Powering our Net Zero Future. 2020.

³⁶ National Grid plc. Grid Code, National Grid Electricity Transmission plc. National Grid plc, Warwick [online], 2014.

³⁷ Scottish Government, September 2021.

³⁸ Scottish Government, October 2020.

117. Cost reduction and affordability have been particularly important in the development of OWF development. UK policy and regulatory objectives seek to ensure affordability to consumers, through the Contract for Difference (CfD) auction process (generation assets) and Offshore Transmission Owner regime (offshore transmission assets).
118. In broad terms, both seek to incentivise investment in low carbon electricity generation and transmission assets, ensure security of supply and help the UK meet its carbon reduction and renewables targets, whilst reducing cost to the consumer.
119. The CfD mechanism plays a very important role in bringing forwards new large-scale low carbon generation, and Allocation Round 4 (AR4) contracts awarded in the summer of 2022 provide an indicator of the importance of wind as a technology class within the GB electricity system, and an indicator of the competitive cost of the technology: over 8.5GW of wind capacity across 22 projects secured Contracts for Difference in AR4, at an initial strike price ranging from £37.35/MWh (Offshore Wind) to £87.30/MWh (Floating Offshore Wind). All CfDs commence in either 2024/25 (Onshore Wind) or 2026/27 (all Offshore Wind technologies).
120. As a result, Scottish and UK OWF projects are increasing in capacity, and decreasing in unit cost. Hitherto, each subsequent project has provided a real-life demonstration that size and scale works for new offshore wind, for the benefit of consumers. Other conventional low-carbon generation (e.g. tidal, nuclear or conventional carbon with Carbon Capture, Utilisation and Storage) remain important contributors to achieving the 2050 Net Zero obligation, but their contributions will not be significant in the 2020s due to the associated technical, commercial and development timeframes.
121. For the reasons summarised above, the economic and technical competitiveness for offshore wind makes it the preferential power supply to the Scotland and GB electricity consumer. Further details are set out in the Applicant's Statement of Need.

3.5. THE NEED FOR ACTION BEFORE 2030

122. Both the Scottish Energy Strategy³⁹ and the UK Net Zero Strategy⁴⁰ make a case for a low or no regrets approach to decarbonisation. This framework, set by the Nation Engineering Policy Centre (2017) promotes rapid decision making in net zero policy in order to make urgent progress.
123. The Scottish Energy Strategy thus sets a 2030 target to supply the equivalent of 50% of the energy for Scotland's heat, transport and electricity consumption from renewable sources; and to increase by 30% the productivity of energy use across the Scottish economy. Scotland's Offshore Wind Policy Statement in turn sets an ambition (but not limit) for **11 GW** of offshore wind capacity in operation in Scottish waters **by 2030**.
124. There is good reason for this focus on near-term action before 2030. The need for decarbonisation grows stronger each year. Every year during which no action is taken, more carbon is released into the atmosphere, global temperatures rise and the global warming effect accelerates. A rise in global temperatures above 1.5°C has potential to cause irreversible climate change, the potential for widespread loss of life and severe damage to livelihoods.
125. Therefore, early action, during the 2020s, will have a correspondingly more beneficial impact on our ability to meet Net Zero targets than later action.
126. In June this year the International Energy Agency issued a call to arms on energy innovation, stating that the world *"won't hit climate goals unless energy innovation is rapidly accelerated... About three-quarters of the cumulative reductions in carbon emissions to get*

³⁹ Scottish Government, 2017

⁴⁰ HM Government 2021

on [a path which will meet climate goals] will need to come from technologies that have ‘not yet reached full maturity’⁴¹. DNV GL expressed this observation in a different way: “Measures today will have a disproportionately higher impact than those in five to ten years’ time”⁴².

127. Time is of the essence and action during the 2020s is critical.

3.6. ROLE OF AND NEED FOR THE PROJECT

128. Against the backdrop outlined above, the need for and benefits of the Project are manifest and include:

- With the potential to generate an estimated 4.1GW, the Project is a substantial infrastructure asset, capable of delivering huge amounts of low-carbon electricity – enough to power more than 5 million homes each year, starting from as early as 2026.
- The Project would deliver a substantial near-term contribution to decarbonisation, helping to reduce GHG emissions, by offsetting millions of tonnes of CO₂ emissions per annum from 2026.
- More than 4.1GW of OWF capacity is required in Scotland and the wider UK to meet policy aims and legal targets for 2030. Any capacity not developed at the Project will need to be made up elsewhere and will not be on stream as quickly (most likely after 2030).
- Decarbonisation is urgent. The scale of and timelines associated with The Project align with that urgency. The 2030 ambition gap will be closed only by bringing forward projects like The Project which connect as much capacity as possible, as early as possible.
- The Project is the only Scottish offshore wind project of significant scale which is proposed to commission between 2025 and 2030 (with the exception of 0.8GW from a recent ScotWind lease winner, currently hoped to commission in 2029).
- The Project can “plug the gap” between Scottish CfD Auction Round 3 (AR3) wind farm developments (coming online in the next three years) and ScotWind developments (which are mostly likely to start to come on stream from the 2030s onwards).
- Development of The Project is well advanced and there is a high degree of certainty attached to its deliverability for a number of reasons including:
 - The seabed at The Project is shallower and closer to shore than seabed areas in other proposed OWF locations (e.g. ScotWind);
 - The shallow seabed allows for a fixed bottom turbines to be used, a tried and tested foundation solution which can be developed at lower cost than floating technology;
 - The seabed at The Project is well surveyed and understood; and
 - The established track record of the promoter, SSE, in delivering offshore wind in Scottish and UK waters.
- The Project’s location (shallow waters), design (fixed bottom turbines) and large scale (4.1GW):
 - supports UK electricity system adequacy to help meet peak electricity demand, dependability and security of supply requirements; growth in offshore wind capacities, is expected to improve the dependability of those assets as a combined portfolio, and to reduce further any integration costs associated with such growth;
 - enables efficiencies and reduce costs, ensuring affordability for the GB consumer
 - brings forward an important near-term opportunity for supply chain investment in Scotland
- If developed at its full technically achievable capacity, The Project would provide enough energy to replace 19% of Russian gas imports to the UK. This demonstrates the significant national benefit to energy security provided by a fully developed The Project scheme.

⁴¹ IEA. Reaching international energy goals. IEA News, 2020.

⁴² DNV GL. Energy Transition Outlook Power Supply & Use. 2020.

- The Project's two separate points of connection are also beneficial from both system reinforcement and system operability cost perspectives.

129. For all these reasons, The Project is an essential part of the future generation mix. Without The Project, it is probable that delivery of the multitude of policies will fall short, including: the Scotland Sectoral Marine Plan, Scottish Energy Strategy, the Ten Point Plan, UK Net Zero Strategy and UK Offshore Wind Sector Deal, as well as the targets set by the Climate Change (Scotland) Act 2009, Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, the (UK) Climate Change Act 2008 (as amended) and the Net Zero Strategy: Build back Greener.

PART B: NO ALTERNATIVE SOLUTIONS

4. INTRODUCTION TO THE ASSESSMENT OF ALTERNATIVES

4.1. OVERVIEW

130. This PART B addresses HRA Stage 3A (no alternative solutions). It examines whether there are any feasible alternative solutions to The Project. A range of potential alternatives have been considered. These range from “doing nothing”, to alternative sites, designs, scales and methods of operation.
131. The conclusion reached is that there are no feasible alternative solutions to The Project.
132. The analysis set out in this Part B is supported by and draws in particular upon the following documents which accompany the Section 36 Consent and Marine Licence applications for the Proposed Development:
- Statement of Need (summarised in Section 3 above)
 - Offshore Planning Statement
 - Offshore EIA: Project Description (Volume 1 Chapter 3)
 - Offshore EIA: Site Selection and Consideration of Alternatives (Volume 1 Chapter 4)

4.2. APPROACH TO STAGE 3A: ALTERNATIVE SOLUTIONS

INTRODUCTION

133. The Habitat Regulations do not define the concept of “no alternative solutions” or the parameters of the exercise, and there is limited case law at the UK and EU level. Therefore, the approach adopted by the Applicant primarily draws upon relevant Scottish (DTA 2021: draft), UK (Defra 2012) and EC guidance (MN 2000 and the EC’s Methodological Guidance) and precedent from previous UK OWF derogation decisions, as detailed further below.

PROJECT OBJECTIVES – STEP 1

134. A consistent theme of guidance⁴³ and previous OWF derogation planning decisions, is that possible alternative solutions must achieve the core objectives of the Proposed Development.
135. In this regard, EC MN 2000 provides [underlining added]: “*it is for the competent national authorities to ensure that all feasible alternative solutions that meet the plan/project aims have been explored to the same level of detail.*” The EC’s Methodological Guidance reflects MN 2000 and suggests a three step approach for examining the possibility of alternative solutions, the first step being to identify the key objectives of the project in question.
136. This approach has also been endorsed by the English High Court in *Spurrier*⁴⁴, which commented as follows [underlining added]:
- “Even by itself, the noun “alternative” carries the ordinary, Oxford English Dictionary meaning of “a thing available in place of another”, which begs the question what are the relevant objectives or purposes which an alternative would need to serve. However, article 6(4) does not refer simply to the absence of an “alternative” but to an “alternative*

⁴³ Marine Scotland (DTA, 2021: in draft), Defra 2012 and MN 2000 and EC Interpretive Guidance.

⁴⁴ *Spurrier, R (On the Application of) v The Secretary of State for Transport* [2019] EWHC 1070 (Admin).

solution", "alternative" appearing as an adjective, which makes this meaning plain beyond any doubt. In our view, "an alternative" must necessarily be directed at identified objectives or purposes; but it is beyond doubt that "an alternative solution" must be so aimed.⁴⁵

137. This approach was also endorsed by the Court of Appeal in *R (Plan B Earth) v Secretary of State for Transport*⁴⁶:

"Under the Habitats Directive, if a suggested alternative does not meet a central policy objective of the project or plan in issue, then it is no true alternative and will properly be excluded. It is not then, and cannot be, an "alternative solution". In short, the Habitats Directive has a determining effect on the inclusion or exclusion of alternatives."

138. Defra 2012 similarly states that alternative solutions are "limited to those which would deliver the same overall objective as the original proposal". In making this point, it uses the example of an OWF:

*"For example, in considering alternative solutions to an offshore wind renewable energy development the competent authority need only consider alternative offshore wind renewable energy developments. Alternative forms of energy generation are not alternative solutions to this project as they are beyond the scope of its objective. Similarly, alternative solutions to a port development will be limited to other ways of delivering port capacity, and not other options for importing freight."*⁴⁷

139. Defra's 2021 guidance echoes this advice: "Examples of alternatives that may not meet the original objective include a proposal that...offers nuclear instead of offshore wind energy".
140. Finally, Defra's 2012 guidance makes the obvious but important point that documents setting out Government policy provide important context for a competent authority when considering the scope of alternative solutions that require to be considered.
141. In conclusion, the first step is to identify the core objectives of The Project. These core objectives respond to and must be understood in the context of the policy context and need case which The Project serves, as set out in Section 3 of this Report. It is noted that a similar approach has been followed in all UK OWF HRA derogation cases to date and as illustrated in below.

DO NOTHING – STEP 2

142. A second consistent theme of HRA guidance⁴⁸ is that a "do nothing" or "zero option" should be considered, i.e. the outcome of not proceeding with the project at all.
143. For example, MN 2000 states: "Crucial is the consideration of the 'do nothing' scenario, also known as the 'zero' option, which provides the baseline for comparison of alternatives."⁴⁹ DTA 2021 (in draft) similarly suggests it allows a baseline from which to gauge other alternatives and provides a different viewpoint from which to understand the need for the proposal.
144. The English courts⁵⁰ have cast doubt on the proposition that "do nothing" is a true alternative, though it was recognised by the judge that whether there are IROPI clearly raises the question of whether it is better to do nothing. The do nothing option would fail to

⁴⁵ *Spurrier*, at paragraph 334.

⁴⁶ 2020] EWCA Civ 214 at para 116

⁴⁷ At paragraph 10.

⁴⁸ Marine Scotland (DTA, 2021: in draft), Defra 2012 and MN 2000 and EC Interpretive Guidance.

⁴⁹ MN 2000, section 3.3.1 at page 68.

⁵⁰ *Humber Sea Terminal Ltd v Secretary of State for Transport and another* [2005] EWHC 1289 (Admin), comments at paragraph 84.

achieve any core objectives of a given project and would immediately be discounted where it is clear there are IROPI to proceed with a given project.

145. However, for completeness, and given reference to it in pre-existing guidance, the “do nothing” option is considered in this Report. This is consistent with the approach adopted by the SofS in the five UK OWF derogation decisions taken to date.

IDENTIFY FEASIBLE ALTERNATIVE SOLUTIONS – STEP 3

146. If the “do nothing” option is discounted, the next step is to identify any/ all feasible alternative solutions that meet the core project objectives and would avoid or be materially less damaging for the European site(s) in question, whilst also not resulting in AEOI for another (unaffected) European site.
147. Again, all guidance is aligned in indicating that this could (subject to the core project objectives) theoretically include consideration of different location(s), scale(s), design(s) of development or alternative operational processes. However, there are practical limitations to this exercise.
148. At this point it is relevant to note that in each of the five previous OWF HRA derogation decisions, the SofS concluded that alternative forms of energy generation would not meet the core objectives for the proposed OWF and that alternatives can consequently be limited to either “do nothing” or “alternative wind farm projects”⁵¹. This reflects Defra’s 2012 and 2021a guidance and has not been subject to legal challenge, and is therefore adopted in this Report.
149. European Court of Justice (ECJ) case law confirms that hypothetical options can be discounted⁵². MN 2000 similarly makes clear that the consideration of alternative solutions should be limited to “feasible” alternative solutions. Defra 2021a helpfully explains that a potential alternative should be: “financially, legally and technically feasible”.
150. Guidance does not define or illustrate the boundaries of ‘financial’, ‘legal’ or ‘technical feasibility’. However, logically, a potential alternative would not be feasible if the cost would render the Project unviable or uncompetitive, or if a particular design was considered technically unsound or unsuitable for deployment or would not meet industry safety and regulatory requirements.
151. As for legal feasibility, a relevant practical example can be found in the recent UK OWF derogation decisions. By way of example (and in common with the SofS’s earlier decisions), in the HRA for East Anglia ONE North Limited, the SofS concluded as follows:
- “The site selection for all offshore wind proposals in the UK is controlled by The Crown Estate leasing process. Sites not within the areas identified by The Crown Estate leasing process or outside of that which the Applicant has secured (the southern East Anglia Zone) are not legally available, and therefore do not represent alternative locations.”*
152. This suggests that feasible alternative locations can only be within areas/ sites currently identified for leasing either by Crown Estate Scotland (CES) or TCE.

⁵¹ See for example paragraph 17.25 of the SofS’s decision letter for East Anglia ONE North Limited, dated 31 March 2022.

⁵² See Attorney General’s opinion C-209/04 (Lauteracher Ried) where it is noted that the examination of alternatives does not require “every theoretically imaginable alternative” to be considered.

ASSESSMENT OF ANY IDENTIFIED ALTERNATIVE SOLUTIONS – STEP 4

153. Finally, MN 2000 guidance advises that where feasible alternative solutions that meet the core project objectives are identified, those alternatives should each be analysed and compared with regard to their relative impact (if any) on any European site(s).
154. An assessment of feasible alternative solutions should comprise an assessment of the adverse effects on the specific European site in question, but also any adverse effects on other European sites and qualifying features must be considered.
155. At this stage it is not necessarily the case that any feasible alternative that reduces effects on the European site in question results in failure of the alternatives test. Some ECJ case law and EC opinions indicate that the impact of a feasible alternative solution should be materially lower in order for a potential alternative to be considered a genuine alternative⁵³.

4.3. CONTENT AND STRUCTURE

156. Drawing on the guidance and planning precedent identified above, a staged process has been adopted, to provide a structured and sequential method for examination of alternative solutions:

- | | |
|--------|---|
| Step 1 | Identify the core project objectives for The Project, in the context of the identified need |
| Step 2 | Consider 'do nothing' scenario |
| Step 3 | Identification of any feasible alternative solutions that meet core project objectives |
| Step 4 | Comparative assessment of any feasible alternative solutions on European site(s) |

⁵³ In Case C-239/04 (paragraph 44), the ECJ stated: “the choice does not inevitably have to be determined by which alternative least adversely affects the site concerned. Instead, the choice requires a balance to be struck between the adverse effect on the integrity of the SPA and the relevant reasons of overriding public interest”. In similar vein, EC Opinion C(2018) 466, 2018 notes “None of the alternatives would give rise to a significantly lower impact”.

Table 7 Core project objectives adopted by SofS in previous OWF HRA derogation cases and Round 4 plan level objectives

Theme	Hornsea Three	Norfolk Boreas	Norfolk Vanguard	EA ONE North	EA TWO	TCE Round 4
Low carbon electricity generation from offshore wind farm for UK supply	To generate low carbon electricity from an offshore wind farm in support of the decarbonisation of the UK electricity supply	To generate low carbon electricity from an offshore wind farm in support of the decarbonisation of the UK electricity supply	To generate low carbon electricity from an offshore wind farm in support of the decarbonisation of the UK electricity supply;	To generate low carbon electricity from an offshore wind farm in support of the decarbonisation of the UK electricity supply.	To generate low carbon electricity from an offshore wind farm in support of the decarbonisation of the UK electricity supply.	To deliver greater volumes of low carbon electricity, as established by National Policy Statements EN-1 and EN-3, the UK government's Ten Point Plan for a Green Industrial Revolution¹, the Offshore Wind Sector Deal², the 2020 Energy White Paper³, the Climate Change Act 2008 (as amended). To maximise social and economic opportunities for the UK from energy infrastructure investment and (respond to the Clean Growth Strategy (DBEIS 2017) and the UK "Offshore Wind Sector Deal" (DBEIS 2019).
Commitment to offshore wind and security of supply	To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply	To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply	To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply;	To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply.	To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply.	To support the decarbonisation and security of UK electricity supply. To support the UK's long-term plans for energy security and to increase domestic energy generation.
Optimisation, utilising available sites and grid capacity	To optimise generation and export capacity within the constraints of available sites and onshore transmission infrastructure.	To optimise generation and export capacity within the constraints of available sites and onshore transmission infrastructure.	To optimise generation and export capacity within the constraints of available sites and onshore transmission infrastructure; and	-	-	To deliver at least 7 GW of new seabed rights in England and Wales.
Carbon reduction commitments	To deliver a significant volume of offshore wind in the 2020s.	Contribute to the UK's drive to meet carbon reduction commitments	Contribute to the UK's drive to meeting carbon reduction commitments.	-	-	To facilitate the delivery of new offshore wind generation capacity in a timely manner to help meet UK government targets to cut greenhouse gas emissions to net zero by 2050.

5. NO ALTERNATIVE SOLUTIONS CASE: STEP 1 – THE CORE OBJECTIVES

5.1. THE CORE OBJECTIVES OF THE PROJECT

157. The need for The Project is demonstrated comprehensively in the Statement of Need and has been summarised in Section 3 of this Report. In short, offshore wind must be deployed urgently, starting as soon as possible, and at scale.
158. Against this backdrop, the genuine and critical project objectives for The Project are set out in Table 8 below. These six core project objectives respond to the environmental (decarbonisation), regulatory, market and economic factors summarised above.

Table 8 Core project objectives for The Project

No.	The Project Objective	Basis for the Objective
1	Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets	- Urgent action is needed to deliver decarbonisation and limit global warming to less than 1.5 degrees - Scottish First Minister declared a climate emergency in April 2019 and Scotland has legally binding targets to reduce greenhouse gas emissions by 75% by 2030 and to “Net Zero” by 2045 - UK Parliament declared a climate emergency in May 2019 and the UK has legally binding targets to reduce greenhouse gas emissions by 78% by 2035 and to “Net Zero” by 2050 - Delivery at scale is needed to make this change in the time available - Fixed Foundation Offshore wind is a proven technology which can deliver substantial low carbon electricity generation in the short to medium term (and beyond) and which cannot be replicated by other technologies or in other settings (e.g. onshore wind)
2	Maximise generation and export capacity within the constraints of available UK sites.	- There is limited seabed available in Scotland and in the UK via the seabed leasing processes for OWFs to be located - Round 3 sites were identified through Strategic Environmental Assessment and plan level HRA and are amongst the least constrained for rapid deployment of offshore wind deployment - Generation capacity should be maximised within the available seabed to maximise benefits for Scottish and UK decarbonisation targets - Maximising capacity supports the diversity of generation portfolio within the UK and contributes towards security of supply - Regions with high-capacity factors and windspeeds should be prioritised and developed efficiently - Economies of scale of large projects result in a more efficient delivery methodology but also in decreased costs, and a more viable delivery methodology, as described in Objective 4 below - Grid connection has been secured for 4.1 GW
3	Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters	- Seabed capacity for fixed foundation OWFs is extremely limited in Scottish waters - Fixed foundations are a proven and reliable technology with a strong supply chain - Fixed foundations can be delivered at commercial scale and at lower cost than other technologies including floating wind

No.	The Project Objective	Basis for the Objective
4	Deliver low carbon electricity at the lowest possible cost to the UK consumer	- The Project will make efficient and essential use of this crucial resource to deliver low-cost low carbon electricity generation ~25% of Scottish customers are classified as living in fuel poverty, of which ~12.4% are living in extreme fuel poverty⁵⁴ - New low carbon energy generation capacity at the lowest possible cost is needed to deliver a just and fair energy transition - Lowest possible levelised cost of energy (LCoE) is required to enable the Project to be competitive in CFD auctions and therefore be viable - Efficient use of limited grid resource will further reduce costs to the consumer - The Project will make efficient use of available lowest cost grid capacity and has a secured grid connection into locations with existing capacity, reducing the requirement for the development of new grid infrastructure
5	Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the UK national grid before 2030	- A substantial volume of capacity is required in time to contribute to 2030 legally binding targets for both Scotland and the UK - Scottish Government has an ambition to increase offshore wind capacity to 11GW of energy installed by 2030. - UK Government has pledged to deliver 50GW of offshore wind capacity by 2030 - The delivery of low carbon electricity generation capacity is required as soon as possible to meet targets and importantly to limit the magnitude and impacts of climate change - Grid connection has been secured for 4.1 GW - Fixed foundation OWFs are a mature technology and there is high degree of certainty on deliverability at scale before 2030
6	Helping ensure UK energy supply security from the mid-2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets.	- Significantly increased consumer bills due to the UK being particularly exposed to high gas prices, because 85% of households use gas boilers to heat their homes and around 40% of electricity is generated in gas-fired power stations ('CarbonBrief', August 2022). - The production of low carbon domestic energy is urgently required to meet 2030 decarbonisation targets and importantly to reduce reliance on foreign energy sources and address the current UK cost of energy crisis

⁵⁴ [Scottish House Condition Survey: 2019 Key Findings \(www.gov.scot\)](https://www.gov.scot/publications/scottish-house-condition-survey-2019-key-findings/pages/10.aspx). The latest available figures are from 2019 and were published by the Scottish Government in December 2020. Fuel poverty is defined by the Scottish Government as any household spending more than 10% of their income on energy - after housing costs have been deducted.

6. NO ALTERNATIVE SOLUTIONS CASE: STEP 2 – DO NOTHING

160. The “do nothing” scenario would comprise not proceeding with The Project and the loss of 4.1GW of offshore wind capacity.
161. A “do nothing” scenario would not meet any of The Project core project objectives and can be discounted on that basis.
162. If The Project does not proceed, a significant area of seabed identified by TCE as suitable and made available for large-scale offshore wind development in Scottish waters would not be developed in the near-term (if at all).
163. The Project is the only offshore wind opportunity in Scotland currently listed on the TEC Register as deliverable in the period 2025-2030⁵⁵. Without The Project, Scotland would not increase its installed offshore wind capacity between 2024 (when Moray West is due to commission) and when the ScotWind sites start to commission – see Figure 4⁵⁶.
164. In the “do nothing” scenario there would be a gap between Scottish AR3 OWFs (coming online in the next three years) and future ScotWind developments (likely to mostly come online in the 2030s).
165. In the absence of The Project, Scotland cannot be expected to even meet its lower target of 8GW of offshore wind capacity set in the Offshore Wind Policy Statement. Scottish supply chain opportunities would also be missed.

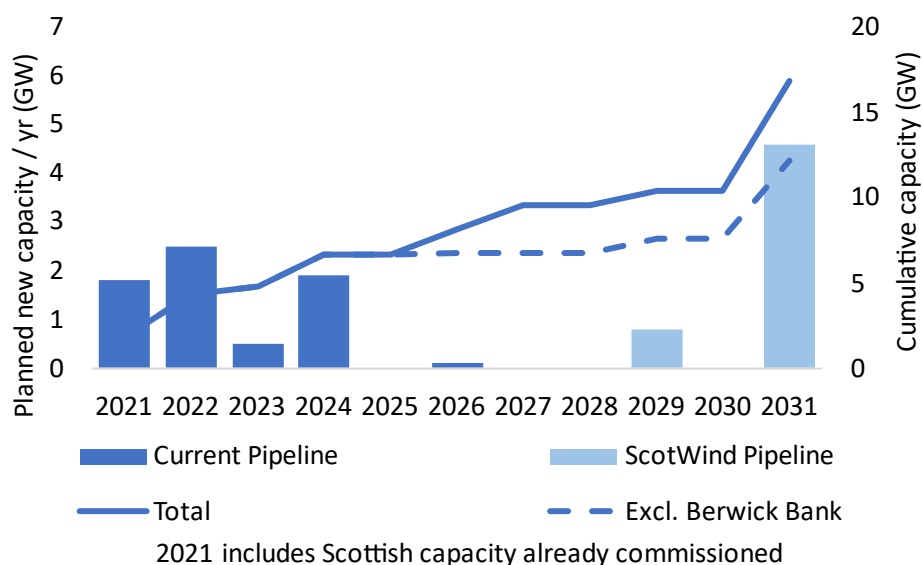


Figure 4 Current operational and planned future capacities of offshore wind connecting in Scotland, 2021-2030, excluding unsuccessful projects and excluding The Project capacity⁵⁷

166. Thus, doing nothing (no Berwick Bank) would substantially hinder decarbonisation and security of supply efforts during the critical 2020s and is to ignore the clear need for rapid

⁵⁵ Except for the final 0.1GW of Moray West and a potential 0.8GW of capacity from ScotWind N1 winner Offshore Wind Power Ltd.

⁵⁶ Offshore wind farms in Scotland against their years of connection based on Transmission Entry Capacity Register, National Grid ESO, March 2022.

⁵⁷ Transmission Entry Capacity Register, National Grid ESO.

OWF deployment at scale. The importance of the decarbonisation, energy security and related affordability challenges mean that no viable OWF projects should be passed over in the development process. It is not compatible with a climate emergency to “do nothing”.

167. For all these reasons, the “do nothing” option is discounted.

Table 9 Performance of “Do Nothing” scenario against the Project objectives

Alternative Solution	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	<i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	<i>Maximise generation and export capacity within the constraints of available UK sites</i>	<i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	<i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	<i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the UK national grid before 2030</i>	<i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
Do Nothing	Hinders progress toward Scotland and UK decarbonisation targets	Ignores an opportunity for large-scale capacity within an available site	Does not make use of shallow seabed in Scotland	Likely to increase consumer cost in long term	Significant contribution to the UK national grid by 2030 is lost	Hinders / delays progress toward achieving energy security from domestic sources in near term

7. NO ALTERNATIVE SOLUTIONS CASE: STEP 3 – IDENTIFY ANY FEASIBLE ALTERNATIVES

7.1. SCOPE OF ALTERNATIVES CONSIDERED

168. The approach to the identification of feasible alternative solutions in this section is informed by the guidance and previous OWF derogation cases discussed above (Section 4) and the core project objectives for The Project (Section 5).
169. The “do nothing” option has been considered and discounted at Step 2 above.
170. Consistent with Defra guidance (2012 and 2021a) and the five UK OWF HRA derogation decisions to date, the consideration of feasible alternative solutions is limited to alternative wind farm projects / locations / designs. Alternative (non OWF) forms of energy generation would not meet any of The Project core project objectives and would not support fundamental Scottish and UK Government policy aims as articulated in the Offshore Wind Policy Statement and the BESS, amongst others.
171. Therefore, the scope for consideration of potentially feasible alternative solutions is as follows:
- Alternative OFW array locations:
 - Alternative array locations not in the UK Renewable Energy Zone (REZ);
 - Alternative array locations within the UK REZ, excluding the former Firth of Forth Zone;
 - Alternative array locations within the former Firth of Forth Zone.
 - Alternative design and modes of operation:
 - Alternative scale: developable array area, within constraints of the Firth of Forth Zone;
 - Alternative design: turbines and layout and minimum lower tip height.
172. Each of the above is considered in turn below, in the context of The Project core project objectives, and with regards to their feasibility (financial, legal and technical).

7.2. ALTERNATIVE ARRAY LOCATIONS NOT IN THE UK REZ

173. Scotland and the UK have legal obligations in relation to carbon emission reductions to achieve Net Zero, and corresponding policy aims in respect of the deployment of renewable energy generation and energy security. Conversely, other international and EU countries similarly have their own emission reduction and renewable energy targets and security of energy supply aims.
174. Sites outside the UK REZ have not been claimed by the UK under the Energy Act 2004 for exploitation for energy production, are not subject to TCE/CES offshore wind leasing rounds and are not available to the Applicant. Moreover, such sites are required for other EU member states and countries to achieve their own respective targets pursuant to the Paris Agreement in respect of climate change and renewable energy, and to ensure their own security of energy supply. Therefore, it is considered unlikely any such site would be made available for an OWF to connect to the GB network.
175. For the above reasons alternative sites for OWFs outside UK REZ would provide no contribution to:
- Scottish and UK interim emission reduction targets (2030) or the 2045/50 Net Zero targets
 - Scotland’s target of 8 – 11GW of offshore wind capacity by 2030

- The UK target for 50GW of offshore wind capacity by 2030
 - Energy security of supply in Scotland and the UK
176. This alternative would also fail to meet any of The Project core project objectives as set out in Table 10 below.
177. It is therefore concluded that locations outside the UK REZ cannot reasonably be considered a feasible alternative solution to The Project.
178. It is noted that a similar conclusion was reached by the SofS in each of the five previous UK OWF HRA derogation cases. For example, the SofS's HRA for East Anglia ONE North states⁵⁸:

“Although the UK is party to international treaties and conventions in relation to climate change and renewable energy, according to the principle of subsidiarity and its legally binding commitments under those treaties and conventions, the UK has its own specific legal obligations and targets in relation to carbon emission reductions and renewable energy generation. Other international and EU countries similarly have their own (different) binding targets. Sites outside the UK are required for other countries to achieve their own respective targets in respect of climate change and renewable energy.”

Table 10 Performance of alternative array locations not in the UK REZ against the Project objectives

Alternative Solution	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	<i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	<i>Maximise generation and export capacity within the constraints of available UK sites</i>	<i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	<i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	<i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the UK national grid before 2030</i>	<i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
Alternative array locations not in UK REZ	Provides no contribution towards Scottish and UK decarbonisation targets	Location outside UK REZ not available. Fails to utilise an available UK site	Does not make use of available seabed in Scotland	Very unlikely to be at lowest possible consumer cost	No contribution to the UK national grid	Would not support the aim of achieving energy security from domestic sources – capacity would be dependent on foreign state allowing OWF to operate and export to UK

⁵⁸ See section 9.1.3.2, on p84.

7.3. ALTERNATIVE ARRAY LOCATIONS OUTSIDE THE FORMER FIRTH OF FORTH ZONE

OVERVIEW

179. This section considers the potential for alternative array sites in Scottish waters and the wider UK REZ, excluding the former Firth of Forth Zone (in which The Proposed Development is located).
180. The potential for alternative array locations within the former Firth of Forth Zone is considered separately in Section 7.4 of this Report.

LEGAL FEASIBILITY – AVAILABLE SITES

181. TCE and CES own or exercise exclusive rights to manage the leasing of and exploitation of the seabed for offshore wind development within UK territorial waters and, through the Energy Act 2004, the wider UK REZ. TCE / CES make areas of seabed available for offshore wind development selectively in successive offshore leasing rounds, usually several years apart.
182. As noted earlier, in recent OWF HRA derogation decisions the SofS has concluded that sites outside of areas secured by the respective applicant do not represent alternative locations. For example, again taking the HRA for East Anglia ONE North as an example⁵⁹:
“The site selection for all offshore wind proposals in the UK is controlled by The Crown Estate leasing process. Sites not within the areas identified by The Crown Estate leasing process or outside of that which the Applicant has secured (the southern East Anglia Zone) are not legally available, and therefore do not represent alternative locations.”
183. Outside of ScotWind (addressed further below), other areas of seabed are not available to the Applicant and are not feasible alternative solutions on that basis. However, there are many additional reasons to discount other locations / leasing rounds as alternatives, as set out in the following sections.

FUTURE OFFSHORE WIND LEASING ROUNDS

184. CES has recently concluded the ScotWind leasing round and is focused on the Innovation and Targeted Oil and Gas Decarbonisation (INTOG) leasing round (both discussed further below). TCE is currently planning the Celtic Sea leasing round (also discussed below).
185. Outside of Celtic Sea and INTOG, any future alternative array location to replace The Proposed Development would depend on a fresh site leasing process being initiated by TCE and CES. There is no sign of that in the short term.
186. When and where (or indeed if) any further areas of the seabed may be offered by either CES or TCE is unknown and a matter of speculation. At this stage, the availability of alternative locations outside of current TCE / CES leasing rounds is theoretical⁶⁰ (as well as legal unavailable – see above) and can be discounted on that basis. **Therefore, any parts of the UK REZ not currently the subject of an OWF leasing round do not constitute feasible alternative solutions.**
187. Future locations released via future OWF leasing rounds can additionally be discounted on timing grounds. Figure 5 below is indicative and reflective of historic and not necessarily future OWF development timescales. However, areas of seabed developed to date were

⁵⁹ See section 9.1.3.3 at p84.

⁶⁰ Hypothetical options can be discounted per Attorney General's opinion C-209/04 (Lauteracher Ried).

identified as areas of least constraint / greatest opportunity for OWF, and there is no reason to automatically assume any future sites would be less challenging or can be more rapidly developed than previously, or that it will be possible to do so while avoiding any adverse effects on European sites.



Figure 5 Indicative historic time frames for delivering OWF Projects (Source TCE).

188. Even if the highly optimistic assumption is made that historic timescales could be condensed by as much as 50%⁶¹, a fresh OWF leasing round starting in 2023 would not deliver substantial additional installed OWF capacity before 2030. Moreover, as discussed further below and in the Applicant's Statement of Need, grid connection dates for OWF projects in development now (e.g. ScotWind) are typically from 2033 onwards.
189. The huge scale of Scotland and UK targets for offshore wind, the short timescales now to meet 2030 targets (7 years) and prevalence of offshore environmental and technical constraints, mean that lost capacity (at the scale of 4.1GW) cannot be expected to be offset by other future uninitiated leasing rounds, even on the most optimistic of outlooks.
190. For the reasons set out above, it is concluded that alternative locations outside areas/ sites currently identified for leasing either by CES or TCE are not alternative solutions. **ACTIVE CROWN ESTATE OWF LEASING ROUNDS - OVERVIEW**
191. CES and TCE leasing rounds completed or underway are summarised in Table 11 and further detailed in the subsequent sections, where relevant. The Proposed Development is located within the former Firth of Forth Zone, a region identified and made available by TCE during Round 3.

Table 11 Offshore wind leasing rounds in Scotland and the UK

Leasing Round	Area	Year awarded	Sites awarded	Capacity awarded	Source	Capacity currently in operation in 2022
TCE R1	Inshore (<12nm) England and Wales	2000	27	1.2GW	Catapult Offshore Renewable Energy (Undated)	0.93GW (78% of awarded, i.e., 22% attrition)

⁶¹ It can be noted in this context that Round 4 and ScotWind leasing stages were both subject to delays and took longer than expected.

Leasing Round	Area	Year awarded	Sites awarded	Capacity awarded	Source	Capacity currently in operation in 2022
TCE R2	Generally offshore (>12nm) England and Wales	2003	15	7.2GW	Catapult Offshore Renewable Energy (Undated)	6.27GW (87% of awarded, i.e., 13% attrition)
Scottish Territorial Waters	Inshore and offshore Scotland	2009	10	7.2GW	4c Offshore (undated)	0.58GW (8.19% of awarded, i.e., 91.81% attrition)
TCE Extensions Round (from R1 and R2)	Inshore and offshore England and Wales	2010	7	3.66GW	4c Offshore (undated)	2.5GW (53.47% of awarded, i.e. 46.53% attrition)
TCE R3	Inshore/offshore England and Wales and offshore Scotland	2010	6	30GW	4c Offshore (undated)	2.49GW (8.3% of awarded, i.e. 91.7% attrition) ⁶²
TCE Extensions Round 2017	Inshore and offshore England and Wales	2017	7	2.85GW	TCE	0%
TCE R4	Offshore England and Wales	2021	6	7GW	TCE	0%
ScotWind	Offshore Scotland	2022	17	24.8GW	CES	0%
INTOG	Offshore Scotland	2023	TBC	6.2GW	CES	0%
Celtic Sea	Offshore England and Wales	2023	TBC	4GW⁶³	TCE	0%
TOTAL				93.3.1GW		~12.7GW

192. Operational/ existing OWF projects from Rounds 1, 2 and 3, the TCE Extensions Round (2010) and the STW round have already been fully or largely developed and form part of existing baseline of OWF installed capacity and do not provide additional installed capacity

⁶² It is acknowledged that there is 7.6GW of Round 3 projects in construction (Dogger Bank (3.6GW), Hornsea 2 (1.4GW), Sofia (1.4GW) and Seagreen Phase 1 (1.1GW) and a further ~15GW consented but not yet in construction. Nevertheless, it is notable that it has taken over 10 years to consent and build only ~2.5GW from the target capacity of 30GW.

⁶³ TCE's latest public announcement in October 2022 indicates Celtic Sea round is intended to provide 4GW by 2035. Although the wider region is assessed to have the potential to for up to an additional 20GW by 2045, that is not part of the current Celtic Sea opportunity.

(as an alternative to The Project) that is required to achieve current Scottish and UK OWF capacity targets of 11GW and 50GW respectively. Accordingly, they can be discounted as alternatives to The Project.

193. Figure 6 and Figure 7 below taken from the Applicant's Statement of Need illustrate current Scottish (Figure 6) and UK (Figure 7) operational and consented capacity, and the predicted trajectory up to 2030 based on the TEC Register. The red dotted line indicates the Scottish Government's lower target of 8GW of offshore wind capacity and the red dashed line indicates the upper 11GW target.

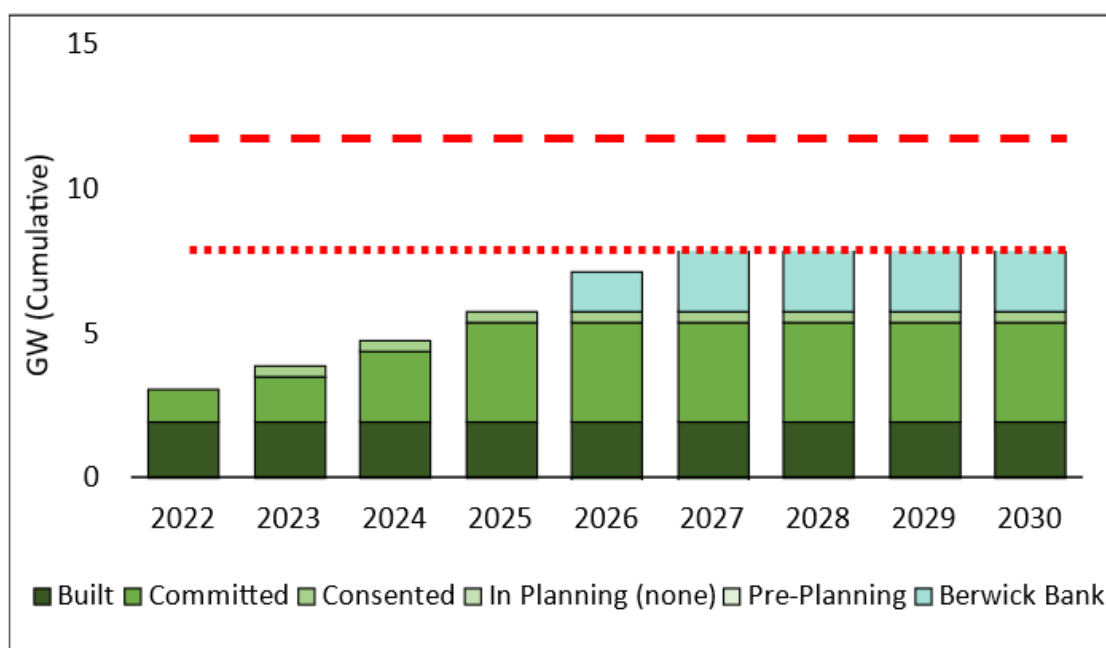


Figure 6 Current capacity (GW) and connection date of Scottish OWF projects inc. The Proposed Development (blue)

194. TCE Project Listings lists 1.9GW of built offshore wind in Scotland, with a further 3.9GW of consented and/or committed projects which are currently scheduled to deliver before 2025. These projects include Neart na Gaoithe (0.4GW), Seagreen Phase 1 (1.1GW), Inch Cape (1.1GW), Moray West (0.9GW) and Seagreen Phase 1A (0.4GW).
195. No other offshore wind farms are yet consented in Scottish waters, and none are currently listed as in the planning process in TCE's project listings. The Project is the only Scottish OWF with seabed rights, in planning and with a grid connection agreement connecting substantial capacity before 2030 (2.3GW).
196. There is 3.7GW of ScotWind sites listed with grid connection agreements however none of them are effective before 2033. While some ScotWind projects aim to be advanced in the late 2020s, challenges clearly remain in securing National Grid connection agreements which could result in delays to some projects. Due to the uncertainty around National Grid connection options and potential supply chain issues it is likely that projects leased through the Scotwind project could have varied timelines for project development. As a result, it is hard to predict how many projects will contribute to 2030 targets with a number of projects likely to come online in the following decade.
197. To meet Scotland's Offshore Wind installed capacity target, between 8 and 11GW of offshore wind must be commissioned before 2030. As shown on Figure 7 above, in the absence of The Project, Scotland will not meet its lower target of 8GW of offshore wind capacity (red dotted line), and the 11GW target (red dashed line) is unachievable unless other project timelines are brought forwards ahead of their current grid connection dates.

198. Only by consenting the Project can Scotland be sure to meet the 8GW lower target threshold by 2030 and maintain the necessary trajectory towards the 11GW target.
199. The picture in terms of the need for The Project to achieve OWF installed capacity targets (50GW by 2030) is the same at UK level. TCE Project Listings includes 12.3GW of built offshore wind in the UK, with a further 8GW under construction. These include Dogger Bank (3.6GW), Hornsea 2 (1.4GW), Sofia (1.4GW) and Neart na Gaoithe and Seagreen Phase 1 (0.4GW and 1.1GW respectively) in Scotland. Hornsea 2 is currently commissioning therefore partially operational.
200. An additional 12.4GW of capacity has been consented but is not yet under construction. These projects are currently scheduled to deliver before the end of 2030, and include the Scottish projects listed above. Other projects include Hornsea Project Three (3GW), East Anglia Three (1.5GW), Norfolk Boreas (1.8GW), Norfolk Vanguard (1.8GW), East Anglia One North and East Anglia Two (each 1GW)
201. UK installed and operational capacity from already consented projects has the potential to be 32.7GW by the end of 2030, subject to all currently indicated capacity being fully delivered at the current grid connection date. TCE's Project Listing also includes 3.4GW of projects currently in planning (including Awel y Môr and Hornsea 4).
202. The total pipeline of projects with seabed leases which have not yet formally entered planning, consists of 33 projects with 44.1GW of potential capacity. Grid connection dates for these projects, apart from The Project, are largely scheduled for the 2030s. The projects cover a range of technologies, including extensions to existing (operational) seafloor mounted offshore wind farms, for example Rampion and Dudgeon⁶⁴.
203. Figure 7 below accordingly shows that The Project also has a critical role to play in achieving the UK's 2030 target capacity of 50GW (solid red line).
204. Figure 7 taken from the Applicant's Statement of Need shows the cumulative operational capacity of offshore wind in the UK assuming all projects currently listed are delivered consistent with their current connection dates and capacities.
205. **It illustrates that, to achieve the BESS target of 50GW by 2030, requires all projects currently in planning, including The Project, to be delivered according to their current connection dates and requires some other pipeline projects (e.g. ScotWind) to be accelerated and brought forwards into the 2020s.**
206. However, as set out in the Applicant's Statement of Need, analysis of original estimated installed capacity at the point of lease grant, compared to TCE data on delivered capacity, shows that historically, the attrition rate for UK OWF projects has been around 30%⁶⁵. For some OWF leasing rounds the attrition rate has been even higher (e.g. Scottish Territorial Waters round). The inclusion of a project on a future project pipeline does not indicate that the project will go ahead, or if it does, at a particular generation capacity; attrition occurs for various reasons, including the consenting process, financial reasons, construction reasons or supply chain issues. A 100% success rate for future new projects is neither a reasonable nor a safe assumption.

⁶⁴ In this context it can be noted that the extension at Race Bank was dropped from TCE Extensions round, a demonstration of why registers generally could be overly optimistic as forecasts of future capacity.

⁶⁵ This analysis covers projects which have either delivered, or been abandoned, across a total estimate of 22GW of potential capacity across Allocation Rounds 1, 2, 3, Scottish Territorial Waters and Round 1&2 Extension round of which has been delivered.

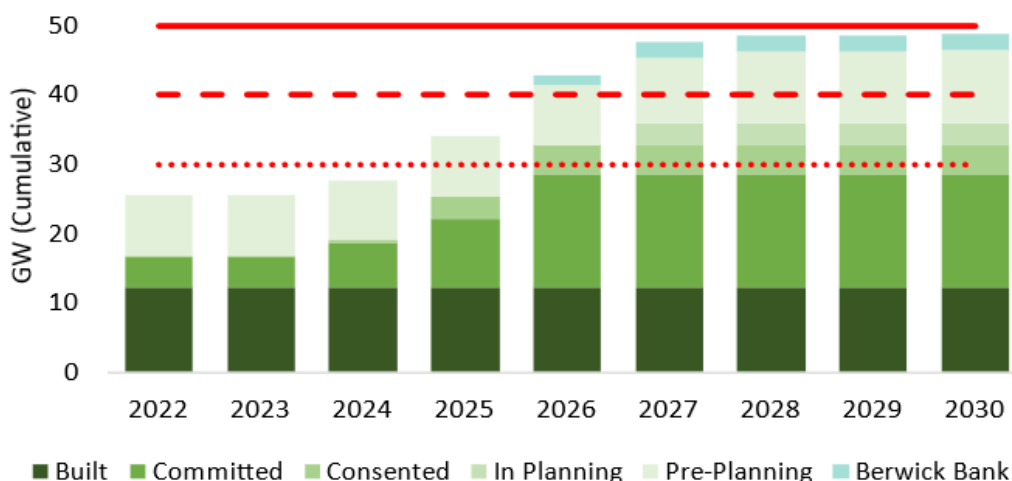


Figure 7 Current capacity (GW) and connection date of UK OWF projects including The Proposed Development (blue)

207. **Without The Project the 2030 targets at Scottish and UK level will therefore not be met.** Any suggestion that other OWF projects could make up for the loss of a single 4.1GW project fundamentally misunderstands the scale of the task to make substantial progress by 2030. Other OWF projects either provide part of the existing baseline of installed capacity or are part of a future pipeline of projects all of which is required.
208. **Accordingly, it is concluded that other projects are needed in addition to, not instead of, The Project. Other OWF projects are not alternative solutions to The Project.**
209. For completeness, further commentary on and justification for discounting other current OWF leasing rounds is provided in the following sections.

TCE EXTENSION ROUND 2017

210. Seven extension sites in English and Welsh waters were awarded in 2017 with a total combined of capacity of 2.85GW. The following observations are made:
- It would be necessary for all seven extension projects to be delivered to their maximum anticipated capacity to offset just ~60% of the capacity lost if The Project did not proceed.
 - The purpose of the extension projects is to provide *additional* capacity towards the UK's 50GW target, not make up a "capacity gap" created by a failure to deliver remaining Round 3 projects.
 - TCE Extensions Round (2017) projects will not contribute to Scotland's domestic decarbonisation targets (and would only partially achieve The Project core project objective 1).
 - TCE Extension Round (2017) projects would not achieve The Project core project objective 3 (efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters).
 - It has been concluded in previous Sections of this Report that "do nothing" (i.e. no The Project) is not an alternative solution and that Scottish and UK OWF capacity targets for 2030 will not be met without The Project's contribution. The existence of the TCE Extensions Round (2017) does not alter that conclusion.
211. **For all these reasons, reliance on TCE Extensions Round (2017) projects (alone or in aggregate) is not an alternative solution to The Project.**

ROUND 4 SITES

212. Six Round 4 projects in English and Welsh waters were selected in February 2021 with a total estimated combined capacity of 7,980MW. Five of the six projects have proposed total capacities of 1,500MW, with the remainder proposing a total capacity of 480MW⁶⁶. In August 2022, following completion of the plan-level HRA process TCE indicated it would be moving forwards to conclude Agreements for Lease.
213. The following observations are made:
- The Applicant does not hold any development rights in any Round 4 sites. None of the Round 4 sites are available to the Applicant.
 - Even assuming improvement on historic OWF development timescales (see [Figure 6](#) above), these projects are unlikely to be generating power before 2030.
 - With one exception, the projected dates for connection of Round 4 projects on the National Grid's Transmission Entry Capacity (TEC) Register are all post 2030. The one project with grid connection agreement before 2030 (Eastern Regions, 1.5 GW) would not offset the lost capacity if The Project did not proceed.
 - The maximum individual project size is set at 1.5GW and no individual project progressed via Round 4 would make the same contribution as The Project.
 - The purpose of the Round 4 projects is to provide *additional* capacity towards the UK's 50GW target, not make up a "capacity gap" created by a failure to deliver remaining Round 3 projects such as The Project.
 - Round 4 projects will not contribute to Scotland's domestic decarbonisation targets (and would only partially achieve The Project core project objective 1).
 - Round 4 projects do not achieve The Project core project objective 3 (efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters).
 - It has been concluded above that "do nothing" (i.e. no The Project) is not an alternative solution and that Scottish and UK OWF capacity targets for 2030 will not be met without The Project's contribution. The existence of the Round 4 does not alter that conclusion.
214. **For all these reasons, it is concluded that reliance on Round 4 projects (alone or in aggregate) is not an alternative solution to The Project.**

CELTIC SEA FLOATING OFFSHORE WIND FARM ROUND

215. TCE is currently planning a leasing round for floating wind projects in the Celtic Sea. The Celtic Sea round is intended to provide up to 4GW of floating wind energy capacity by 2035⁶⁷. Eligible projects must be between 300MW (minimum) and 1GW (maximum) and must be located within one of five (refined) areas of search identified by TCE.
216. The latest update from TCE (October 2022) indicates that an Information Memorandum will be published in spring 2023 ahead of formal launch of the three-stage tender process in mid-2023, with a view to awarding Agreements for Lease by the end of 2023.
217. The following observations are made:
- The timescales for the leasing round may slip backwards, and/or areas of search may change (e.g. the plan-level HRA process for Celtic Sea is ongoing in parallel and could lead to changes or delays) which may alter the scale and nature of the opportunity.
 - TCE's stated aspiration is for build out of the successful projects to occur in the period 2030 – 2035. Therefore, it does not appear to be intended (and is unlikely in any event) that the Celtic Sea round will provide any substantial contribution to the 2030 targets.

⁶⁶ [Offshore Wind Leasing Round 4 - Tender process outcome \(thecrownestate.co.uk\)](#).

⁶⁷ TCE update, October 2022. [2022 - The Crown Estate updates developers on latest steps in the leasing process for floating wind in the Celtic Sea](#) | [2022 - The Crown Estate updates developers on latest steps in the leasing process for floating wind in the Celtic Sea](#)

- Even assuming improvement on historic OWF development timescales (see **Figure 6** above, which largely relate to fixed bottom OWF, not floating), these projects are unlikely to be generating power before 2030.
- Connecting these projects to the grid will depend on the outcome of phase 2 of the Holistic Network Design (HND) process, with connection dates highly likely from 2030 onwards.
- Given the above, Celtic Sea round projects will not achieve The Project core project objective 5 (deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the UK national grid before 2030) nor core project objective 6 (helping ensure the UK energy supply security from the mid-2020s).
- The maximum individual project size is set at 1GW and no individual project progressed via the Celtic Sea round would make the same contribution as The Project.
- It would be necessary for the full 4GW target to be delivered to offset the majority of the capacity lost if The Project did not proceed.
- The purpose of the projects is to provide *additional floating* capacity towards the UK's 50GW target, not make up a "capacity gap" created by the loss of remaining Round 3 projects such as The Project or Round 4 projects
- Given their location (outside Scottish waters) and the aim to accelerate commercial scale floating offshore wind, Celtic Sea projects would not achieve The Project core project objective 3 (efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters).
- Fixed bottom offshore wind deployed this decade (such as The Project) is likely to be significantly cheaper over its lifetime than floating offshore wind deployed over the coming twenty years (see comparative analysis in section 8.4 of the Applicant's Statement of Need). Celtic Sea projects would not achieve The Project core project objective 4 (deliver low carbon electricity at the lowest possible cost to the consumer).
- Celtic Sea projects will not contribute to Scotland's domestic decarbonisation targets (and would only partially achieve The Project core project objective 1).
- It has been concluded above that "do nothing" (i.e. no The Project) is not an alternative solution and that Scottish and UK OWF capacity targets will not be met without The Project's contribution. The existence of the Celtic Sea round does not alter that conclusion.

218. **For all these reasons, reliance on Celtic Sea Round projects (alone or in aggregate) is not an alternative solution to The Project.**

INTOG

219. The INTOG lease round has recently been set up to allow future OWFs to provide low carbon electricity to power oil and gas installations as well as alternative outputs such as hydrogen. Two types/scales of project are envisaged by CES⁶⁸:

- "IN" – small scale projects of less than 100 MW; and
- "TOG" - Projects connected directly to oil and gas infrastructure, to provide electricity and reduce the carbon emissions associated with production.

220. CES has set a maximum aggregate capacity limit that can be awarded exclusivity of 5.7GW for TOG projects and 500MW for Innovation projects⁶⁹. Therefore, the overall capacity of the INTOG leasing round is currently expected to be 6.2GW.

221. The application window for INTOG closed on 18 November 2022. CES has estimated that the evaluation of submitted applications will take around 3 months, with exclusivity agreements entered with successful bidders in late February/early March 2023.

222. The following observations are made:

⁶⁸ [INTOG - Our projects - Crown Estate Scotland](#)

⁶⁹ CES INTOG Offer Leasing Document, August 2022. [intog-offer-document \(crownestatescotland.com\)](#)

- It is understood that the Sectoral Marine Plan for Offshore Wind is under review and is to be updated to identify Plan Option areas for INTOG projects. Therefore, at this stage, there remains a risk of delay and spatial planning uncertainty/ risk.
- CES has indicated Option Agreements will only be signed with successful bidders after the Sectoral Marine Plan update is complete, which is not expected until winter 2023/2024. Therefore, significant development work on these projects may not commence until 2024 or later.
- Even assuming improvement on historic OWF development timescales (see **Figure 6** above, which largely relate to fixed bottom OWF, not floating), these projects are unlikely to be generating power at scale before 2030.
- It is expected that TOG projects will connect to an off-grid solution (i.e., an oil and gas installation), to facilitate the North Sea energy transition. Thus, these projects would not be exporting power to the UK national grid.
- In view of all the above, INTOG Round projects will not achieve The Project core project objective 5 (deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the UK national grid before 2030) nor core project objective 6 (helping ensure the UK energy supply security from the mid-2020s).
- It would be necessary for around 65% of the INTOG Round projects to be delivered to the maximum capacity to offset the capacity lost if The Project did not proceed. As mentioned above, historic data shows an average attrition rate of approximately 30% of OWF rounds.
- Due to the greater distance from shore and bathymetry / deeper water depths, floating offshore wind turbines are likely to be the primary technology. As such INTOG projects would not achieve The Project core project objective 3 (efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters).
- Fixed bottom offshore wind deployed this decade (such as The Project) is likely to be significantly cheaper over its lifetime than floating offshore wind deployed over the coming twenty years (see comparative analysis in section 8.4 of the Applicant's Statement of Need). INTOG projects would not achieve The Project core project objective 4 (deliver low carbon electricity at the lowest possible cost to the consumer).
- It has been concluded above that "do nothing" (i.e. no Project) is not an alternative solution and that Scottish and UK OWF capacity targets will not be met without The Project's contribution. The existence of the INTOG round does not alter that conclusion.

223. **For all these reasons, reliance on the INTOG Round projects (alone or in aggregate) is not an alternative solution to The Project.**

SCOTWIND

224. In June 2020, CES launched the ScotWind leasing round to grant option agreements for new commercial scale fixed, floating or hybrid offshore wind projects in Scottish waters. A total of 17 ScotWind sites were awarded in January 2022 at a total combined estimated capacity of 24.8 GW (CES, 2022).
225. The site options selected for ScotWind were informed by the Scottish Government's spatial framework set out in the Sectoral Marine Plan for Offshore Wind Energy (SMP). The SMP, set out what are considered by Marine Scotland to be the most suitable and sustainable locations (excluding those previously awarded) for future development of commercial offshore wind energy in Scottish waters. The SMP provided the strategically planned spatial footprint for offshore wind development in Scotland and identified 15 Plan Options ("POs"), split across 4 regions which were considered capable of generating several GW of renewable energy.
226. A strategic plan-level HRA was carried out to underpin the SMP and this is to be updated through an iterative review process and to take account of INTOG (see above). It is understood that the updated plan-level HRA will not be available until winter 2023/2024 (no firm timeline commitment has been made).
227. The following observations are made:

- Even assuming improvement on historic OWF development timescales (see **Figure 6** above), these projects are unlikely to be generating power before 2030. Timescales may increase for some ScotWind projects due to the sites being in deeper waters, as well as the low proportion of fixed offshore wind (a quarter of capacity awarded).
- As noted earlier, there is 3.7GW of ScotWind sites listed with grid connection agreements effective from 2033⁷⁰. While some ScotWind projects aim to be advanced in the late 2020s, challenges remain in securing National Grid connection agreements which could result in delays to some projects. Due to the uncertainty around National Grid connection options and potential supply chain issues it is likely that projects leased through the Scotwind project could have varied timelines for project development. As a result, it is hard to predict how many projects will contribute to 2030 targets with a number of projects likely to come online in the following decade.
- There will be project attrition in the years ahead⁷¹ and not all proposed ScotWind projects will progress on time, or at the full potential capacity. Some projects may not proceed at all.
- The purpose of the ScotWind round is to provide *additional* capacity towards the Scotland target of 8 – 11G and the UK target of 50GW, not make up a "capacity gap" created by a failure to deliver remaining Round 3 projects such as The Project.
- It has been concluded above that "do nothing" (i.e. no The Project) is not an alternative solution and that Scottish and UK OWF capacity targets for 2030 will not be met without The Project's contribution. The existence of the ScotWind does not alter that conclusion.

228. **For all these reasons, it is concluded that reliance on ScotWind projects (alone or in aggregate) is not an alternative solution to The Project in the context of the legal commitments and policy objectives to be delivered by 2030.**

REPOWERING EXISTING OFFSHORE WIND FARMS

229. Most operational wind farms to date typically have an expected operational life span of between 20 and 35 years (although TCE / CES lease periods can be much longer) before either decommissioning or repowering is considered. To date only Blyth OWF has been decommissioned (in 2019, 4 GW). As wind turbine technology continues to evolve and the understanding of turbine condition and performance monitoring grows, OWF assets may be expected to operate for longer periods than originally anticipated. However, it is possible that some existing OWFs will be repowered in the next decade.

230. The following observations are made:

- Even if some of the earliest OWFs (2003 onwards) are repowered in the future (using larger turbines), these will not contribute materially towards the 2030 targets as the majority or at least a proportion of their capacity is already accounted for in the existing baseline.
- Not all existing OWFs will necessarily repower⁷².
- Many of the earlier OWFs (Rounds 1 and 2) are closer to shore and larger/modern scale turbines may give rise to greater landscape and visual impacts, with additional consenting risk.
- Given all the above, it cannot be assumed that repowering will have a material *additive* effect in terms of increasing the baseline of installed OWF capacity, or that it would provide anything approaching 4.1GW of additional/new installed OWF capacity.
- While it could reasonably be assumed that consenting and development timescales will be shorter than for new 'virgin' locations, that may be offset to some degree by downstream complexities around decommissioning (old) / construction (new) stage. Furthermore, to

⁷⁰ Others may have similar connection dates which have not yet made it to the TEC Register.

⁷¹ Analysis in the Applicant's Statement of Need indicates an attrition rate for UK OWF projects in the past has been around 30%.

⁷² Experience onshore shows only 55% of onshore windfarms have been repowered in Scotland and similar proportion across the UK (Renewable UK 2019).

contribute to 2030 targets, any such repowering projects would need to be coming forward in the next few years at the very latest.

- Repowering of existing OWF projects will not achieve The Project core project objective 5 (deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the UK national grid before 2030) nor core project objective 6 (helping ensure the UK energy supply security from the mid-2020s).
- It has been concluded above that “do nothing” (i.e. no Project) is not an alternative solution and that Scottish and UK OWF capacity targets will not be met without The Project’s contribution. The possibility that some existing schemes will repower over the next decade does not alter that conclusion.

231. **For all these reasons, reliance on repowering of existing OWF projects (alone or in aggregate) is not an alternative solution to The Project.**

SUMMARY AND CONCLUSIONS

232. The analysis in this Section 7.3 has demonstrated The Project is critical to achieve the Scottish and UK Government targets for 2030 and there are no alternative offshore locations which constitute feasible alternative solutions to The Project. This conclusion is reached on one or more of the following key grounds:

- Existing / in construction / consented OWF projects form part of the baseline which is ‘baked’ into the 2030 11GW and 50GW installed capacity targets – these projects do not provide additional new installed capacity.
- The Project has a grid connection and is in planning and can substantially contribute during the 2020s. Conversely, even assuming improvements on historic OWF development timescales (see Figure 6 above), OWF projects without a grid connection and not yet in planning are unlikely to be operational before 2030.
- Without The Project’s contribution, Scottish and UK OWF installed capacity targets for 2030 will not be met. There is no other currently proposed single alternative project capable of generating the 4.1 GW of energy of The Project.
- Current and any future OWF leasing rounds are complementary and required in addition (and are not an alternative) to 4.1GW from The Project, given the scale and urgency of the need case (as described in Section 3);
- TCE Extensions Round (2017), Round 4 and the Celtic Sea Round projects do not meet The Project core project objectives 2, 3, 5 or 6.
- There are more complex pathways and cost premiums associated with the floating wind OWF projects (as compared to fixed bottom in shallower waters) that will come forward in the ScotWind, INTOG and Celtic Sea Rounds. Such projects in these rounds do not or are unlikely to meet The Project core project objectives 3, 4, 5 or 6.

Table 12 Performance of alternative locations outside former Firth of Forth zone against project objectives

Alternative Solution	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	<i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	<i>Maximise generation and export capacity within available UK sites</i>	<i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	<i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	<i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the national grid before 2030</i>	<i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
Future leasing rounds	Sites not available to Applicant and any such alternative is hypothetical - when / where / if any further areas of the seabed may be made available by CES or TCE is unknown. Therefore, does not meet any of the Project objectives. Furthermore, a fresh OWF leasing round starting in 2023 would not deliver substantial if any additional installed OWF capacity before 2030. Therefore, does not meet core project objectives 4, 5 and 6.					
Rounds 1, 2 and 3, TCE Extensions Round (2010) and STW	Sites not available to Applicant. Therefore, does not meet any of the Project objectives. Furthermore, operational/ existing and consented OWF projects from earlier leasing rounds form part of existing baseline of OWF installed capacity and do not provide <i>additional</i> installed capacity (as an alternative to The Project) that is required to achieve Scottish and UK OWF capacity targets of 11GW and 50GW respectively.					
Round 4	Not fully met – Round 4 sites do not contribute to Scottish targets	Not met – Round 4 sites not available to Applicant	Not met – Round 4 sites would not make use of seabed in Scottish Waters	Unable to determine at this stage	Unlikely to be met – Round 4 projects unlikely to be generating power before 2030	Unlikely to be met – Round 4 projects unlikely to be generating power before 2030
Celtic Sea	Not met – maximum individual project size is set at 1GW	Unable to determine at this stage	Not met – Celtic Sea sites are for floating technology and would not make use of seabed in Scottish Waters	Not met – fixed bottom deployed this decade is likely to be cheaper than floating wind deployed over coming twenty	Not met – timeline is for build out of projects to occur in the period 2030 – 2035	

Alternative Solution	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	<i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	<i>Maximise generation and export capacity within available UK sites</i>	<i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	<i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	<i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the national grid before 2030</i>	<i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
INTOG	years (see Applicant's Statement of Need).					
	Not met 500MW capacity cap for Innovation projects No individual project will offset 4.1GW from The Project	Unable to determine at this stage	Not met – INTOG projects in deeper water and likely to be floating technology	Not met – as above floating solutions likely to be more expensive than fixed in near term (see section 8.4 of Applicant's Statement of Need).	Not met – TOG projects expected to connect off-grid power to the UK national grid.	Unlikely to be met – INTOG projects unlikely to be generating power before 2030 without significant acceleration of historic development timescales
ScotWind	Not met – ScotWind will contribute to Scottish and UK 2045/2050 targets, but will not provide a large-scale contribution to critical 2030 targets.	Partly met – One ScotWind site available to Applicant	Partly met – Majority of ScotWind sites leased for floating technology.	Not met – fixed bottom deployed this decade is likely to be significantly cheaper than floating offshore wind deployed over the coming twenty years (see section 8.4 of Applicant's Statement of Need).	Unlikely to be met – ScotWind projects unlikely to be generating power before 2030 without significant acceleration of historic development timescales and changes to bring forward grid connection dates	
Repowering	Not met –	Unlikely to be met –	Unable to determine at this stage		Unlikely to be met –	

Alternative Solution	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	<i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	<i>Maximise generation and export capacity within available UK sites</i>	<i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	<i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	<i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the national grid before 2030</i>	<i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
	Not all schemes will repower Even if some OWFs are repowered, these will not contribute materially towards 2030 targets as capacity is largely accounted for in existing baseline.	Earlier OWFs closer to shore and smaller sites and so unlikely to be able to maximise generating capacity using larger turbine no's / models owing to, e.g. landscape and visual impacts.			Any repowering projects would need to be coming forward in the next few years at the very latest and even then are unlikely to be operational by 2030 (on historic development timelines).	

7.4. ALTERNATIVE ARRAY LOCATIONS WITHIN FORMER FIRTH OF FORTH ZONE

233. In arriving at the final site boundary for the Proposed Development, a wide array of alternative options in the former Firth of Forth Zone were considered during an extensive and iterative process which has identified the most suitable, feasible site to achieve the Project's core project objectives.
234. The boundary refinements and final site boundary are shown in Figure 8 below. The approach taken to site selection and project definition involved a number of stages as summarised below.
- stage 1 – Firth of Forth Zone Identification and Award;
 - stage 2 – Zone Appraisal and Planning (ZAP);
 - stage 3 – Project Identification and approval (PIA) Process; and
 - stage 4 – Development of the Proposed Development.
235. Further information on site selection and boundary refinements is presented in Offshore EIA Chapter: Site Selection and Consideration of Alternatives (Volume 1, Chapter 4). Key information is summarised in the following sections below.

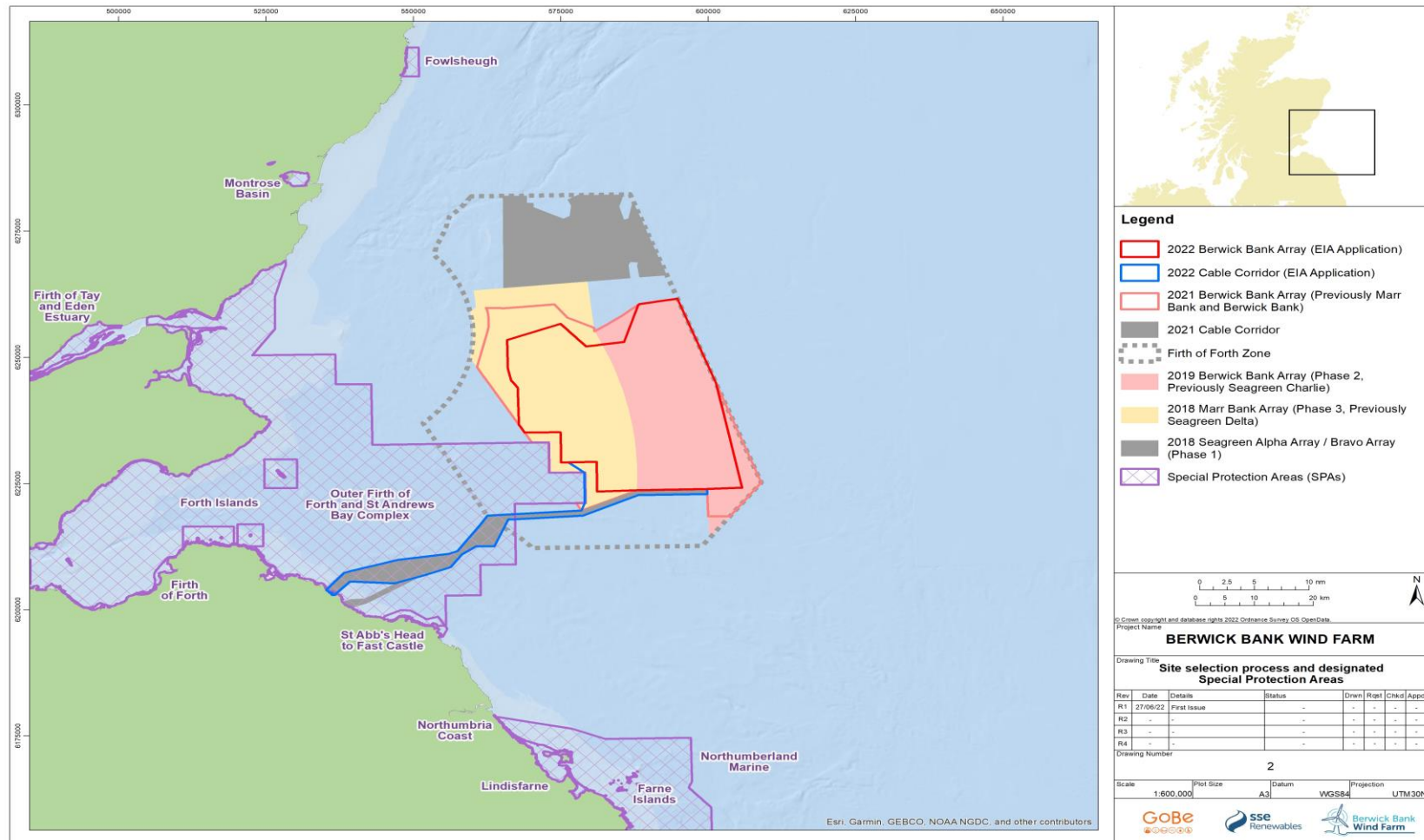


Figure 8 Phased boundary refinement for Firth of Forth Zone projects

IDENTIFICATION OF FIRTH OF FORTH ZONE

236. The former Firth of Forth Zone was a fixed region identified and defined by TCE during Round 3 and leased with exclusive development rights to SSER in 2010.
237. The Round 3 zones were identified, and refined, by TCE through a systematic process of analysis and assessment of spatial data included in their Marine Resource Geographical Information Systems (GIS) System (MaRS) (TCE, 2012).
238. The approach taken by the TCE was to identify zones for offshore wind projects within the broader geographical areas identified by the Offshore Energy Strategic Environment Assessment.
239. During 2008/2009, TCE completed three iterations of its three-stage approach to the delineation of the Round 3 Zones outlined below.
 - Stage 1: Identification and removal of areas identified as being unsuitable for offshore wind due to, e.g. exclusions to development or technical conditions or external interests such as excessive water depths or an International Maritime Organisation shipping lane.
 - Stage 2: Evaluation of remaining areas of seabed to determine suitability based on restrictions present and possible constraints.
 - Stage 3: Outputs from the national scale mapping and modelling then reviewed against other detailed review datasets.
240. During each iteration, the outputs from the modelling were discussed by TCE with key stakeholders. Taking into account feedback from engagement with stakeholders and refinements applied to the mapped data, spatial analysis and review of other datasets, the number of zones identified were reduced from 11 to the final nine Zones, including the Firth of Forth Zone.
241. A Zone Development Agreement was set up between SSER and TCE for the former Firth of Forth, to facilitate delivery of several GWs through several OWFs. The Zone Development Agreement has since been replaced by Agreements for Lease for each OWF project, namely Seagreen Alpha/Bravo and now The Project.
242. The evolution from award of the Firth of Forth Zone to the definition of the final layout of the Proposed Development (basis of this application) is illustrated in Figure 9 below. Further detail on this process is provided in Offshore EIA Chapter: Site Selection and Consideration of Alternatives (Volume 1, Chapter 4), with key stages summarised here.

FIRTH OF FORTH ZONE APPRAISAL (2010-2012)

243. The ZAP process was used to identify sites for individual projects within the Firth of Forth Zone. This was a discretionary, non-statutory process recommended by TCE (TCE, 2012), the aim of which was to:
 - optimise the development opportunity by identifying the most technical and environmentally suitable development sites within the Firth of Forth Zone;
 - promote stakeholder engagement at a strategic level to inform the long-term development strategy; and
 - consider cumulative impacts across the former Firth of Forth Zone, particularly in relation to other offshore wind farm developments.
244. The ZAP process involved detailed mapping and analysis of a range of environmental and technical constraints within, and surrounding, the Firth of Forth Zone. Data considered in the ZAP process included:
 - water depths (UK Hydrographic Office (UKHO) bathymetry dataset) and seabed conditions;
 - wind speed and metocean conditions (Met office 10-year wind dataset);
 - nature conservation designations SPAs, SACs, SSSIs and Important Bird Areas (IBAs);

- ornithological data (data from 24 months of boat based surveys (2009 to 2011) covering the entire Firth of Forth Zone, sightings data from TCE aerial surveys (2009/2010), SPA bird tracking studies (2010);
- benthic and intertidal ecology data;
- fisheries spawning and nursery grounds (Centre for Environment, Fisheries and Aquaculture Science (CEFAS) mapped data);
- marine mammals including cetaceans and seals (18 months boat-based survey sightings 2009 to 2011 for the entire Firth of Forth Zone and sightings data from TCE aerial surveys (2009/2010));
- fisheries activity (Marine Scotland data);
- shipping and navigation — Automated Identification System (AIS) data and radar surveys (summer and winter 2010 to 2011 completed by the Forth and Tay Offshore Wind Developers Group (FTOWDG);
- seascape and landscape – landscape designations and protected areas;
- marine archaeology and cultural heritage;
- aviation and telecommunications issues, including civil and military aspects;
- oil and gas infrastructure;
- emergency services; and
- cables and pipelines.

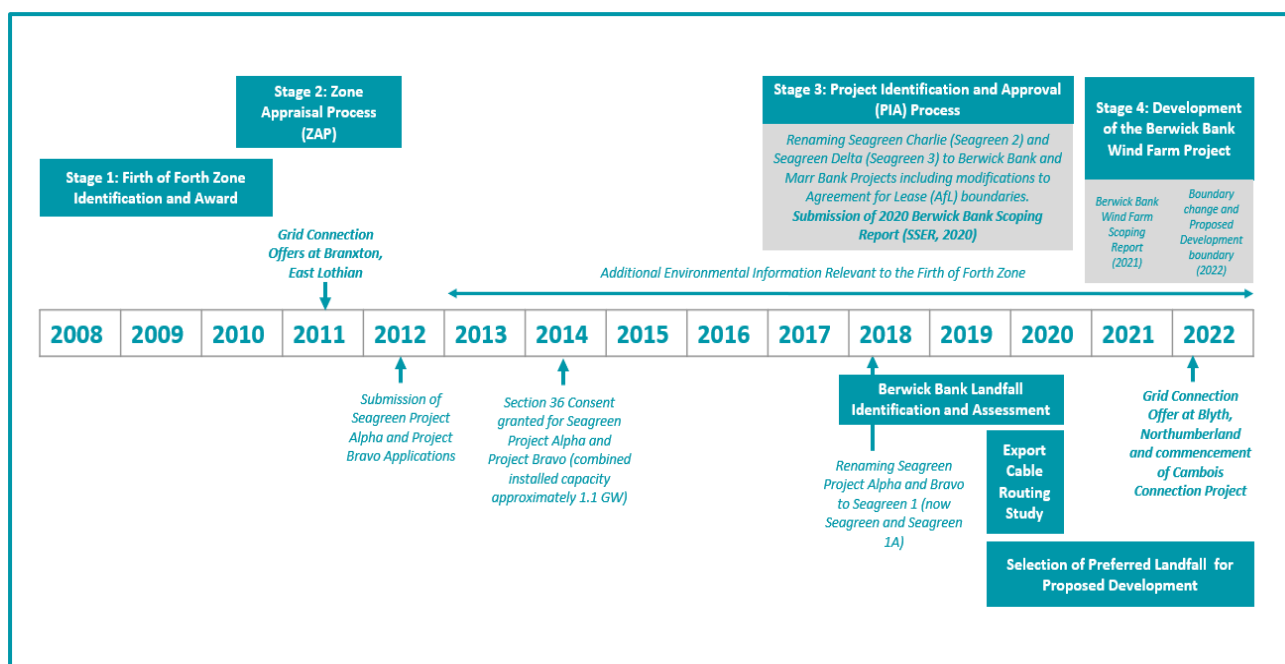


Figure 9 Approach to Site Selection and Project Definition

245. The outcome from the ZAP process was the division of the Firth of Forth Zone into three areas which would be developed in phases. These areas are illustrated in Figure 10 below.

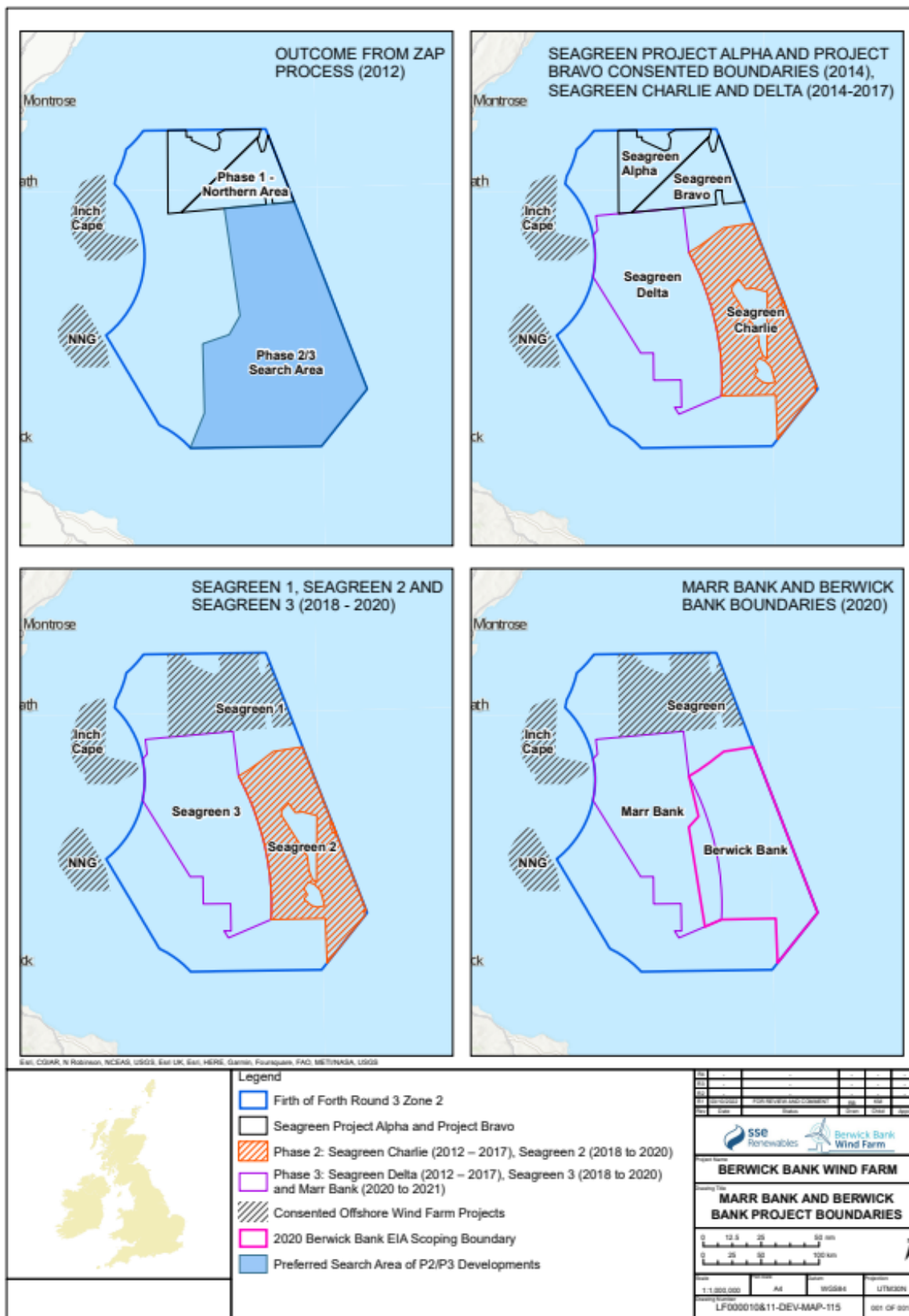


Figure 10 Evolution of Project Boundaries and Names in the Firth of Forth Zone from 2010 to 2020

PROJECT IDENTIFICATION AND APPROVAL (2017 – 2020)

246. The Project Identification and approval (PIA) process commenced in 2017 and further refined boundaries for each of the three prioritised sites, primarily due to a greater understanding of environmental constraints and impacts and through stakeholder engagement.
247. The PIA process involved the following:
- identification of areas largely beyond the foraging range of key seabird species;
 - review and analysis of available boat based ornithology survey results;
 - review and analysis of 2010 and 2011 metocean survey data acquired across the entire Firth of Forth Zone by Seagreen;
 - review and analysis of 2012 nearshore measurements and wavebuoy data;
 - consideration of other conservation interests (including new nature conservation designations - Firth of Forth and St. Andrews Bay Complex SPA, Firth of Forth Banks Complex NCMPA and SNS SAC) to determine extent and nature of potential interactions with these designations);
 - analysis of water depths; and
 - consideration of separation distance from Seagreen 1, Seagreen 1A Project and adjacent STW projects.
248. The outcome from the 2017 PIA process was the identification of two separate 1 GW projects within Phases 2 and 3 (Seagreen Charlie and Seagreen Delta respectively).
249. In 2018, SSER carried out analysis on the boat based ornithological survey data obtained for the Firth of Forth Zone, and ornithological data from the other Forth and Tay projects. From this analysis it emerged that there is potential for areas of ornithologically sensitivity to overlap the Phase 3 part of the Firth of Forth Zone (referred to as Seagreen Delta at the time, prior to becoming Seagreen 3 in 2018 and then Marr Bank in 2020). However, taking into account these ornithological sensitivities, it was concluded that, based on the published review of collision avoidance rates (BTO, 2014), sufficient 'headroom'⁷³ was potentially available for further offshore wind farm development in the Forth and Tay region.
250. Having identified the potential for ornithological headroom, the PIA was further progressed to consider advances in wind turbine technology including the deployment of fewer, larger wind turbines (e.g. wind turbines with capacity of more than 10 MW) to deliver the same project capacity and the ability to increase the minimum sea level to blade tip clearance (air gap) from the standard 22 m towards 30 m or more.
251. Whilst progressing the PIA, all three of the Forth and Tay projects applied to vary their Section 36 consents to use fewer, larger wind turbines capable of generating the same capacity as the consented designs, reducing potential impacts on ornithology. The variations are summarised in Offshore EIA Chapter: Site Selection and Consideration of Alternatives (Volume 1, Chapter 4).
252. Importantly, for each project, it was concluded in the AA that there would be a reduction in the predicted collision impacts due to the use of fewer larger wind turbines. As such, considerable headroom in the region has been released through the revised Forth and Tay consents, with further potential headroom available from current and ongoing empirical research designed to reduce uncertainty in ornithology assessments, and from as-built versus consented designs outside of the Forth and Tay region as explored through the Offshore Wind Evidence and Change Programme.

⁷³ Headroom is the difference between predicted levels of mortality based on worst case parameters used at the application stage and mortality rates based on 'as built' project designs (built v assessed or consented wind farm designs) (Trinder, 2017).

IDENTIFICATION OF MARR BANK AND BERWICK BANK (2020)

253. Having confirmed that there is ornithological headroom available within the Firth of Forth Zone, SSER took the decision to progress development of the Phase 2 and 3 areas.
254. Following a number of internal boundary reviews and project iterations it was determined that the two projects identified within these Phase 2 and 3 areas (Seagreen 2 and 3) would be renamed Berwick Bank and Marr Bank respectively.
255. In August 2020, an Offshore EIA Scoping Report (SSER, 2020a) was submitted to MS-LOT for an offshore wind farm project within the Phase 2 area (2020 Berwick Bank). Although the Phase 3 area (Marr Bank) was also being progressed it was at an earlier stage of development.

DEVELOPMENT AND REFINEMENT OF THE PROPOSED DEVELOPMENT (2021-202)

256. The stages in the development and refinement of the Proposed Development from submission of the 2020 Berwick Bank Wind Farm Offshore EIA Scoping Report in August 2020 to finalisation of the Proposed Development boundary included in this application (May 2022) are summarised in Table 4.7 of EIA Chapter 4 (Volume 1).
257. In summary, in response to feedback received from stakeholders advising that it would be preferable to combine the boundaries of the 2020 Berwick Bank and Marr Bank projects into one single project, the Applicant commenced a detailed site assessment and refinement study. This study (March 2021 to October 2021) focused specifically on the exploration of options for maximising capacity within the Berwick Bank Wind Farm boundary whilst reducing potential effects on ornithology and other key receptors.
258. To reduce effects on ornithology, analysis of a subset of the ornithological aerial survey data was undertaken to identify 'hotspots' for key species. Where possible, overlaps with these 'hotspots' were avoided or minimised. Consideration was also given to options to minimise potential barrier effects (including cumulatively with other Forth and Tay projects) for key species such as gannet.
259. Combining the 2020 Berwick Bank and Marr Bank boundaries to create the Proposed Development provided the Applicant with an opportunity to:
 - **Reduce the overall footprint of the array area:** The combined total area of Marr Bank + Berwick Bank was 1,441 km². Through refinements, to avoid/reduce overlap with sensitive areas and features, the Berwick Bank boundary reduced by 9%, to 1,314 km²
 - **Avoid areas of higher ornithological activity:** through boundary refinements focused on the northern and north-eastern boundaries which overlap areas which may be associated with feeding grounds.
 - **Increase the buffer between the Berwick Bank Wind Farm and the other Forth and Tay projects** (Inch Cape Offshore Wind Farm, Seagreen 1 and Seagreen 1A Project): This increased the area of open sea available for birds to pass through the area, reducing potential barrier effects.
260. Development of the Proposed Development boundary was also necessarily informed by detailed engineering site studies, including preliminary assessment of ground conditions for the installation of preferred foundation options (suction caissons and jackets). This was necessary to ensure suitability of ground conditions including the associated consideration of the effects on the LCoE. The site assessment and refinement study culminated in the submission of the Berwick Bank Wind Farm Offshore EIA Scoping Report (SSER, 2021a) to MS-LOT in October 2021.

BOUNDARY CHANGE - PROPOSED DEVELOPMENT BOUNDARY (MAY 2022)

261. In March 2022 a boundary review process was initiated to explore options for further reducing impacts, whilst meeting The Proposed Development's overarching aims and objectives. This process concluded in late May 2022, resulting in a further 23% reduction of the array area (from 1,314 km² to 1,010.2 km²). A comparison with the previous site boundary is shown on Figure 8 above and Figure 11 below.
262. Key environmental benefits influencing the boundary change are summarised in Offshore EIA Chapter: Site Selection and Consideration of Alternatives (Volume 1, Chapter 4) but, so far as relevant to this Report, the change resulted in the removal of identified areas of high utilisation of seabirds (potential foraging hotspots) in the north of the array area and in western and south-western part of the array area, in particular for guillemot and kittiwake.
263. The boundary change, which resulted in a deepening of the northern notch by moving the north-western and northern boundary further south, and removal of the south-western corner was calculated to result in a >20% reduction in ornithological displacement impacts. Changes to the north-western boundary also reduced the extent to which the array area overlapped the Firth of Forth Complex ncMarine Protected Area (MPA). Features associated with the ncMPA were identified in the data sources above as typically being more frequently used by seabirds compared to areas further offshore (as a function of being closer to breeding SPA populations). The ornithological benefit of removing this area from the site boundary include a reduction in displacement impacts and slight reduction in modelled collision mortality, through an overall reduction in seabird densities figures.
264. The 'stepped' south-eastern boundary of the array area was originally delineated by the Outer Firth of Forth and St Andrew's Bay SPA. As part of the boundary change, a 2 km buffer between the Outer Firth of Forth and St Andrew's Bay SPA and the Proposed Development was added to ensure that there is no direct overlap relating to this site.

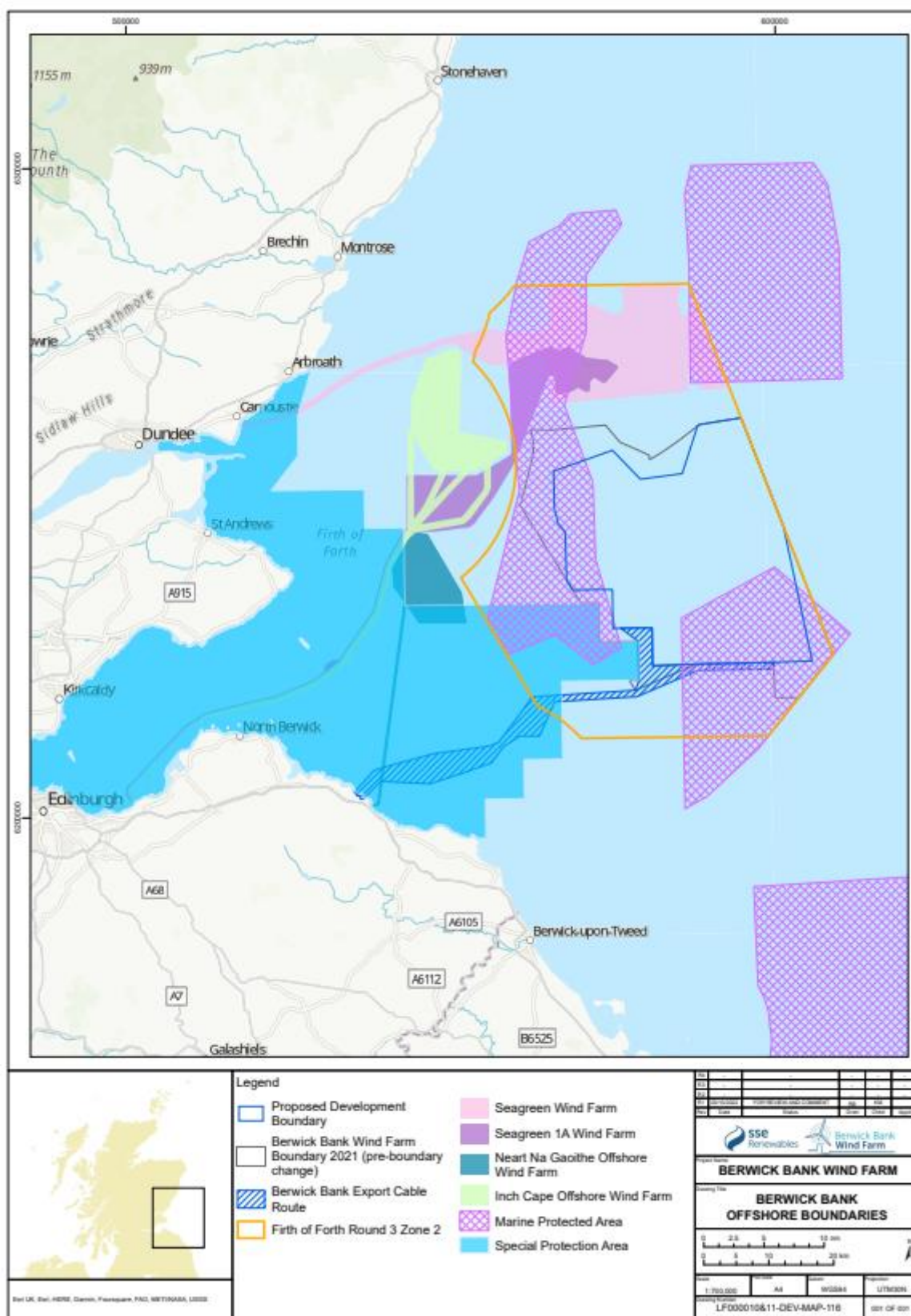


Figure 11 Influence of Firth of Forth Banks Complex ncMPA and Outer Firth of Forth and St Andrew's Bay SPA on boundary

CONCLUSIONS

265. The preceding sections demonstrate that the final site boundary for the Proposed Development was the result of an iterative, careful and exhaustive process, one that supports the conclusion that there are no feasible alternative locations remaining within the former Firth of Forth Zone to achieve The Proposed Development core project objectives. This conclusion is reached on the following key grounds:

- The northern portion of the former Firth of Forth Zone has already been developed (Seagreen and Seagreen 1A) and is no longer available.
- Given the foraging range and behaviour of a number of the qualifying species of the affected SPAs, all possible locations for commercial scale OWFs within the former Firth of Forth Zone have connectivity with one or more species from the SPAs. There is no location within the former Firth of Forth Zone that could be developed without impacts on species from these SPAs.
- Locations further to the west would be in closer proximity to or encroach upon the closest SPA, and overlap to a greater degree with an MPA and give rise to greater impact on shipping and navigation⁷⁴ and commercial fishing interests.
- Locations further south would remain in similar proximity to or encroach upon the SPA (and overlap to a greater degree with an MPA).

266. Summary of the performance of array alternatives within the former Firth of Forth zone is provided below in Table 13.

Table 13 Performance of alternative locations within the former Firth of Forth zone against project objectives

Alternative Solution	Objective 1 <i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	Objective 2 <i>Maximise generation and export capacity within available UK sites</i>	Objective 3 <i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	Objective 4 <i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	Objective 5 <i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the national grid before 2030</i>	Objective 6 <i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
Alternative location within former Firth of Forth Zone	No feasible alternative site to deliver a large OWF	No feasible alternative site – would not maximise generation and export capacity	No feasible alternative site – would not make efficient use of seabed	No feasible alternative site – would not be at lowest possible consumer cost	No feasible alternative site – would not provide significant volume of new low carbon energy	No feasible alternative site – no contribution to UK energy security.

⁷⁴ The boundary change increased the minimum gap between the Proposed Development and Inch Cape from 2.4 nm to 4.2 nm at the closet point, and a straightening (in a north to south direction) of the corridor, thus benefiting vessels navigating in the area. A failure to demonstrate navigational risk is ALARP is an issue that could determine whether consent(s) are granted and therefore goes to legal and technical feasibility of an alternative.

7.5. ALTERNATIVE DESIGN SOLUTIONS FOR THE PROPOSED DEVELOPMENT

MARKET CONTEXT

267. The scale and urgency of the need for offshore wind as described earlier in Section 3 of this Report necessitates solutions that maximise the feasible installable capacity at each available offshore site.
268. Constraining projects within Zones/ sites made available for OWF by TCE or CES will result in sub-optimal and inefficient use of areas of seabed identified as being least constrained / most suitable. That of itself is contrary to fundamental policy aims and objectives articulated in Section 3 of this Report. Moreover, if the available and least-constrained seabed areas are used sub-optimally, more projects need to be delivered in ever more challenging and constrained locations.
269. The consideration of alternative solutions must be approached on a reasonable basis and must be grounded in real world considerations of feasibility (legally, technically and commercially). These decisions involve the exercise of a degree of judgement, drawing on experience and available information and analysis of future market trends.
270. In this context it is relevant and reasonable for the Scottish Ministers to place weight on the experience and expertise of the Applicant in offshore wind development. SSE Renewables is a world-leading developer, operator and owner of offshore wind energy. SSER developed the 588MW Beatrice offshore wind farm, which became fully operational in June 2019. Beatrice is Scotland's second largest offshore wind farm and its 84 wind turbines are capable of providing enough wind powered electricity for up to 450,000 homes. With a capital expenditure of around £2.5bn, Beatrice was also one of the largest ever private investments in Scottish infrastructure and was delivered on time and under budget. SSER is currently building the world's largest offshore wind energy project of capacity 3.6GW (Dogger Bank wind Farm) and Scotland's largest and deepest fixed bottom offshore site (Seagreen OWF). When complete these projects will power millions of UK homes and businesses and add to SSER's existing 487 MW offshore wind portfolio. SSER is also actively pursuing offshore wind projects in Denmark, Poland, Spain and Portugal.
271. The nature and viable scale of an OWF has to be considered in the context of the specific characteristics of the individual site (e.g. water depths), grid connection availability and the highly competitive commercial framework within which such projects are delivered. In addition to environmental impacts, factors which have influenced the PDE include:
- grid connection availability and capacity (4.1GW in this case);
 - viable generation capacity (GW size) to optimise secured grid connection capacity;
 - commercial expectations prescribed by funding mechanisms (such as CfD);
 - construction costs of array, transmission and grid connection;
 - technology availability, cost and reliability;
 - health and safety considerations;
 - supply chain capacity and availability; and
 - project execution schedule (relative to Scottish and UK targets, e.g. for 2030).
272. In this context, the Applicant has continued to re-appraise all elements of the PDE for The Proposed Development, to ensure that all feasible mitigation has been deployed. The Proposed Development has adopted commitments (primary design principles inherent as part of The Proposed Development, installation techniques and engineering designs/modifications) as part of their pre-application phase, to eliminate and/or reduce the negative effects arising from a number of impacts (as far as possible). These are outlined in full in the Enhancement, Mitigation and Monitoring Commitments Register in Volume 3 Appendix 6.3 of the EIA.
273. The final PDE for The Proposed Development is informed by expert judgement and market leading expertise of the realities and challenges of construction in the marine environment.

The Applicant believes that the vast experience it has in offshore wind delivery in the UK and overseas, combined with the evidence below, should give the Scottish Ministers confidence that the Applicant has considered all feasible options to avoid or reduce harm to European sites whilst ensuring a viable and deliverable project.

SCOPE OF CONSIDERATION OF ALTERNATIVE DESIGN

274. The scope to resort to feasible alternative solutions has been considered throughout the development process for The Proposed Development. This has been a fundamental driver for decision making, from the technical options in engineering through to macro-siting (avoidance of large-scale features and designated sites).
275. Details of refinements to date to the PDE are set out in Offshore EIA: Chapter 4: Site Selection and Consideration of Alternatives (Volume 1, Chapter 4).
276. The identified AEOL would arise from collision and/or displacement risk related to the operation of wind turbines, and so the primary project design parameters which may influence these impact pathways during operation are considered to be:
 - Array location (relative to SPA);
 - Array size / number of turbines;
 - Height of turbine blades above sea surface.
277. The justification for the Proposed Development array location (and the absence of feasible alternative locations) has been set out in preceding Section 7.4 of this Report. Accordingly, the further potential alternative design solutions considered during this stage of the Derogation Case are:
 - A reduced/refined or alternative developable array area - aimed at further reducing/refining the geographical extent of the wind turbines to avoid sensitive areas for seabirds;
 - A reduced number of turbines (and/or a change in their layout) - aimed at reducing the scale of potential effects from the wind turbines; and
 - A higher minimum lower tip height (height of turbine blades above sea surface) – which reduces collisions by raising the rotor to heights where bird densities are lower due to the skewed nature of bird flight height distribution⁷⁵.

REDUCTION OF DEVELOPABLE ARRAY AREA / TURBINE NUMBERS

278. The Applicant has carefully considered the size of the array area and the number of turbines taken forward to consent application. This has necessarily involved balancing environmental, engineering and economic constraints, access to other marine users, consenting and commercial considerations, alongside technical feasibility for construction.
279. Reducing ornithological impacts on the affected SPAs has been a key driver of the site refinement process and resulted in two site boundary changes (described in Section 7.4 above) which reduced the overall developable area by 9% (first refinement) and then by a further 20% (second refinement). That reduced the footprint overlapping areas of higher ornithological activity associated with feeding grounds; and created a wider passage for birds through the sites and adjacent OWFs to reduce barrier effects.
280. The assessment of effects on ornithological receptors is based on a resultant worst-case scenario, which is a maximum of 307 wind turbines, a minimum turbine spacing of 1,000m, at turbine parameters indicative of a minimum 14 MW turbine.
281. It is acknowledged that array size / density / wind turbine numbers have an influence on both displacement and collision risk impacts, with impacts increasing as wind turbine numbers increase. Indeed, this informed the site boundary reductions described above and

⁷⁵ Johnston et al., 2014

- the selection of turbine parameters indicative of a minimum 14GW turbine (increased from a previous minimum of 10MW, to minimise the number of turbines).
282. Potential impacts can therefore in theory always be further and further reduced with a corresponding decrease in array footprint / wind turbine numbers. However, it is necessary to consider technical requirements and market conditions (e.g. turbine availability), and the consequent risk that several core project objectives would no longer be achieved. Turbine procurement and availability are significant considerations in this regard.
 283. It is not possible at this stage to further reduce turbine numbers and, consequently, not possible to further reduce the array developable area, because the accelerated development timeline for the Proposed Development makes it critical for the PDE to encompass turbine models which the Applicant is confident can be procured cost effectively and will be available within the Proposed Development's delivery timelines (both of which flow from making an order at sufficient scale). This engineering and commercial flexibility is essential to secure a competitive and deliverable project in the 2020s.
 284. Any reduction in developable area / minimum turbine numbers at this stage gives rise to an unacceptable risk of one or more of the following outcomes:
 - Failure to achieve 4.1GW installed capacity;
 - Failure to maximise export cable capacity and grid connection capacity;
 - Inefficient use of seabed (lower overall capacity);
 - Reduced flexibility to 'micro-site' turbine locations to optimise array layout, e.g. to account for ground conditions, to avoid any previously unknown constraints (e.g. UXO) or to accommodate other sea users;
 - Suboptimal array layout / failure to maximise energy yield, with a higher density turbine layout within a reduced array area, potentially causing wake loss effects that decrease productivity and increase cost of electricity;
 - Delays (and consequent additional cost) owing to lack of turbine availability when needed;
 - Failure to maximise economies of scale, restricting ability to decrease the LCoE over that established in recent CfD auction rounds and achieve a further decrease in generation cost per MW;
 - Jeopardise the Applicant's ability to be able to put forward a competitive proposition in a future CfD auction round.
 285. A further reduction to the proposed maximum of 307 turbines is accordingly not considered feasible. Optimising the business case to fulfil the Proposed Development need and objectives is essential to develop a viable project. The Proposed Development must compete for a CfD in a competitive tender – without which it may not attract finance to be constructed and therefore not contribute to the mitigation of the "climate emergency" and would not help to address security of energy supply risks.
 286. The Proposed Development has secured grid connection capacity for 4.1GW and for urgent decarbonisation and security of supply reasons it is important to maximise that available export capacity and bring as much low carbon electricity online as quickly as possible, and before 2030. A failure to maximise the generation and export capacities of The Proposed Development is not compatible with the core project objectives or the urgent need which they serve.
 287. A lower capacity at The Proposed Development would also have a ratcheting effect on the number and capacity of additional OWFs required in order to hit Net Zero and corresponding timescales. Delivering low carbon generation capacity later than is achievable allows time for carbon emissions to further accumulate increasing the magnitude of subsequent action required.
 288. **For all these reasons, further array area or turbine reductions are not feasible alternative solutions.**

Table 14 Performance of alternative array / turbine design options against project objectives

Alternative Solution	Objective 1 <i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	Objective 2 <i>Maximise generation and export capacity within available UK sites</i>	Objective 3 <i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	Objective 4 <i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	Objective 5 <i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the national grid before 2030</i>	Objective 6 <i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
Reduce array developable area	Reduced scale of OWF with correspondingly reduced/diminished contribution to Scottish and UK decarbonisation targets.	Fewer turbines / reduced array area would not maximise generation and export capacity within an available site	Fewer turbines / reduced area would not make efficient use of the limited available seabed for fixed foundation OWFs in Scottish waters	Likely increasing cost to the consumer. Reduced flexibility and constraints on scale and layout of The Proposed Development adversely affect (e.g. turbine density, wake effects, micro-siting), adding risk of cost/delay in turbine procurement and availability, and affect economy of scale.	Reduced scale of OWF with correspondingly reduced/diminished contribution to Scottish and UK decarbonisation targets. Risk of delays in turbine procurement / availability, contrary to objective to delivery substantial contribution as soon as possible, and before 2030	Contribution to critical UK energy security adversely affected by: Reduced scale of OWF with correspondingly reduced/diminished contribution to Scottish and UK energy security of supply. Risk of delays in turbine procurement / availability, contrary to objective to delivery contribution as soon as possible.
Reduce maximum turbine numbers	Ratcheting effect on the number and capacity of additional OWFs and timescales to hit Net Zero; delays in delivery of low carbon generation allows time for carbon emissions to accumulate, increasing magnitude of subsequent action required					

INCREASE MINIMUM LOWER TIP HEIGHT

289. The iterative project design process has culminated in raised turbine blade lower tip height of 37m above Lowest Astronomical Tide (LAT). The current 37m above LAT 'is a material design change (i.e. alternative design solution) that has been implemented and increases the 'air draught' by 15m as compared to the former Berwick and Marr Bank projects blade tip to sea clearance of 22m above LAT.
290. This has delivered significant mitigation of collision risk impact. Moving the rotor swept area to altitudes where seabird densities are lower due to the skewed nature of bird flight height distribution⁷⁶ has significantly reduced the impact, by minimising the risk of collision for the key seabird species in flight so far as feasible within the current bounds of technical and economic viability of the Proposed Development.

⁷⁶ Johnston et al., 2014

291. A minimum air draught of 37 m LAT is considered to be the maximum technically feasible in the circumstances of the Proposed Development. Increasing the *minimum* air-draught beyond 37m above LAT would have implications on technical aspects, the related supply chain and consequent commercial implications. Further reduction in the intersection of the swept path with flight zones is considered to be unachievable, as vessels do not currently have the capability to achieve installation at this height in the conditions set within The Proposed Development. This is due to a combination of water depth (jack-up legs) and turbine height (crane height)).
292. Therefore, any further increase in air draught height is not currently feasible and would unacceptably increase the Proposed Development 's costs and supply chain risk, which would jeopardise early delivery of low-cost generation for the benefit of UK electricity consumers.

Table 15 Performance of alternative turbine rotor design option against project objectives

Alternative Solution	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5	Objective 6
	<i>Develop a large-scale OWF to generate low carbon electricity to support Scottish and UK decarbonisation targets</i>	<i>Maximise generation and export capacity within available UK sites</i>	<i>Make efficient use of very limited seabed available for fixed foundation OWFs in Scottish waters</i>	<i>Deliver low carbon electricity at the lowest possible cost to the UK consumer</i>	<i>Deliver a significant volume of new low carbon electricity generation as soon as possible, with a substantial contribution to the national grid before 2030</i>	<i>Helping ensure UK energy supply security from the mid 2020s through increasing the proportion of electricity coming from domestic renewables and thus reducing exposure to volatile fossil fuel markets</i>
Increase air draught	37m clearance is maximum technically and commercially feasible in circumstances of The Proposed Development. Therefore, going beyond that is not feasible and would not meet any of the core project objectives.					

8. NO ALTERNATIVE SOLUTIONS CASE: STEP 4 - COMPARATIVE ANALYSIS

293. In this case, Steps 1 – 3 have not identified any feasible alternative solutions to The Proposed Development which require to be assessed. Accordingly, Step 4 is not required.
294. **It follows that there are no feasible alternatives to The Proposed Development.**

9. SUMMARY OF PART B: NO ALTERNATIVE SOLUTIONS

296. An exhaustive design and mitigation process underpins the PDE for The Proposed Development.
297. Sections 6 and 7 above address the range of potential alternatives considered by the Applicant in determining the PDE for the Proposed Development. A total of eight potential alternative solutions have been considered but discounted for the reasons set out in PART B above, as summarised in Table 16 below.
298. This demonstrates to the Scottish Ministers that there are no feasible alternative solutions to The Proposed Development.
299. This overall conclusion reflects the need for and benefits of The Proposed Development as described in section 3 of this Report, which include:
- An estimated 4.1GW, delivering enough low-carbon electricity to power more than 5 million homes each year, starting from 2026.
 - A substantial near-term (2020s) contribution to decarbonisation, offsetting millions of tonnes of CO2 emissions per annum from 2026.
 - The Proposed Development is the only Scottish offshore wind project of significant scale which is proposed to commission between 2025 and 2030⁷⁷, which can “plug the gap” between Scottish CfD AR3 developments and ScotWind developments.
 - Significant contribution to energy security of supply and affordability: if developed at its full technically achievable capacity, The Proposed Development would provide enough energy to replace 19% of Russian gas imports to the UK.
 - Low cost to consumer owing to efficiencies from large scale, location closer to shore in shallower waters and use of proven fixed foundation technology
300. The Proposed Development is an essential part of the future Scottish and UK generation mix.

Table 16 Summary of potential alternative options discounted for The Proposed Development.

Category	Alternative Option Considered	Summary of Key Reason(s) Alternative Option Discounted
Do nothing	Do not develop The Proposed Development	- Ignores and does not respond to urgent need for offshore wind at scale - Loss of 4.1GW - Scottish and UK 2030 targets not met - Does not deliver any of the core project objectives
	Array location outside of UK REZ	- Not legally feasible: no such location available to Applicant - Ignores and does not respond to urgent need for offshore wind at scale - Scottish and UK 2030 targets not met - Does not deliver any of the core project objectives
Alternative location	UK array location outside of former Firth of Forth Zone	- Not legally feasible: no such location currently available to Applicant (other than ScotWind) - Timing: Leasing rounds underway now (e.g. Celtic Sea and (for the most part) ScotWind) or in future (INTOG) will not

⁷⁷ Apart from 0.8GW from a recent ScotWind lease winner, currently hoped to commission in 2029.

Category	Alternative Option Considered	Summary of Key Reason(s) Alternative Option Discounted
		deliver projects until 2030s - does not respond to urgent UK and Scottish need during critical 2020s and do not meet core project objectives 5 or 6. - Without The Proposed Development (4.1GW), Scottish and UK 2030 targets not met - Any/ all such locations and potential capacity (e.g. Round 4, ScotWind) additional and not alternatives to The Proposed Development - Cost: Floating projects (Celtic Sea; majority of ScotWind capacity) and those in deeper waters (ScotWind, INTOG) unlikely to be delivered at lower cost than The Proposed Development and do not meet core project objective 4. - TCE Extensions Round (2017), Round 4 and Celtic Sea locations would not make use of locations in Scottish waters for fixed foundations and do not meet core project objective 3.
	Alternative location inside former Firth of Forth Zone	- Northern portion of the former Firth of Forth Zone already developed (Seagreen and Seagreen 1A) and no longer available. - HRA: all possible locations for commercial scale OWFs within the former Firth of Forth Zone have connectivity with one or more species from the SPAs. None that could be developed without adverse effects on species from affected SPAs. - Locations further west would be closer to or encroach upon the closest SPA (and overlap to a greater degree with an MPA and give rise to greater impact on shipping and navigation⁷⁸ and commercial fishing interests). - Locations further south remain in similar proximity to or encroach upon the SPA (and overlap to a greater degree with an MPA).
	Repowering of Existing OWF sites	- Unlikely to contribute substantial <i>new</i> or <i>additional</i> installed capacity; fail to meet core project objectives 4, 5 or 6: - o proportion of capacity already accounted for as part of baseline capacity, - o not all existing OWFs will necessarily repower. - o Many earlier OWFs (Rounds 1 and 2) are close to shore and larger/modern scale turbines may not be feasible (e.g. unconsentable due to landscape and visual impacts).

⁷⁸ The boundary change increased the minimum gap between the Proposed Development and Inch Cape from 2.4 nm to 4.2 nm at the closet point, benefiting vessels navigating in the area. A failure to demonstrate navigational risk is ALARP, which goes to legal and technical feasibility of an alternative.

Category	Alternative Option Considered	Summary of Key Reason(s) Alternative Option Discounted
Alternative Design		- Timing: unlikely to come on-stream before 2030 - does not respond to urgent UK and Scottish need during critical 2020s and do not meet core project objectives 5 or 6. - Loss of 4.1GW: Scottish and UK 2030 targets not met
	Reduction in developable array area	- Ignores and does not respond to urgent need for offshore wind at scale - Reduction in 4.1GW - Scottish and UK 2030 targets not met - Does not deliver core project objectives 1 or 2 (maximise generation and export capacities)
	Reduction in number of turbines and/ or alternative layout	- Does not deliver core project objective 3 (efficient use of very limited seabed available in Scottish waters) - Not feasible (financial grounds)
	Increase in minimum lower tip height	- Not feasible (technical and financial grounds) - Does not deliver core project objective 4
	Operational Constraint/ shutdown(s)	- Ignores and does not respond to urgent need for offshore wind at scale - Not feasible (technical and financial grounds) - Reduction in availability of 4.1GW - does not deliver core project objectives 2, 3, 4 or 6

PART C: IMPERATIVE REASONS FOR OVERRIDING PUBLIC INTEREST

10. INTRODUCTION TO IROPI

10.1. OVERVIEW

301. This PART C of this Report provides the evidence which demonstrates that the Scottish Ministers can be satisfied that there are IROPI to authorise The Proposed Development.
302. It is concluded that there is a compelling case that The Proposed Development must be carried out for IROPI, which are fundamental to achieve Scottish and UK Governments' legal commitments and policy objectives.
303. The IROPI case is supported by and draws in particular upon the following documents which accompany the different planning applications for the Project:
 - Statement of Need;
 - Offshore Planning Statement;
 - Offshore EIA: Socio-economics Chapter (Volume 2 Chapter 18);
 - Onshore EIA: Socio-economics Chapter (Volume 2 Chapter 13); and
 - Socio-Economics and Tourism Technical Report (Volume 3 Appendix 18.1).

10.2. APPROACH TO STAGE 3B: IROPI

304. The Habitats Regulations provide that the Scottish Ministers may agree to The Proposed Development if "satisfied" that it "must be carried out for imperative reasons of overriding public interest (which...may be of a social or economic nature)..."⁷⁹
305. It is important to note in this case that the RIAA does not identify any AEOI in respect of priority habitat types or species.
306. However, as a barometer, it is helpful to note that where a priority habitat or species is adversely affected, the Habitats Regulations provide that "*reasons relating to human health, public safety or beneficial consequences of primary importance to the environment*" can constitute IROPI of greater importance than the nature conservation objective of protecting priority habitats/ species.
307. Beyond the above, the Habitats Regulations do not define the scope or nature of IROPI that may be relied upon, and it is necessary to consider the limited case law, EC opinions, guidance, and previous decisions, so far as relevant.

A BALANCING EXERCISE

308. In terms of the nature of the exercise, the IROPI stage involves a balance of interests between the conservation objectives of the European site affected and the reasons for the project proceeding, and the competent authority must be satisfied that the balance weighs in favour of the latter⁸⁰.
309. This has been confirmed by the ECJ in several cases, for example in C-43/10 (2012):

"An interest capable of justifying, for the purposes of Article 6(4) of Directive 92/43, the implementation of a plan or project must be both 'public' and 'overriding', which means

⁷⁹ Regulation 29(1), the Conservation of Offshore Marine Habitats and Species Regulations 2017.

⁸⁰ See MN 2000 (2018) at section 5.3.2

*that it must be of such an importance that it can be weighed against that directive's objective of the conservation of natural habitats and wild fauna, including birds, and flora"*⁸¹

310. In C-239/04⁸², in his Opinion, Advocate General Kokott put it this way:

"The necessity of striking a balance result in particular from the concept of "override", but also from the word "imperative". Reasons of public interest can imperatively override the protection of a site only when greater importance attaches to them. This too has its equivalent in the test of proportionality, since under that principle the disadvantages caused must not be disproportionate to the aims pursued."

THE COMPONENTS OF IROPI

311. The components of IROPI which inform this balancing exercise are explored in MN 2000 (2018) and Defra (2012). Drawing from those, the following principles can be distilled:

- Public Interest
 - The interest(s) served must be a public interest rather than a solely private interest. However, a private interest can coincide with delivery of a public objective and projects developed by private bodies can be authorised if public interests are served.
- Long-term
 - The public interest would normally (but not always) be long-term; short-term interests are less likely to be overriding because the conservation objectives of the Habitats and Birds Directives / Habitats Regulations are long term interests.
- Imperative
 - There should be urgency to the objective(s) and its or their achievement should be "indispensable" (MN 2000) or "essential" (Defra). In practical terms, according to MN 2000, this may be demonstrated if the objective falls within a framework for one or more of the following:
 - actions or policies aiming to protect fundamental values for citizens' life (health, safety, environment);
 - fundamental policies for the State and the Society; or
 - activities of an economic or social nature, fulfilling specific obligations of public service.
 - Defra (2012) similarly advises that national policy and other documents setting out government policy may provide important context for the competent authority when considering whether there are IROPI and that projects which enact or contribute towards national plans or policies are more likely to imbue a high level of public interest.
- Overriding
 - The public interest of proceeding with a project must outweigh the public interest of conservation of the relevant European site(s). The recent DTA guidance (2021a: in draft) considers this in the context of offshore windfarms, expanding on EC and Defra guidance as follows:
 - **Climate change:** "considerable weight should be given to their contributions to limiting climate change in accordance with the objectives of [climate change targets]" and "wind farm proposals deliver a national scale public interest on the grounds of energy security and supply as well as beneficial consequences of primary importance to the environment in respect of climate change";

⁸¹ *Nomarchiaki Aftodioikisi Aitolokarnanias and Others*, C-43/10, paragraph 121.

⁸² *Commission v Portugal*, C-239-04, at paragraph 45.

- **Likely outcome:** “it is highly unlikely that the public interest served by delivery of offshore wind proposals will not override the conservation interest (...but there may be exceptional circumstances where the imperative reasons of overriding public interest test cannot be passed)”.

312. In this context it is also relevant and important to note recent developments within the EU. In late November 2022, the European Council agreed a draft Regulation to adopt a EC proposal for a framework to accelerate the permitting and deployment of renewable energy projects throughout the EU⁸³. The draft Regulation is expected to be formally adopted, without substantial amendments, at the next extraordinary energy Council, which is expected to occur by mid-December 2022.

313. The purpose of accelerating the permit-granting process immediately is to support the deployment of technologies that contribute to EU overall energy security and, at the same time, have a low environmental impact. In this context, one of the measures (Article 2) is a new presumption that deployment of renewable energy generating stations (and related grid infrastructure) is generally a matter of overriding public interest:

“planning, construction and operation of plants and installations for the production of energy from renewable sources, and their connection to the grid and the related grid itself and storage assets shall be presumed as being in the overriding public interest and serving public health and safety when balancing legal interests in the individual cases for the purposes of Articles 6(4) and 16(1)(c) of Directive 92/43/EEC [Habitats Directive], Article 4(7) of Directive 2000/60/EC [Water Framework Directive] and Article 9(1)(a) of Directive 2009/147/EC [Birds Directive]”.

314. Recital 8 of the draft Regulation explains that the presumption “...reflects the important role that renewable energy can play in the decarbonisation of the Union’s energy system, in offering immediate solutions to replace fossil-fuel based energy and in addressing the aggravated situation in the market”.

RELEVANT EXAMPLES OF IROPI DECISIONS

315. It is also helpful to examine previous UK OWF projects where the HRA Derogation Provisions have been relied upon. IROPI have been established in the context of five recent decisions to authorise OWFs in the North Sea: Hornsea Three, Norfolk Vanguard, Norfolk Boreas, East Anglia ONE NORTH and East Anglia TWO.

316. Given its location within the North Sea and predicted impacts on similar SPA qualifying species (albeit different SPAs), these five previous OWF derogation cases (see Table 6) are highly relevant to The Proposed Development.

317. In each case, the SofS considered that the public benefit served by the OWF was “*essential and urgent*”⁸⁴. The SofS’s conclusions were predicated upon *‘the principal and essential benefit of the Development as a significant contribution to limiting the extent of climate change in accordance with the objectives of the Climate Change Act 2008. The consequences of not achieving those objectives would be severely deleterious to societies across the globe, including the UK, to human health, to social and economic interests and to the environment.’*

318. In each case, the SofS found that the Government’s “strategy for decarbonisation to achieve this commitment relies on contributions from all sectors delivered through multiple individual projects implemented by the private sector”.

⁸³ Draft Regulation available at: [st15176-en22.pdf \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022R15176-en22.pdf). The legal basis for this new piece of legislation is Article 122 of the Treaty on the Functioning of the European Union, which provides for accelerated legislative procedures in cases of severe supply difficulties for Member States.

⁸⁴ See for example paragraphs 6.34 – 6.42 of the SofS’s decision letter for Hornsea Three.

319. In each case, the SofS accepted that “decarbonisation will lead to a substantially increased demand for electricity as other power sources are at least partially phased out or transformed. Simultaneously the supply of electricity must decarbonise. This will require the establishment of a reliable and secure mix of low-carbon electricity sources, including large-scale development of offshore wind generation”.
320. In each case, the SofS concluded that: “Offshore wind generation schemes can only be developed through the mechanism put in place by The Crown Estate for leasing areas of the seabed in a structured and timely way. Projects, like the Development, which make a significant contribution to meeting the target capacity in the timeframe required are therefore both necessary and urgent”.
321. While the IROPI balancing exercise in each case will turn on its own specific factors, it is established as a matter of principle that the long-term public interests served by the deployment of OWF projects are urgent and imperative and can be overriding in the context of impacts on SPAs in the North Sea.

10.3. CONTENT AND STRUCTURE

322. Drawing on the principles distilled from guidance as set out above, the information to demonstrate IROPI is structured as detailed below:

Step 1	Imperative	Demonstrate the urgency and importance of The Project
Step 2	Public interest	Demonstrate the public interest served by The Project
Step 3	Long-term interest	Demonstrate the long-term nature of the interests that The Project serves
Step 4	Overriding	Demonstrate the public interest weighs in favour of The Project in the context of its impacts individually and collectively on features of the SPAs identified in Table 4.

11. IROPI CASE: STEP 1 – IMPERATIVE REASONS

11.1. INTRODUCTION

323. The imperative reasons that justify The Project are considered in this Section under two headings:

- human health, public safety and beneficial consequences of primary importance to the environment
- socio-economic benefits.

11.2. HEALTH, SAFETY AND BENEFICIAL ENVIRONMENTAL CONSEQUENCES

324. The imperative reasons that justify The Project primarily flow from and are consequent upon the need case summarised in Section 3.1 of this Report, which is predicated upon the critical near-term contribution The Project would make to the key pillars of climate and energy policy and security of energy supply. These are “*reasons relating to human health, public safety or beneficial consequences of primary importance to the environment*” which constitute IROPI.

SECURITY OF ENERGY SUPPLY AND AFFORDABILITY

325. For the reasons set out in Section 3.3 above, reducing our dependency on foreign hydrocarbons is an imperative for security of supply, electricity cost and fuel poverty avoidance reasons.

326. The ECJ confirmed in 2019⁸⁵ that ensuring the security of the electricity supply constitutes an IROPI. The ECJ has held that security of energy supply in the EU is one of the fundamental objectives of EU policy in the field of energy. The ECJ went further, saying that, in any event “*the objective of ensuring the security of electricity supply in a Member State at all times constitutes an imperative reason of overriding public interest, within the meaning of that provision*”⁸⁶ [emphasis added].

327. As noted by the UK government in the BESS the imperative to ensure security of energy supply has been compounded by Russia’s invasion of Ukraine. This has had a direct impact on the affordability of energy in the UK. The BESS describes this on page 5:

“European gas prices soared by more than 200% last year and coal prices increased by more than 100%. This record rise in global energy prices has led to an unavoidable increase in the cost of living in the UK, as we use gas both to generate electricity, and to heat the majority of our 28 million homes.”

328. The urgency for an electricity system which is self-reliant and not reliant on fossil fuels is enormous to protect consumers from high and volatile energy prices, and to reduce opportunities for destructive geopolitical intrusion into national electricity supplies and economics. The energy security and affordability benefits associated with developing electricity supplies which are not dependent on volatile international markets and are located within the UK’s national boundaries are more important than ever.

⁸⁵ Judgement of 29.7.2019 – Case C-411/17 *Inter-Environnement Wallonie and Bond Beter Leefmilieu Vlaanderen*.

⁸⁶ C-411/17 at paragraphs 157 and 159.

329. With the prospect of providing 4.1GW of renewable electricity commencing in large part during the 2020s, there are IROPI justifying The Project on grounds of energy security alone.

CLIMATE CHANGE RISKS

330. As set out in Section 3.1 of this Report above, human-induced global warming has already reached approximately 1°C above pre-industrial levels and the impacts of climate change are global in scope and unprecedented in human existence (IPCC, 2021).
331. Climate change poses a risk to the health and safety of Scottish and UK citizens. The gravity of this risk has been made plain in recent reports by the IPCC and UK CCC. The IPCC's AR6 Report underscores the gravity of the risk to the environment and consequently to humans and all life.
332. AR6 Report (part 1)⁸⁷ provided new estimates of the chances of crossing the global warming level at 1.5°C in the next decade. It concludes that, without immediate, rapid, and large-scale reductions in GHG, limiting warming close to 1.5°C or even 2°C will be beyond reach. The UN Secretary General described the AR6 Report as a "*Code Red for humanity*".
333. AR6 Report (part 2)⁸⁸ was accompanied by a press release which described a narrowing window for action to address the threat to human wellbeing:
- "The scientific evidence is unequivocal: climate change is a threat to human wellbeing and the health of the planet. Any further delay in concerted global action will miss a brief and rapidly closing window to secure a liveable future."*
334. AR6 Report (part 3)⁸⁹ confirms the harmful and permanent consequences of failing to limit the rise of global temperatures. The press release highlights that the "*next two years are critical*" (page 1) and that, limiting warming to around 1.5°C, would require "*global greenhouse gas emissions to peak before 2025 at the latest, and be reduced by 43% by 2030*" (page 2)
335. The key message from the AR6 Report is that humanity is not on track to limit warming and action to ensure deep reductions in CO2 and other GHG emissions must occur this decade and next.
336. Action to address climate change is an imperative because the consequences of climate change include extreme weather events (flooding, heat waves and droughts), species extinctions and ecosystems collapse. These all threaten the health, safety, and environment of citizens in Scotland and the UK, for example by hindering food production, water resources and putting lives and settlements at risk. The climate stability that has enabled humans to prosper is now at risk.
337. The most recent UK climate change risk assessment published by the UK's CCC Third Climate Change Risk Assessment, highlights 61 risks and opportunities resulting from climate change, as summarised in Table 17. The Project will contribute to tackling the climate change risks identified.
338. As can be seen from Table 17, the risk is not only to humans. There has been a significant long-term warming trend (by around 2°C) in the North Sea over the past century, which is significantly faster than the rate of warming of global oceans (Cefas, 2020). Our understanding of the effects of warming on the physical processes and ecology of the North Sea continues to advance.

⁸⁷ Published on 9th August 2021

⁸⁸ Published on 28th February 2022

⁸⁹ Published on 04 April 2022.

Table 17 Risks identified in the CCRA3 Technical Report (CCC, 2021)

Risk number	Description
Natural Environment and Assets	
N1	Risks to terrestrial species and habitats from changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion).
N4	Risk to soils from changing climatic conditions, including seasonal aridity and wetness.
N5	Risks and opportunities for natural carbon stores, carbon sequestration from changing climatic conditions, including temperature change and water scarcity
N6	Risks to and opportunities for agricultural and forestry productivity from extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion).
N14	Risks to marine species, habitats and fisheries from changing climatic conditions, including ocean acidification and higher water temperatures
Infrastructure	
I2	Risks to infrastructure services from river, surface water and groundwater flooding
I3	Risks to infrastructure services from coastal flooding and erosion
I4	Risks to bridges and pipelines from flooding and erosion
I10	Risks to energy from high and low temperatures, high winds, lightning
I11	Risks to offshore infrastructure from storms and high waves
Health, Communities and the Built Environment	
H1	Risks to health and wellbeing from high temperatures
H3	Risks to people, communities and buildings from flooding
H4	Risks to the viability of coastal communities from sea level rise
B1	Risks to businesses from flooding
B2	Risks to businesses and infrastructure from coastal change from erosion, flooding and extreme weather events
B3	Risks to business from water scarcity

339. Although Scotland and the wider UK are leading decarbonisation efforts around the world, as described in section 3 of this Report above, their respective legal commitments of achieving Net Zero by 2045 and 2050 respectively are not yet assured.
340. For the reasons set out in Section 3 of this Report, a massive increase in energy generation from offshore wind is important to reduce electricity-related emissions and provide a timely next-step contribution this decade to a future generation portfolio which can support the massive increase in electricity demand.
341. As noted earlier, in previous OWF decisions, the SofS has recognised that the consequences of not taking action to seek to limit the extent of climate change would be *"severely deleterious to societies across the globe, to human health, to social and economic interests and to the environment"*.
342. The Project is aligned with and serves to implement fundamental Government policy and state aims and would make a very substantial contribution to meeting the target capacity in the timeframe required (i.e. by 2030). It follows that The Project is both necessary and urgent and is justified by IROPI based on delivery of beneficial consequences of primary importance to the environment, and for human health and public safety.

11.3. SOCIO-ECONOMIC BENEFITS

INTRODUCTION

343. It is clear from the various policy documents addressed in the Applicant's Statement of Need and Offshore Planning Statement that the Scottish Government plans to deliver on its Net Zero commitment by 2045 in a way that maximises the opportunities for Scottish industry to ensure a fair and just transition to clean energy.
344. The socio-economic impact of the Project is set out in Chapter 18 of the EIA Report (Volume 1), which refers to an economic impact study carried out by independent renewable energy consultants, BVG Associates (BVGA). It is also referenced in the Applicant's Planning Statement. The following therefore provides a summary of the key findings.
345. The study carried out by independent renewable energy consultants, BVG Associates (BVGA), has shown that at peak construction in 2026 the Project could create around 4,650 direct, indirect and induced jobs in Scotland, and 9,300 in the UK – adding an estimated £8.3 billion to the UK economy as a whole over the life-time of the Project.
346. The Project is capable of providing substantial socio-economic benefits to the Scottish economy including facilitating confidence in the Scotland supply chain, growing a skilled workforce, improving Gross Value Added (GVA) and providing wider community benefits. A summary is set out below.

EMPLOYMENT

347. During manufacturing, construction, and installation activities, the assessment estimates that the Project would support around 4,800 jobs per annum and 6,000 total Full Time Employment (FTE) in Scotland under the Baseline UK Supply scenario (refer to Table 18.33 of the Offshore EIA Report, Volume 2, Chapter 18).
348. During development, manufacturing, construction, and installation activities, the Project will inevitably draw some of its labour from outside of a number of local economic development study areas. However, within the local study areas referenced in the assessment for this phase of development (Invergordon, Aberdeen, Dundee, and Leith), the potential employment is estimated to be approximately 1,100 total FTE years (direct employment) under the Baseline UK Supply scenario (refer to Table 18.33 of the Offshore EIA Report, Volume 2, Chapter 18).
349. In conclusion, there will be a material positive benefit for the offshore wind sector, with significant beneficial impacts on employment generally but especially during the construction phase.

INVESTMENT (GVA)

350. During manufacturing, construction, and installation activities, the SIA sets out that the Project has the potential to generate £360 million (maximum concurrent GVA) GVA per annum and £450 million in total GVA, at the Scotland national level. This is equivalent to 80% of the 2019 offshore wind sector GVA in Scotland (refer to Table 18.45 and 18.46 of the Offshore EIA Report, Volume 2, Chapter 18).
351. For the local study areas (Invergordon, Aberdeen, Dundee and Leith), this impact is £90 million GVA per annum and £90 million in total GVA (refer to Table 18.45 of the Offshore EIA Report, Volume 2, Chapter 18).
352. During operation and maintenance activities, the Project has the potential to generate between £76 million GVA per annum and £2,600 million in total over the whole operation and maintenance period at the Scotland national level (refer to Table 18.51 in the Offshore SIA – Chapter 18). This is equivalent to 16.9% of the 2019 offshore wind sector GVA in Scotland (refer to Table 18.52 of the Offshore EIA Report, Volume 2, Chapter 18).

353. For the local study areas (Aberdeen, Montrose, Dundee, Methil, Burntisland, Rosyth, Leith and support harbours), this impact is £34 million GVA per annum and £1,200 million in total (refer to Table 18.51 of the Offshore EIA Report, Volume 2, Chapter 18).

SUPPLY CHAIN CAPACITY, CAPABILITY AND SKILLS DEVELOPMENT

354. The socio- economics and tourism local study area for the Project (Invergordon, Aberdeen, Montrose, Dundee, Methil, Burntisland, Rosyth, Leith and support harbours east of Leith) has benefitted significantly and will continue to benefit from three of SSER's offshore wind farms: Seagreen 1 (under construction), Seagreen 1a (in development) both in the former Firth of Forth Zone; Beatrice (fully operation) in northeast Scotland.
355. SSER has an established presence in the Firth of Forth. The Project will benefit from Seagreen 1 (1,000 MW) within the former Firth of Forth Zone, the largest and deepest offshore wind farm in Scottish waters, developed by SSER in partnership with Total. SSER and Total have addressed the challenges of deploying offshore wind in deep waters and established a long-term supply chain and material employment prospects to the Scottish job market, including 400 Scottish construction jobs and 60 during operation and maintenance.
356. The SIA explains that the north Scotland local study area for The Project already benefits from SSER's substantial development of Beatrice Offshore Wind Farm (588 MW), Scotland's largest-ever private sector infrastructure investment at time of construction. This has contributed significant expenditure in Scotland including £10m on development and construction, £1.4bn on operational lifetime spend and has created 370 jobs. Of primary benefit to The Project is SSER's investment of £20m for the renovation of Wick Harbour, as well as the Open4Business portal where local suppliers can register for contractual opportunities.
357. By seeking to maximise the capacity at The Project, it brings forward the important opportunity and potential for supply chain investment in Scotland to meet Scottish policy by supporting an expanding domestic market in Scotland-based support services in readiness for both ScotWind and international project support.
358. The Project will support the continued development of the Scotland and the wider UK's offshore wind clusters, particularly those located near the development, through engagement with local business networks in order to increase supply chain participation. In addition to job generation and investment, The Project will also support the development of skills which the offshore wind industry needs to flourish. Building up to 4.1 GW of offshore wind capacity by 2030 in Scotland will support a significant number of skilled jobs.
359. The Applicant will develop an Outline Employment and Skills Plan which will include the plans to enhance the benefits available to the local and national economies. The Applicant will promote the opportunities for local economic benefit associated with The Project through promoting opportunities:
- for the involvement of local companies in the construction and operation supply chain (this will also be addressed in detail at local, regional and national level in the Supply Chain Plan (SCP) which is a requirement of the CfD process); and
 - for local residents to access employment opportunities associated with the construction and operation of the wind farm.

11.4. CONCLUSIONS

360. With the potential to generate an estimated 4.1 GW, the Project will deliver a substantially sized single project with near-term contribution to national decarbonisation and energy security of supply objectives, whilst also delivering substantial socio-economic benefits.
361. In the previous OWF Decisions, the SofS has determined that the consequences of not contributing to the objective of limiting the extent of climate change would be "severely

deleterious to societies across the globe, to human health, to social and economic interests and to the environment" (e.g. BEIS, 2020a: para 6.37). That conclusion applies equally in the context of The Project. Rapid decarbonisation of the energy sector not only provides beneficial consequences for the environment, it is essential for human health and public safety reasons.

362. Furthermore, as the ECJ has held⁹⁰, the security of the electricity supply constitutes an IROPI "at all times", a position recently underlined by the proposed Council Regulation to introduce a presumption that renewable energy projects are "*of overriding public interest and serving public health and safety*"⁹¹.
363. The imperative nature of the reasons applicable in this case flow from their urgency as well as their importance. The energy security of supply crises necessitates urgent action this decade. Similarly, the 2030 global ambition gap in relation to climate change mitigation will be closed only by bringing forward projects such as The Project which connect as much capacity as possible to as early as possible.
364. The imperative reasons to urgently deliver the Project are thus clear and demonstrable. The requirement to deliver significant volumes of renewable energy generating capacity is important not only to meet Scotland's legally binding Net Zero commitment by 2045 and the UK's by 2050, in response to the latest climate science but also to address the energy security of supply crisis which also constitutes a threat to human health and public safety. In turn, the size of the contribution expected from offshore wind by 2030, up to 11 GW in Scotland and 50 GW in the UK, demonstrates the scale and urgency of the task in hand.
365. In conclusion, The Project is justified for imperative reasons relating to human health, public safety and beneficial consequences of primary importance to the environment, and additionally by delivery of important socio-economic benefits in the form of investment and supply chain opportunities during the 2020s.

⁹⁰ Judgement of 29.7.2019 – Case C-411/17 *Inter-Environnement Wallonie and Bond Beter Leefmilieu Vlaanderen*.

⁹¹ See Recital seven. [st15176-en22.pdf \(europa.eu\)](#).

12. IROPI CASE: STEP 2 - CLEAR PUBLIC INTEREST

12.1. FACILITATING ACHIEVEMENT OF FUNDAMENTAL STATE AIMS

366. The Applicant is a private entity but there is a clear public interest served by The Project.
367. The drivers for offshore wind in general and for The Project specifically clearly stem from a suite of national and international law and policy (see Section 3 of this Report above) designed to serve fundamental public interests in dealing with the challenges and risks identified and summarised at IROPI Step 1 above. Those public interests, in short, are:
 - Rapid decarbonisation to mitigate climate change
 - Ensuring security of energy supply at affordable cost
368. The strategy to harness Scotland's and the UK's offshore wind resource to produce renewable electricity can only be delivered through the private sector. All five previous OWF derogation decisions acknowledge this essential reality.
369. Offshore wind is an important technology for low-carbon generation and the urgent need for large additional capacities of low-carbon generation to come on-stream is clear. The identification and development of offshore sites and the Round 3 Zones (including The Project) for that purpose is a fundamental national policy pursued within a clear framework, which seeks to protect the environment and human health from the consequences of energy supply shortages and climate change and promote public safety.
370. As concluded earlier, without The Project, it is probable that delivery of multitude policies will fall short, including: the BESS, the Scottish Offshore Wind Policy Statement, the Sectoral Marine Plan for Offshore Wind, Scottish Energy Strategy, the UK Net Zero Strategy and UK Offshore Wind Sector Deal, as well as the targets set by the Climate Change (Scotland) Act 2009, Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, the (UK) Climate Change Act 2008 (as amended) and the Net Zero Strategy: Build back Greener.
371. The Project can make a large, meaningful and timely contribution to decarbonisation and security of supply, while helping lower bills for consumers throughout its operational life, thereby addressing all important aspects of Scotland and the UK's legal obligations and existing and emerging government policy.
372. The interests that would be served by authorising The Project and therefore of a public nature.

13. IROPI CASE: STEP 3 - LONG-TERM INTEREST

373. The public interests identified through IROPI Steps 1 and 2 above are long-term Scottish and UK interests.
374. The decarbonisation of society including the means of generating energy is a process that has been ongoing for decades and will continue for decades to come. The legal commitments to achieve Net Zero by 2045/2050 respectively are long term. However, Net Zero has to be maintained thereafter. It is not a temporary or fleeting interest, rather the objective is and must be a permanent condition whereby society is in better balance with the environment and is no longer contributing to climate change mechanisms. The transition to renewable energy is also a long-term public interest from an ecological standpoint.
375. Security of domestic energy supply, to ensure that the lights remain on is a continuous long-term obligation of every successive domestic and international Government. Energy supply security is a matter of long-term national interest and security against foreign powers.
376. The Project's contribution to these objectives is itself long-term. It will be capable of providing 4.1GW of clean energy generation for around 35 years (possibly longer). It will contribute to Scotland and the UK's future low carbon energy mix beyond 2045 and beyond 2050.
377. The contribution of The Project is also strategically important, to ensuring continuity in the offshore wind sector. Large energy infrastructure projects have a long lead time and The Project is the only Scottish offshore wind project of significant scale which is proposed to commission between 2025 and 2030⁹². Therefore, The Project can "plug the gap" between Scottish CfD AR3 developments (coming online in the next three years) and ScotWind developments (coming on stream during the 2030s) and provide continuity for the supply chain. This lends greater long-term importance to The Project.
378. Finally, economic benefits through the creation of jobs, work-force upskilling and investment in supply chain are also expected from the construction, operation and maintenance of The Project. Such benefits live on beyond the immediate construction of the Project and can provide a long-lasting legacy (e.g. skilled workers who go on to work on successive OWF projects in the years and decades to come).

⁹² Apart from 0.8GW from a recent ScotWind lease winner, currently hoped to commission in 2029.

14. IROPI CASE: STEP 4 – AN OVERRIDING INTEREST

14.1. A BALANCING EXERCISE

379. The IROPI stage of the HRA process necessarily involves a balancing exercise and the exercise of judgement by the decision maker.
380. It is for the Scottish Ministers in conjunction with the SofS to determine whether the substantial, long-term public interests that The Project serves, outweigh the public interest in the conservation of the qualifying species of the affected SPAs.
381. The Scottish Ministers' and the SofS must exercise that judgement in a rational and a reasonable manner in the context of the HRA framework described in earlier sections of this Report. However, ultimately it is a matter of discretion as to the balance to be struck.

14.2. THE RELEVANT CONSERVATION INTERESTS

382. The Applicant's most precautionary assessment of the RIAA has concluded AEOI in respect of the following SPAs because of predicted levels of adult mortality of the following qualifying species:
- Forth Islands (kittiwake, guillemot, razorbill and puffin)
 - St Abbs Head to Fast Castle (kittiwake, guillemot and razorbill)
 - Fowlsheugh (kittiwake, guillemot and razorbill)
 - Farne Islands (kittiwake)
 - East Caithness Cliffs (kittiwake and razorbill)
 - Troup, Pennan & Lion's Head (kittiwake)
 - Buchan Ness to Collieston Coast (kittiwake)
 - Flamborough and Filey Coast SPA (kittiwake)
383. The impacts which result in the Applicant's conclusion of AEOI are summarised in section 1.6 above. Further background information on the affected SPAs including the reasons for their designation, population size and conservation status can be found in the RIAA.

14.3. THE OVERRIDING FACTORS

384. The Applicant is confident that the long-term public interests served by The Project override the AEOI identified in respect of the above SPAs (individually and cumulatively) for the reasons set out in this Part C.
385. The qualifying interests affected in this case are not priority habitats or species, to which the Habitats Regulations attach especial importance. While the impacts are at levels which it is concluded give rise to AEOI, compensatory measures are proposed which would secure the overall coherence of the national site network.
386. On the other side of the balance, The Project is necessitated by long-term public interests of the highest priority: **decarbonisation and security of affordable energy supplies**.
387. Both fall within the core IROPI category which is "*reasons relating to human health, public safety or beneficial consequences of primary importance to the environment*", being reasons which the Habitats Regulations mandate can be overriding even in circumstances where AEOI has been found in respect of priority habitats and/or species. Decarbonisation is imperative in order to protect human health and public safety, as well as to deliver beneficial consequences of primary importance to the environment, for all the reasons set

out in the preceding sections. The ECJ affirmed in 2019⁹³ that ensuring the security of the electricity supply “at all times” constitutes an IROPI. Either reason, then, even in isolation, can and would constitute IROPI. Together, the case is beyond doubt.

388. On this point, it is noted that the recent DTA guidance (draft, 2021a) suggests that, in general, the interests served by OWF development are likely to outweigh and override the conservation interests:

“Given the urgency of the climate change crisis, and having demonstrated the absence of alternative solutions, Scottish Ministers anticipate that it is highly unlikely that the public interest served by delivery of offshore wind proposals will not override the conservation interests.”

389. This advice is also consistent with the conclusions reached by the SofS in each of the five previous UK OWF decisions which relied upon the HRA Derogation Provisions.

390. In conclusion, The Project is a project of national strategic and overriding importance for reasons set out at length above but which can be distilled as follows:

- Delivery of up to 4.1GW of low-carbon electricity – enough to power more than 5 million homes each year, starting from 2026.
- A substantial near-term contribution to decarbonisation, offsetting millions of tonnes of CO2 emissions per annum from 2026.
- More than 4.1GW of OWF capacity is required in Scotland and the wider UK to meet policy aims and legal targets for 2030. Without The Project, the 2030 targets would not be met.
- If developed at its full technically achievable capacity, The Project would provide enough energy to replace 19% of Russian gas imports to the UK.
- Decarbonisation and energy security are both urgent imperatives. The scale of and timelines associated with The Project align with that urgency.
- The Project is the only Scottish offshore wind project of significant scale proposed to commission between 2025 and 2030. The Project can “plug the gap” between Scottish CfD AR3 OWFs and ScotWind (likely to start to come on stream from the 2030s onwards).
- Development of The Project is advanced and there is a high degree of certainty attached to its deliverability and cost efficiency for many reasons including location (shallow waters), design (fixed bottom turbines) and large scale (4.1GW).
- The Project enacts, to a large measure owing to its scale, Scottish and UK energy, climate change, planning and marine planning policies, serving the long-term public interests (as set out at a) – g) above. Without The Project, it is probable that delivery of multitude policies will fall short, including: the Scotland Sectoral Marine Plan, Scottish Energy Strategy, the Ten Point Plan, UK Net Zero Strategy and UK Offshore Wind Sector Deal, as well as the targets set by the Climate Change (Scotland) Act 2009, Climate Change (Emissions Reduction Targets) (Scotland) Act 2019, the (UK) Climate Change Act 2008 (as amended) and the Net Zero Strategy: Build back Greener.

391. For all these reasons, The Project is an essential part of the future generation mix.

392. **The long-term public interests that The Project serves therefore demonstrably outweigh the predicted harm to each and all affected SPAs which are the subject of this Derogation Case.**

⁹³ Judgement of 29.7.2019 – Case C-411/17 *Inter-Environnement Wallonie and Bond Beter Leefmilieu Vlaanderen*.

15. SUMMARY OF PART C: IROPI

- 393. The Project would contribute substantially to Scotland's and the UK's legally binding climate change targets, providing a significant near-term contribution to decarbonisation of energy supply, whilst also contributing to the essential tasks of ensuring security of supply and providing low-cost energy for consumers in line with the Scotland and UK Government's national policies.
- 394. These are reasons which fall within the core IROPI category of human health, public safety or benefits of primary importance of the environment.
- 395. There is an overriding public interest in authorising The Project to further the fundamental policy objectives it will serve, which demonstrably outweighs the AEOI which is predicted in respect of the identified SPAs.
- 396. The Project will also contribute materially to the economic and social landscape in Scotland and the UK and can provide substantial employment opportunities and skills development, particularly in coastal communities, whilst also playing a major role in supporting Scotland and the UK's supply chains.
- 397. This Report demonstrates a compelling case that The Project is indispensable and must be carried out for IROPI.

PART D: COMPENSATORY MEASURES

16. INTRODUCTION TO COMPENSATORY MEASURES

16.1. OVERVIEW

398. Having demonstrated in Parts B and C, that there are no Alternative Solutions and that there are IROPI for the Proposed Development, Part D now demonstrates to the Scottish Ministers that compensatory measures can be put in place if necessary to ensure the overall coherence of the national site network. This is presented should the Scottish Ministers adopt the most precautionary assessment conclusions of the RIAA and conclude AEOI in respect of the Forth Islands, St Abbs Head to Fast Castle, Fowlsheugh, Farne Islands, Flamborough and Filey Coast, East Caithness Cliffs, Buchan Ness to Collieston Coast and Troup, Pennan and Lion's Heads SPAs, as outlined in Table 4.

16.2. CONTENT AND STRUCTURE

399. This section provides a summary of the process that the Applicant has carried out to select a suite of compensatory measures. This section also provides a summary of each proposed compensatory measure, an assessment of feasibility and a justification of the sufficiency of each measure. Further details on the measures are available in the Colony Compensation Measures (CCM) Evidence Report, Fisheries Compensation Measures (FCM) Evidence Report and Implementation and Monitoring Plan (IMP) which have been submitted alongside this document.

16.3. CONSULTATION

400. The Applicant has undertaken extensive consultation about compensation for the Proposed Development with relevant stakeholders as part of the preparation of the Derogation Case. Detail on this consultation is presented in the Consultation Log (Appendix 1 of this document) and is referred to in the relevant sections below. Consultation with various stakeholders about the proposed compensatory measures will continue post consent.

17. COMPENSATORY MEASURES SELECTION PROCESS

401. The Applicant has used a five-step process to select the proposed compensatory measures. This is set out below.

- Step 1 - Risk to conservation objectives
 - Quantify the nature and extent of potential adverse effects and the conservation objectives which may be undermined
 - Show how these effects might affect overall network coherence,
- Step 2 – Aims and Objectives
 - Specify the aims and objectives of compensatory measures
- Step 3 - Feasibility of potential compensatory measure options

- Assessing the feasibility of potential compensatory measure options (technical, legal and financial)
 - Identify a final list of proposed compensatory measures and carry out a detailed feasibility assessment
 - Step 4 - Assess the extent of the proposed compensatory measures and the sufficiency of each measure in ensuring the overall coherence of the National Site Network
 - Step 5 - Implementation and monitoring plan
 - Providing an overarching implementation and monitoring plan
402. This five-step process was undertaken for the Proposed Development and is set out below.

17.2. STEP 1 – QUANTIFYING EFFECTS ON CONSERVATION OBJECTIVES

403. Conclusions from the RIAA drawn from the Scoping Approach have been used in this section to quantify the effect on the conservation objectives of SPAs adversely affected. As discussed in section 1.6, this worst-case approach is considered by the Applicant to be over-precautionary, but it is presented here to allow Scottish Ministers to consider all the potential requirements for compensation and, therefore, all measures put forward as options.
404. Table 18 presents the predicted annual adult mortality of all SPA features that the RIAA, using the Scoping Approach, found an AEOL. The mortalities for kittiwake represent a combined impact value for collision and displacement. The mortalities for all other species are a result of displacement only. As stated in section 1.6 for the majority of features a conclusion of AEOL is due to the in-combination effect of other plans and projects. Only for two features at three SPAs was an AEOL identified from the Proposed Development alone (guillemot at Forth Islands, Fowlsheugh and St Abb's Head to Fast Castle, and kittiwake at St Abb's Head to Fast Castle).
405. This table demonstrates that the combined impacts of displacement and collision from the Proposed Development may negatively impact the conservation objectives of Forth Islands SPA, St Abbs Head to Fast Castle SPA, Fowlsheugh SPA, East Caithness Cliffs SPA, Buchan Ness to Collieston Coast and Troup SPA, and Pennan and Lion's Heads SPA by increasing adult mortality. This means that the population of the impacted species may no longer form a viable component of the site in the long term.
406. For the Farne Islands and the Flamborough and Filey Coast SPAs the combined impacts of displacement and collision from the proposed development may negatively impact the conservation objectives by increasing adult mortality. This means that the capacity of the population to be maintained or restored may be compromised. This potential reduction in population at the impacted sites means that the National Site Network may not be able to sustain a viable population and therefore overall network coherence may be compromised.

Table 18: The predicted annual adult mortality from the Proposed Development for SPA qualifying features adversely affected. Mortalities are calculated using the Scoping Approach. Relevant Conservation Objectives affected also provided.

Species	SPA	Adult Mortality (Scoping Approach)	Conservation objectives affected
Kittiwake	Buchan Ness to Collieston Coast	21.0	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	East Caithness cliffs	41.1	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	Farne Islands	35.2	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring: The population of each of the qualifying features
	Flamborough and Filey Coast	38.2	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring: The population of each of the qualifying features
	Forth Islands	43.3	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	Fowlsheugh	130.5	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	St Abb's Head to Fast Castle	371.3	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	Troup, Pennan and Lion's Heads	18.4	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	TOTAL	699	
Guillemot	Forth Islands	180.5	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	Fowlsheugh	473.3	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	St Abb's Head to Fast Castle	576.1	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site

Species	SPA	Adult Mortality (Scoping Approach)	Conservation objectives affected
TOTAL		1229.9	
Razorbill	East Caithness cliffs	14.8	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	Forth Islands	19.0	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	Fowlsheugh	23.0	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	St Abb's Head to Fast Castle	14.4	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
TOTAL		71.2	
Puffin	Forth Islands	30.2	To ensure for the qualifying species that the following are maintained in the long term: Population of the species as a viable component of the site
	TOTAL	30.2	

17.3. STEP 2 – THE AIMS/OBJECTIVES OF COMPENSATORY MEASURES

407. The overall **aim** of the compensatory measures is to maintain the coherence of the national site network given the potential impacts of the Proposed Development.
408. The **objective** of the compensatory measures is to offset the impacts on the adult population at the impacted sites that may occur from the proposed development. This can be achieved by implementing measures that reduce mortality, increase recruitment, breeding success, and/or productivity.
409. Therefore, the Applicant put in place a process to identify compensatory measures that would deliver the positive changes to seabird demographics identified above.

17.4. STEP 3 – ASSESSING THE FEASIBILITY OF POTENTIAL COMPENSATORY MEASURE OPTIONS

410. Step 3 provides a summary of the process by which potential compensatory measures were considered and feasible options selected.
411. The chosen suite of compensatory measures was derived, by the Applicant, through a 5-step process (Figure 12). This began with a review of possible impacts and likely SPAs and species for which compensation might be required, followed by a literature review of the pressures upon relevant seabird species, alongside extensive expert stakeholder consultation through structured questionnaire and subsequent discussion to gauge opinion on key limitations for populations and the likely best means of tackling those limitations. Consultation reinforced the need for the planned review of key prey fish and their fisheries.



Figure 12 The five-step evaluation process used to derive a series of potential compensatory measures

412. Initial consultation included all key stakeholders including regulators, statutory conservation bodies and representatives from those organisations with responsibility for particular colonies from the Scottish and English east coast from North Caithness Cliffs (Moray Firth) in the north to Bempton Cliffs (Yorkshire) in the south and encompassing the four ‘focus SPAs’ (Forth Islands, Fowlsheugh, St Abbs to Fast Castle and the Farne Islands) with greatest potential to be most impacted by the Proposed Development. A total of thirteen sites within nine SPAs were represented by the 15 interviewees.
413. Stakeholders were asked to rate the various pressures facing seabirds from high to low. Poor prey availability was the highest ranked pressure on seabirds (*High/Very High*) affecting all species (Table 19). Extreme weather events via climate change including outside the breeding season were considered the next most important (*Medium/High*), especially in relation to some species. Human disturbance and predation typically within the breeding season were only thought to be important for a specific combination of species, colonies and years. Habitat availability was considered to be of *Very Low* importance within all of the SPAs. The importance of a lack of prey relative to available breeding habitat for example was encapsulated by one respondent: [there is] “*plenty of protected cliff nesting habitat for birds to safely starve on. Little or inadequate network of key marine protected areas for birds to forage in.*” Accordingly, there was a striking lack of appetite for compensation focussed on provision of additional nesting habitat (see Table 20).

Table 19: Pressures on key seabird species as rated by stakeholders and expressed as median rank score (from scores from 0–10) where < 2 = Very low, 2–4 = Low, 4–6 = Medium, 6–8 = High, 8–10 = Very High

Pressure	Kittiwake	Puffin	Razorbill	Guillemot
Predation	2.8	2.3	2.3	2.8
Human disturbance	3.5	3.5	2.8	3.0
Poor prey availability	9.5	7.5	7.5	7.5
Competition with other species	3.0	3.0	3.0	4.0
Extreme weather events	6.5	6.0	6.0	7.0
Habitat availability	1.0	1.0	1.0	1.0
Pollution (nets/plastic/chemical)	1.0	1.3	1.0	1.3

Table 20: Efficacy of potential compensation for key seabird species as rated by stakeholders and expressed as median rank score (from scores from 0–10) where < 2 = Very low, 2–4 = Low, 4–6 = Medium, 6–8 = High, 8–10 = Very High

Potential compensation	Kittiwake	Puffin	Razorbill	Guillemot
Predator control (e.g. selective cull, deterrent or diversionary feeding)	3.0	2.0	2.0	3.0
Increased wardening effort to reduce human disturbance	4.0	4.0	4.0	4.0
Habitat management measures (e.g. removal of invasive plants)	0.0	0.0	0.0	0.0
Reduced fishing effort in the vicinity of the colony	8.0	6.0	6.0	6.0
Measures to improve prey (e.g. protection of prey habitats)	8.0	8.0	8.0	8.0
Measures to improve nesting habitat (e.g. boxes/ ledges/towers)	2.0	2.0	1.0	2.0
Removal of marine litter in and around the colony	4.5	4.5	4.5	4.5
Eliminate/reduce seabird bycatch through fisheries regulation	4.5	4.5	4.5	4.5

414. By contrast, compensation focussed on improving prey availability was seen as being of *Very High* value for all species and overwhelmingly important overall (**Table 20**). This was also directed at reducing fishing effort in the vicinity of colonies, potentially both directly for important prey species (e.g. sandeels or clupeids) or to prevent accidental indirect damage

to prey stocks and their habitats through the use of fishing gear directed at other species (e.g. scallop dredging).

415. Following the approach shown in Figure 12, generic options for compensation were then refined into a series of specific compensatory measures that could be applied to the potential impacts of the Proposed Development, on kittiwake, guillemot, razorbill and puffin.
416. The compensatory measures identified were broadly divided into wider **fisheries-based measures** aimed at increasing the prey resource available to seabirds and thence productivity, recruitment and survival, and a suite of **colony-based measures** derived from site-specific issues that focus on reducing mortality, improving breeding success and productivity at a specific colony or series of colonies.
417. The two types of compensatory measure are seen to be complementary. For example, while fisheries-based measures are seen to have the potential for benefits at a population or meta-population scale, they are indirect in nature by operating through prey fish to seabird productivity and survival. Colony-based measures, on the other hand, operate directly on seabird productivity and survival. Colony-based measures also draw directly from the established principles of conservation management (e.g. protection from humans or predators)
418. The importance of different types of measures was seen to vary for different species, with some being more targeted at a particular species. For example, although a reduction of fishing pressure on sandeels (generally lesser sandeel *Ammodytes marinus*) may benefit all species to a greater or lesser extent, this was seen to be most crucial for 'sandeel specialists' such as kittiwake. Control of particular predators was also likely to be species and location-specific, although the removal of rodents, especially rats, from a seabird island may benefit all seabirds through a variety of direct and indirect mechanisms. Nevertheless, the strength of the response may be much higher for some species (e.g. burrow-nesting puffin).
419. The mixture of measures to be developed was thus seen as interactive and broadly synergistic with, for example, a measure to increase prey supply being boosted by a specific colony-based measure providing further protection to chicks benefitting from the quantity and quality of adult provisions, thereby maximising productivity and the prospects and survival. Thus, even small likely 'gains' from a particular measure were seen to be valuable where these contributed to a collective whole. In other words, all potentially beneficial measures were investigated, even if these were not likely to have a 'population-scale' benefit in isolation.
420. The scope for the potential benefit of colony-based measures was also illustrated by the considerable differences of the performance of nearby colonies indicating local limiting factors that, in turn, have potential to be 'managed' at the colony level.

FISHERIES-BASED MEASURES

421. Fish stocks are important for the breeding success and/or survival of seabird populations that forage on these stocks. There have been numerous examples of the benefits of improved fisheries management on fish stocks and consequent benefits to seabird populations. Further detail is provided in the FCM Evidence Report.
422. Many seabirds in the North Sea are known to be dependent on sandeels, particularly in the breeding season. Evidence from the east coast of Scotland and in Shetland has shown that breeding success of many species can be affected by low sandeel abundance. There is also evidence from kittiwakes that adult survival may be reduced if sandeel stocks are sufficiently depleted.
423. Appropriate management of sandeel fisheries in the North Sea was therefore considered to be the **most suitable and sufficient compensation measure for the predicted impact from the Proposed Development on kittiwake, guillemot, razorbill and puffin.**
424. The Applicant has developed two management options for Scottish Ministers to consider:

- Option 1 – Closure of the SA4 Sandeel Fishery: Due to the location of the Proposed Development and the potentially impacted SPA colonies being within or in proximity to SA4 this option proposes an extension of the existing sandeel prohibition zone, to include the whole of SA4. Fishing for sandeels would be prohibited within SA4 aside from an allowance of up to 5000 tonnes for monitoring.
- Option 2 – Ecosystem based management of SA4 Sandeel Fishery: This option would be delivered through the implementation of a SA4 Sandeel Management Plan (SMP) and monitoring of seabirds and sandeels. It provides the opportunity take an adaptive approach to manage fishing pressures by allowing the sandeel stock and increase the overall resilience of the marine ecosystem whilst allowing sustainable fishing to continue.

COLONY-BASED MEASURES

425. A hierarchical approach to evaluation of the colony-based compensation was adopted. The principal focus of compensation was to match the combinations of the likely impacted species and SPA colonies within the Firth of Forth (e.g. compensate for Kittiwake at breeding colonies within Forth Islands SPA). However, where there was little scope to do so, the next preferred option was to undertake compensation at *connected* perhaps non-SPA colonies (e.g. Dunbar) within the Firth of Forth. Where this was not possible or was thought to be insufficient to compensate for potential impacts, compensation outside of the Firth of Forth was sought with the measures benefitting the wider SPA network.
426. Most colony-based measures that originated during consultation stemmed from ideas suggested by stakeholders, especially wardens and researchers associated with colonies. However, further ideas originated from literature review as well as personal experience of colonies and/or conservation management. As such, measures frequently (although not always) focussed and targeted to a species-specific issue at a particular colony. From what was a 'long-list' of 'concept' measures, the more efficacious were selected for further development using a matrix-based approach incorporating a range of criteria including reward, confidence, cost, technical difficulty, efficacy, feasibility and additionality. The question of additionality was generally seen to be satisfied with novel measures or by a measure being over and above the level of management already undertaken.
427. Colony-based measures brought forward for further development were as follows:
- Remove introduced rodents from islands, with the preferred option to carry this out in the Firth of Forth. This could benefit all relevant breeding species (kittiwake, guillemot, razorbill and puffin) but perhaps especially razorbill and puffin breeding in crevices and burrows respectively.
 - Diversionary feeding of peregrine falcon *Falco peregrinus* at St Abbs Head primarily to reduce predation pressure on kittiwake (but also including other species) at the SPA.
 - Funding a warden (and research) to protect and enhance productivity of kittiwake at Dunbar Castle and surrounds as a non-SPA colony.
 - Supplementary feeding of kittiwake nestlings to improve breeding success. This would require a trial with Centre for Ecology and Hydrology on the Isle of May.
 - Control of specialist avian predators including individual/pairs of large gulls or corvids where identified, to potentially benefit kittiwake and any of the auk species.
 - Control of foxes at Longhaven Cliffs (part of Buchan Ness to Collieston Coast SPA) to reduce predation pressure on razorbill, puffin and guillemot.
 - Take steps to reduce human disturbance, primarily at St Abbs Head.
 - Removal of coastal and marine litter, primarily through collaboration with the Forth Estuary Forum and reinvigoration of the Coastal Litter Campaign.
428. During the process of taking forward these measures, several have proven difficult, and others have altered subtly in the light of more detailed consideration of relevant information, further stakeholder engagement, and clarity relating to the mechanisms by which the compensatory measures might be most effectively delivered. Measures that were discounted from further consideration included diversionary feeding of peregrine falcon at St Abbs Head and reducing the impacts of human disturbance at St Abbs Head. In addition to the list above, the possibility of removing rats from Handa Island SPA was raised later in

the process during a follow-up discussion with SWT and was subsequently taken forward. Two further measures were identified and taken forward for further development. These were a reduction in the Gannet harvest at Sula Sgeir and the funding of work to incubate gull eggs removed from buildings by pest control companies

429. The list of the colony-based measures taken forward for discussion with regulators, SNCBs and other stakeholders as a part of the Applicant's seabird compensation consultation process was as follows:
- Remove introduced rodents from islands, both within Firth of Forth and from Handa Island SPA. This could benefit kittiwake, guillemot, razorbill and puffin but most especially razorbill and puffin breeding in crevices and burrows respectively.
 - Funding a warden (and research) to protect and enhance productivity of kittiwake at Dunbar Castle and surrounds as a non-SPA colony.
 - Control of specialist avian predators through diversionary feeding of raptors and large gulls, to potentially benefit kittiwake and any of the auk species.
 - Removal of coastal litter from non-SPA islands in the Firth of Forth to benefit breeding colonies of kittiwake, razorbill, guillemot and puffin.
 - Supplementary feeding of kittiwake and puffin nestlings to improve breeding success. This requires trials to establish benefits and methodology.
 - Cessation of Gannet Harvest at Sula Sgeir
 - Gull Egg rescue and incubation
430. The feedback given in response to these consultation meetings was used to further refine and prioritise the list of measures further.
431. Since compensatory measures must be additional to current management, it is inevitable that focus is directed either towards non-SPA sites where resource for any form of seabird management is either limited or lacking entirely, or towards novel and untried techniques. Since all SPAs have management plans, any obvious issues are identified and plans are put in place to tackle them as a part of the management process, even if resources may be limited. On NatureScot's advice any items listed in a management plan were considered subject to additionality on the basis that there is already an intention and/or plan to tackle them. Although advice from NatureScot stated that compensatory measures should be on a 'like for like basis and/or in close proximity to where the impact will occur, it was difficult to identify measures that could be implemented at SPA colonies since most management plans are effective in identifying problems, even if resourcing to tackle them may be lacking.
432. By contrast additionality was not an issue at non-SPA sites where there is generally no resource for the management of seabirds. Two non-SPA sites were identified in the Firth of Forth that would benefit from funding to better manage their seabird colonies and where stakeholders were open to improving conditions for birds. These were the Kittiwake colony at Dunbar and Inchcolm island, which supports small breeding colonies of Kittiwake, Razorbill and Puffin. Although measures to improve conditions for seabirds at non-SPA colonies were well received during the Applicant's seabird compensation consultation process, the quantity of compensation they might deliver is limited because non-SPAs support much smaller numbers of birds.
433. Feedback from the Applicant's seabird compensation consultation process was most positive in relation to removal of rats from islands. However, for rodent eradication from islands to qualify as compensation the island must have rats and must also support at least some of the key species for which compensation is required. Furthermore, support from the landowner and any other relevant stakeholders is also fundamental. Only one island within the Firth of Forth met these criteria: Inchcolm.
434. Since there was general support for work to eradicate rats from seabird islands it was decided to look for an additional island for rodent removal to generate further compensation. Although Handa had been identified in discussion with SWT during stakeholder consultation, NatureScot questioned whether there might be a more suitable location for compensation nearer the Firth of Forth. A review of islands was conducted to ascertain

whether this may be the case. Although other islands were identified, only Lambay and Handa supported large colonies of the key species and also had a known rat problem. Since Lambay is offshore of Ireland, it was agreed that Handa (being located in closer proximity to the Proposed Development) was the most appropriate compensation location.

435. Prioritisation of other colony-based measures was established through feedback from the Applicant's seabird compensation consultation process, and as a result measures were classified into three Tiers, which are defined below:

- **Tier I:** Measures that are agreed to be beneficial, were generally viewed positively, and which can be implemented within the next year.
- **Tier II:** Measures that are agreed to be beneficial, but which are difficult to quantify, or which require a further data-gathering stage prior to implementation.
- **Tier III:** Measures which were discussed as a part of the consultation process, but which were not progressed due to lack of support from SNCBs and/or regulators, but which may still have the potential to deliver some compensation benefit.

436. It should be noted that **Table 21** only includes compensatory measures relevant to the key species (i.e. those species where there is a potential for an AEOI at SPAs from the Proposed Development).

Table 21: Prioritised colony-based compensatory measures, their location, and the key species which will benefit.

Tier	Measure	Site	Benefits to key species
Tier I	Rat eradication, biosecurity & colony management	Inchcolm	Kittiwake, Razorbill, Puffin
	Rat eradication & biosecurity	Handa	Kittiwake, Guillemot, Razorbill, Puffin
	Wardening and management of non-SPA colony	Dunbar	Kittiwake
Tier II	Forth Islands incursion hub	Forth Islands	Kittiwake, Guillemot, Razorbill, Puffin
	Diversionsary feeding of specialist peregrine falcon nests	Various colonies	Kittiwake, Guillemot, Razorbill, Puffin
Tier III	Diversionsary feeding of other specialist avian predators	Various colonies	Kittiwake, Guillemot, Razorbill, Puffin
	Supplementary feeding of Isle of May - Puffin, Puffin & Kittiwake nests	Dunbar - Kittiwake	Puffin, Kittiwake
	Removal of plastic litter from the Firth of Forth	Forth Estuary Forth Islands	Kittiwake, Guillemot, Razorbill, Puffin
	Fox control	Badbea (East Caithness Cliffs SPA), Longhaven (Buchan Ness to Collieston Coast SPA)	Puffin, Razorbill

437. Following a review of the feasibility of delivery of each measure and in view of the final outcomes of the RIAA, the list of compensatory measures to take forward was refined to three. The final list of measures encompasses a fisheries management measure – for which there are two options for delivery - and two colony measures. These have been taken forward for further consideration within a detailed feasibility assessment.

438. The chosen compensatory measures are:

- **Management of the SA4 sandeel fishery**
 - Option 1: Closure of the SA4 sandeel fishery and monitoring of seabirds and sandeel; or
 - Option 2: Ecosystem-based approach for management of SA4 and monitoring of seabirds and sandeel
- **Rat eradication and biosecurity measures at Handa island**
 - Implementation of an eradication programme, implementation of biosecurity measures, improvements to seabird habitats and monitoring of seabirds.
- **Dunbar Castle wardening role**
 - Implementation of a Kittiwake Management Plan which will detail actions to reduce disturbance, and actions to manage kittiwake habitat as well as monitoring kittiwakes at Dunbar.

DETAILED FEASIBILITY ASSESSMENT OF PROPOSED COMPENSATORY MEASURES

439. The Applicant's detailed feasibility assessment has been carried out to ensure each of the measures selected meets the key criteria for compensation. The list of key criteria was developed in view of the suite of guidance documents available on compensation (see section 2.2). The assessment is presented below in Table 22 to Table 25 and demonstrates to Scottish Ministers that each of the chosen measures is feasible in respect of all criteria assessed.

Table 22 Detailed Feasibility Assessment for Management of SA4 Sandeel Fishery: Option 1 - Closure of the SA4 sandeel fishery and monitoring of seabirds and sandeel

Feasibility Assessment	Y/N/?	Explanation
Is the measure technically feasible?	YES	Closure of the SA4 sandeel fishery is demonstrated to be technically feasible through the existence of other permanent and seasonal closures to fishing methods in several other UK locations. These closures have been successfully implemented to protect certain fish stocks or marine features. Examples include: • Closure of a small area of SA4 since 2000 (as detailed within the FCM Evidence Report) • Suspension of Scallop fishing in UK waters of the North Sea around Dogger Bank • Prohibition of fishing for sea fish within the Firth of Clyde
Is the measure financially feasible?	YES	The IMP sets out the pathway for delivery for the closure of the SA4 sandeel fishery and monitoring of seabirds and sandeel. Under this management option implementation must be delivered by the agencies which sit within the UK Fisheries Administration. The Applicant would facilitate this by providing appropriate resources. Furthermore, the Applicant would undertake all associated monitoring as well as provide sufficient resources to process and analyse data for the operational lifetime of the Proposed Development. Berwick Bank Wind Farm Ltd has sufficient resource to finance these costs. Berwick Bank Wind Farm Ltd is a wholly owned subsidiary of SSE plc SSE plc is rated highly against its peers and is currently rated BBB+ with stable outlook with Standard & Poors and Baa1 with stable outlook with Moody's. As well as the strong credit rating [and the £1.5bn of committed facilities] the SSE Group has also secured circa £1.8bn of debt since April 2024 which proves SSE's ability to fund in difficult market conditions to meet its financial obligations. SSE has a strong track record in securing project finance for the largest Offshore Wind Farm projects including Beatrice, Seagreen 1 and Dogger Bank. This provides confidence that SSE can meet the financial obligations of any necessary compensatory measures.
Is the measure legally feasible?	YES	The IMP describes the principal mechanisms through which both SA4 Management options could be secured. This includes the introduction of regulation of fishing activity and/or an amendment to fishing licence conditions. Selection of the appropriate option in respect of Scottish and English waters would be the decision of the Scottish Ministers and the UK Government respectively, however the Applicant's Implementation Plan makes specific recommendations based on its own legal analysis. In addition, the Applicant has completed an Environmental Impact assessment and a Report to Inform Appropriate Assessment to evidence how this compensatory measure complies with the relevant environmental regulations. These reports conclude that this compensatory measure is not likely to have a significant effect on any of the receptor groups scoped into the EIA, and that

Feasibility Assessment	Y/N/?	Explanation
		the measure will not have an adverse effect on the integrity of any European Site (alone and in-combination with other plans and projects).
Is the measure deliverable?	YES	Delivery would be initiated with a Closure Mechanisms Plan, which would be developed by the Applicant based on the IMP, and in consultation with all relevant stakeholders. This plan would contain all the information on how the proposed closure could be implemented, who would implement it, and the approach to monitoring of this measure, including monitoring of sandeels and seabirds. To demonstrate deliverability the Applicant's IMP has set out an outline delivery programme, including indicative timescales associated with the development of the Closure Mechanisms Plan, and its subsequent implementation.
Is the measure ecologically effective?	YES	The Applicant's FCM Evidence Report reviewed multiple studies that have demonstrated the importance of sandeel stocks for breeding seabirds in the North Sea. The FCM Evidence report also presents evidence which shows that fishing effort negatively affects the sandeel stocks in SA4. It follows that a reduction or removal of sandeel fishing pressure in SA4 has the potential to compensate for the impacts to SPAs adversely affected by the Proposed Development. To test the ecological effectiveness of a reduction or removal of sandeel fishing pressure in SA4 as a compensatory measure, the Applicant has used empirical evidence to assess the relationship between an increase in sandeel Total Stock Biomass (TSB) and seabird adult survival and productivity. Increases in TSB were shown to have a positive effect on demographic parameters. This change was compared against the negative effects of the three predicted impact scenarios. For all species and SPAs adversely affected by the Proposed Development, it was clear that the predicted minimum benefit from a reduction or removal of sandeel fishing pressure in SA4 was ecologically effective and more than sufficient to compensate for all predicted impact scenarios, thus ensuring the overall coherence of the network. The location of the measure means that there will be a significant positive benefit to all the SPAs that are in proximity to SA4. All features adversely affected are known to rely on SA4 for foraging. The exception is the Flamborough and Filey Coast SPA as this site's features forage in sandeel area 1r (SA1r). However, the impacts from the Proposed Development at this SPA are very small, so the benefits from this compensatory measure are likely to be sufficient. This is due to a likely increase in immigration and positive spillover effects of reduced sandeel mortality into SA1r.
Will the measure be effective	YES	Section 6 of the IMP provides a discussion on the timing of the impacts from the Proposed Development alone in the context of the timing of the benefits from this compensatory measure. In summary, the programme set out in the IMP allows for this

Feasibility Assessment	Y/N/?	Explanation
before adverse effects arise?		compensatory measure to be fully operational at the time that any impact occurs. The closure of sandeel fishing in SA4 is expected to immediately benefit all SPA populations in proximity to the Proposed Development through facilitating an increase to seabird adult survival - a demographic parameter for which only very small changes are needed to offset the potential negative effects of the Proposed Development. Furthermore, this compensatory measure is of such a scale that the provision of high levels of compensation is likely to occur very shortly after the measures become fully effective.
Can the measure be secured?	YES	The Section 36 consent for the Proposed Development which will be issued by Scottish Ministers will detail conditions which the Applicant must adhere to, or discharge. It is anticipated that a condition will be included by the Scottish Ministers with regards to securing compensatory measures. A draft condition for this compensatory measure has been provided by the Applicant in section 6.5 of the IMP.
Can success of the measure be monitored?	YES	The IMP describes the Applicant's detailed approach to monitoring this compensatory measure. Monitoring would take place following the implementation of the SA4 closure and would involve monitoring of sandeel stock biomass alongside monitoring of key seabird demographics at the relevant SPAs. The full approach to monitoring will be developed in line with the IMP in consultation with all relevant stakeholders and outlined within the Closure Mechanisms Plan.
How have uncertainties been addressed?	YES	Two key sources of uncertainty were identified in assessment of the effects of this compensatory measure and its ability to address the predicted impacts: the uncertainty around the seabird data and uncertainty around the sandeel data. In addition, the application of correlations between these data sources presents its own uncertainties. A complete account of how these uncertainties and the evidence presented to reduce these uncertainties is provided in section 1.10 of the FCM Evidence Report. Ultimately, any residual uncertainty at the time of implementation would be addressed in two ways: Firstly, the closure of SA4 to sandeel fisheries is expected to achieve compensation ratios much higher than any previously put forward as part of an OWF derogation case. The Applicant's FCM evidence report has demonstrated that the most conservative estimate of benefit compared to the most precautionary impact scenarios would achieve a very large compensation surplus (see Table 26). Secondly, the Applicant has set out its commitments to undertake appropriate monitoring of sandeel stocks and seabird demography at relevant SPAs in the IMP. In the unlikely event that monitoring demonstrates insufficient returns, a suite of adaptive management measures will be implemented. This includes (1) 'built-in' measures i.e. adaptations of this compensatory

Feasibility Assessment	Y/N/?	Explanation
		measure including exploring the potential to limit other fishing methods (such as scallop dredging) that reduce the availability of sandeel prey from seabirds; (2) a range of secondary measures identified within the compensatory measure selection process (section 17.4) but not taken forward as part of this Derogation Case; and (3) participation in strategic compensatory measures being developed by other bodies e.g. Defra and OWIC.
Additionality	YES	Compensation must be additional to the normal practices required for the protection and management of the MPA so that measures should provide additional benefit. This reflects EC guidance which states that, in order to ensure the overall coherence of the network, compensatory measures should be 'additional' to the actions which are normal practice under the Habitats and Birds Directives. As a precautionary measure to safeguard marine top predators, particularly seabirds at internationally important colonies in and around the Firth of Forth, an area off the east coast of Scotland, from Rattray Head to St Abbs, was closed to industrial fishing for sandeels in 2000. This closed area (the 'sandeel box') comprises a small part (roughly 1/3) of the total SA4 area and would be considered an existing practice in terms of protecting and managing relevant SPAs. The remaining 2/3 of SA4 remains open to sandeel fishing. This compensatory measure proposes to develop and implement a sandeel fishing closure in this area as an <u>additional measure</u> to further safeguard and enhance seabird populations at internationally important colonies – some of which are potentially adversely affected by the Proposed Development. At the time of writing, the Applicant is unaware of any other plans/ initiatives to expand the 'sandeel box' or impose any other restrictions/ closures in the remaining sandeel fishery SA4. Therefore, the Applicant's plan would be considered new and additional in this context.

Table 23 Detailed Feasibility Assessment for Management of SA4 Sandeel Fishery: Option 2 - Ecosystem based approach for management of SA4 and monitoring of seabirds and sandeel.

Feasibility Assessment	Y/N/?	Explanation
Is the measure technically feasible?	YES	An Ecosystem based approach for management of a sea area for sandeel has been demonstrated to be technically feasible by the Norwegian Spatial Management Plan in SA3 – the neighbouring sandeel management area to the east of SA4. More information on the Norwegian Spatial Management Plan has been provided in Section 2.2 of the IMP.
Is the measure financially feasible?	YES	The IMP sets out the pathway for delivery of an ecosystem-based approach to management of SA4 and monitoring of seabirds and sandeel. Under this management option implementation must be delivered by the agencies that sit within the UK Fisheries Administration. The Applicant would facilitate this by providing appropriate resources. Furthermore, the Applicant would undertake all associated monitoring as well as provide sufficient resources to process and analyse data for the operational lifetime of the Proposed Development. Berwick Bank Wind Farm Ltd has sufficient resource to finance these costs. Berwick Bank Wind Farm Ltd is a wholly owned subsidiary of SSE plc SSE plc is rated highly against its peers and is currently rated BBB+ with stable outlook with Standard & Poors and Baa1 with stable outlook with Moody's. As well as the strong credit rating [and the £1.5bn of committed facilities] the SSE Group has also secured circa £1.8bn of debt since April 2024 which proves SSE's ability to fund in difficult market conditions to meet its financial obligations. SSE has a strong track record in securing project finance for the largest Offshore Wind Farm projects including Beatrice, Seagreen 1 and Dogger Bank. This provides confidence that SSE can meet the financial obligations of any necessary compensatory measures.
Is the measure legally feasible?	YES	The IMP describes the principal mechanisms by which this SA4 management option could be secured. Options include the introduction of regulation of fishing activity and/or an amendment to fishing licence conditions. Selection of the appropriate option in respect of Scottish and English waters would be the decision of the Scottish Ministers and the UK Government respectively, however the Applicant's Implementation Plan makes specific recommendations based on its own legal analysis. In addition, the Applicant has completed an Environmental Impact assessment and a Report to Inform Appropriate Assessment to evidence how this compensatory measure complies with the relevant environmental regulations. These reports conclude that this compensatory measure is not likely to have a significant effect on any of the receptor groups scoped into the EIA, and that the measure will not have an adverse effect on the integrity of any European Site (alone and in-combination with other plans and projects).

Feasibility Assessment	Y/N/?	Explanation
Is the measure deliverable?	YES	Delivery would be initiated with a SA4 Sandeel Management Plan (SMP), which would be developed by the Applicant based on the IMP, and in consultation with all relevant stakeholders. This plan would contain all the information on how this ecosystem-based management approach could be implemented, who would implement it, the approach to monitoring (including monitoring of sandeel and seabirds) and the trigger points for adaptive measures. To demonstrate deliverability the Applicant's IMP has set out an outline delivery programme, including indicative timescales associated with the development of the SA4 SMP, and its subsequent implementation.
Is the measure ecologically effective	YES	The Applicant's FCM Evidence Report describes multiple studies that have demonstrated the importance of sandeel stocks for breeding seabirds in the North Sea. The FCM Evidence report also presents evidence which shows that sandeel fishing effort negatively affects the sandeel stocks in SA4. It follows that a reduction or removal of sandeel fishing pressure in SA4 has the potential to compensate for the impacts to SPAs adversely affected by the Proposed Development. To test the ecological effectiveness of a reduction or removal of sandeel fishing pressure in SA4 as a compensatory measure, the Applicant has used empirical evidence to assess the relationship between an increase in sandeel Total Stock Biomass (TSB) and seabird adult survival and productivity. Increases in TSB were shown to have a positive effect on demographic parameters. This change was compared against the negative effects of the three predicted impact scenarios. For all species and SPAs adversely effected by the Proposed Development, it was clear that the predicted minimum benefit from a reduction or removal of sandeel fishing pressure in SA4 was ecologically effective and more than sufficient to compensate for all predicted impact scenarios, thus ensuring the overall coherence of the network. An ecosystem approach to management of SA4 would monitor this benefit on an annual basis in order to manage the adjustment of fishing pressure to an appropriate level. The location of the measure means that there will be a significant positive benefit to all the SPAs that are in proximity to SA4. All features adversely affected are known to rely on SA4 for foraging. The exception is the Flamborough and Filey Coast SPA as this site's features forage in sandeel area 1r (SA1r). However, the impacts from the Proposed Development at this SPA are very small, so the benefits from this compensatory measure are likely to be sufficient. This is due to a likely increase in immigration and positive spillover effects of reduced sandeel mortality into SA1r.
Will the measure be effective before	YES	Section 6 of the IMP provides a discussion on the timing of the impacts from the Proposed Development alone in the context of the timing of the benefits from this compensatory measure. In summary, the programme set out in the IMP allows for this compensatory measure to be fully operational at the time that any impact occurs. The first step of the implementation phase

Feasibility Assessment	Y/N/?	Explanation
adverse effects arise?		would be to fully close sandeel fishing in SA4 prior to the implementation of the ecosystem based approach. This initial step, is expected to immediately benefit all SPA populations in proximity to the Proposed Development though facilitating an increase to seabird adult survival - a demographic parameter for which only very small changes are needed to offset the potential negative effects of the Proposed Development. Furthermore, this compensatory measure is of such a scale that the provision of high levels of compensation is likely to occur very shortly after the measures become fully effective.
Can be measure be secured?	YES	The Section 36 consent for the Proposed Development which, licences will be issued by Scottish Ministers will detail conditions which the Applicant must adhere to, or discharge. It is anticipated that a condition will be included by the Scottish Ministers with regards to securing compensatory measures. A draft condition for this compensatory measure has been provided by the Applicant in section 6.5 of the IMP.
Can success of the measure be monitored?	YES	The IMP describes the Applicant's detailed approach to monitoring of this compensatory measure. Monitoring would take place following the implementation of the SA4 closure and would involve monitoring of sandeel stock biomass alongside monitoring of key seabird demographics at the relevant SPAs. This monitoring is integral to the adaptive nature of this compensatory measure as the results will be used to manage sandeel fishing pressure to an appropriate level. The full approach to monitoring will be developed in line with the IMP in consultation with all relevant stakeholders, and outlined within the SA4 SMP.
How uncertainties have been addressed?	YES	Two key sources of uncertainty were identified in assessment of the effects of this compensatory measures and its ability to address the predicted impacts: the uncertainty around the seabird data and uncertainty around the sandeel data. In addition, the application of correlations between these data sources presents its own uncertainties. A complete account of how these uncertainties and the evidence presented to reduce these uncertainties is provided in section 1.10 of the FCM Evidence Report. Ultimately, any residual uncertainty at the time of implementation would be addressed in three ways: Firstly, the closure of SA4 to sandeel fisheries is expected to achieve compensation ratios much higher than any previously put forward as part of an OWF derogation case. The Applicant's FCM evidence report has demonstrated that the most conservative estimate of benefit compared to the most precautionary impact scenarios would achieve a very large compensation surplus (see Table 26).

Feasibility Assessment	Y/N/?	Explanation
		Secondly, the Applicant has set out its commitments to undertake appropriate monitoring of sandeel stocks and seabird demography at relevant SPAs in the IMP in order to take an ecosystem based approach to fisheries. Under this approach monitoring results will be assessed annually in order to adjust sandeel fishing management to an appropriate level. Finally, in the unlikely event that an ecosystem approach to management provides insufficient returns, a suite of other adaptive management measures will be implemented. This includes (1) 'built-in' measures i.e. adaptations of this compensatory measure including exploring the potential to limit other fishing methods (such as scallop dredging) that reduce the availability of sandeel prey for seabirds; (2) a range of secondary measures identified within the compensatory measure selection process (section 17.4) but not taken forward as part of this Derogation Case; and (3) participation in strategic compensatory measures being developed by other bodies e.g. Defra and OWIC.
Is the measure additional?	YES	Compensation must be additional to the normal practices required for the protection and management of the MPA so that measures should provide additional benefit. This reflects EC guidance which states that, in order to ensure the overall coherence of the network, compensatory measures should be 'additional' to the actions which are normal practice under the Habitats and Birds Directives. As a precautionary measure to safeguard marine top predators, particularly seabirds at internationally important colonies in and around the Firth of Forth, an area off the east coast of Scotland, from Rattray Head to St Abbs, was closed to industrial fishing for sandeels in 2000. This closed area (the 'sandeel box') comprises a small part (roughly 1/3) of the total SA4 area and would be considered an existing practice in terms of protecting and managing relevant SPAs. The remaining 2/3 of SA4 remains open to sandeel fishing. This compensatory measure proposes to develop and implement ecosystem-based approach management of this area as an <u>additional measure</u> to further safeguard and enhance seabird populations at internationally important colonies – some of which are potentially adversely affected by the Proposed Development. At the time of writing, the Applicant is unaware of any other plans/ initiatives to expand the 'sandeel box' or impose any other restrictions/ closures in the remaining sandeel fishery SA4. Therefore, the Applicant's plan would be considered new and additional in this context.

Table 24 Detailed Feasibility Assessment for rat eradication and biosecurity measures at Handa Island

Feasibility Assessment	Y/N/?	Explanation
Is the measure technically feasible?	YES	This compensatory measure has previously been demonstrated to be technically feasible on Handa as other rat eradication campaigns have previously been implemented on the island.
Is the measure financially feasible?	YES	The Applicant is committed to fund this compensatory measure. Berwick Bank Wind Farm Ltd has sufficient resource to finance these costs. Berwick Bank Wind Farm Ltd is a wholly owned subsidiary of SSE plc SSE plc is rated highly against its peers and is currently rated BBB+ with stable outlook with Standard & Poors and Baa1 with stable outlook with Moody's. As well as the strong credit rating [and the £1.5bn of committed facilities] the SSE Group has also secured circa £1.8bn of debt since April 2024 which proves SSE's ability to fund in difficult market conditions to meet its financial obligations. SSE has a strong track record in securing project finance for the largest Offshore Wind Farm projects including Beatrice, Seagreen 1 and Dogger Bank. This provides confidence that SSE can meet the financial obligations of any necessary compensatory measures
Is the measure legally feasible?	YES	The Applicant has committed to producing an Operational Plan as one of several implementing mechanisms for this compensatory measure. As described in the IMP, the Operational Plan will include consideration of any permitting requirements. Given that rat eradications have previously been implemented on Handa, the Applicant is confident that all the necessary permits can be obtained. The Applicant has completed an Environmental Impact assessment and a Report to Inform Appropriate Assessment to evidence how this compensatory measure complies with the relevant environmental regulations. These reports conclude that this compensatory measure is not likely to have a significant effect on any of the receptor groups scoped into the EIA, and that the measure will not have an adverse effect on the integrity of any European Site (alone and in-combination with other plans and projects).
Is the measure deliverable?	YES	It is anticipated that the Applicant's approach to delivery would be captured in a Colony Measures Implementation Plan (CMIP) that will be submitted to Scottish Ministers for approval post consent. The CMIP would be developed by the Applicant based on the IMP, and in consultation with all relevant stakeholders. The IMP, therefore, describes an outline approach to delivery, including various stages comprising pre-eradication monitoring, eradication, implementing biosecurity, post-eradication monitoring (both in the immediate term and long term), seabird monitoring, seabird habitat management and implementing

Feasibility Assessment	Y/N/?	Explanation
		an incursion response plan in case of re-incursion. The IMP provides detail on how each of these stages would be delivered, including indicative timescales.
Is the measure ecologically effective (i.e. sufficient)?	YES	There is reasonable certainty that rats can be eradicated from Handa, as this has previously been achieved successfully. The Colony Compensatory Measures (CCM) Evidence Report presents evidence from previous rat eradication campaigns to demonstrate that this compensatory measure would be ecologically effective i.e. improve seabird demographics on Handa. Using the benefits observed from previous rat eradications on Handa and other islands, the Applicant has estimated the likely benefit of the proposed compensatory measure by comparing seabird numbers, distribution and productivity data gathered in years with and without rats. These benefits have the potential to be lost if there is a reoccurrence of rats on Handa. Therefore, to ensure the continued success of this measure the Applicant has committed to implementing appropriate biosecurity measures, monitoring and adaptive management mechanisms. Handa Island is located off the north-eastern coast of Scotland, a relatively significant distance from the Proposed Development. However, the island is part of the Handa SPA of which kittiwake, razorbill and guillemot are all qualifying features. Therefore, rat eradication at Handa will directly benefit the national SPA network population for kittiwake, razorbill, puffin and guillemot features.
Will the measure be effective before adverse effects arise?	YES	The Applicant indicative timetable for this measure (IMP: section 3.5) requires the Applicant to implement an eradication and biosecurity measures prior to the operation of the windfarm. Whilst this will have an immediate benefit for certain seabird demographic parameters on Handa, it is recognised that the full benefit of this measure may only become fully realised after the Proposed Development becomes operational. However, it is important to emphasise that this compensatory measure forms part of a suite of measures, including management of sandeel fisheries in SA4. On its own, management of SA4 sandeel fisheries is expected to generate sufficient benefit prior to any adverse effects occurring (see Table 26).
Can the measure be secured?	YES	Handa Island is managed by Scottish Wildlife Trust (SWT) and is part of the Scourie Estate. Scourie Estate is supportive of the proposed compensatory measures and the Applicant is in the final stages of negotiating Heads of Terms with SWT and Scourie Estate to allow this measure to be implemented and monitored for the operational lifetime of the Proposed Development. As part of the Section 36 consent for the Proposed Development, licences will be issued by Scottish Ministers which will detail conditions which the Applicant must adhere to, or discharge. It is anticipated that a condition will be included by the Scottish

Feasibility Assessment	Y/N/?	Explanation
		Ministers with regards to securing compensatory measures. A draft condition for this compensatory measure has been provided by the Applicant in section 6 of the IMP.
Can success of the measure be monitored?	YES	It is anticipated that the Applicant's approach to monitoring would be captured in a Colony Measures Implementation Plan (CMIP) that will be submitted to Scottish Ministers for approval post consent. The CMIP would be developed by the Applicant based on the IMP, and in consultation with all relevant stakeholders. The IMP, therefore, describes the Applicant's outline approach to monitoring of this compensatory measure. Monitoring will take place both before and after the implementation of rat eradication and biosecurity measures and will include surveillance of rats and seabird demographics over the lifespan of the Proposed Development. This monitoring is integral to the success of the compensatory measure as it allows reoccurrences of rats to be dealt with swiftly and/or determines the necessity of adaptive management should it be found that the desired conservation targets are not progressing as forecasted.
How have uncertainties been addressed?	YES	Section 2 of the CCM Evidence Report lists the uncertainties associated with this compensatory measure and how they have been taken into account. The key uncertainty is the potential for future incursions and reinvasions of rats on Handa. However, the additional resource proposed to fund biosecurity measures, monitoring and rapid recursion response (if required) has been proposed to reduce this uncertainty and mitigate the risk. In the event that monitoring shows that this compensatory measure is not progressing towards the desired conservation target (in terms of benefits to seabird demographics on Handa), a suite of other adaptive management measures will be implemented. This includes (1) 'built-in' measures i.e. adaptations of this compensatory measure including improving seabird breeding success with habitat management; (2) a range of secondary measures identified within the compensatory measure selection process (section 17.4) but not taken forward as part of this Derogation Case; and (3) participation in strategic compensatory measures being developed by other bodies e.g. Defra and OWIC.
Is the measure additional?	YES	SWT are currently undertaking a trial of A24 traps at Handa; this trial will end in 2023 and at present there is no source of available funding or plan to continue to tackle the rats at Handa that are still present. The reoccurrence of rats following past eradications demonstrates that the level of resource SWT are currently able to dedicate to biosecurity is not sufficient to maintain Handa as rat free in the longer term.

Feasibility Assessment	Y/N/?	Explanation
		The CCM Evidence Report explains how there is insufficient resource to fund further systematic rodent eradication efforts – and historically this has ultimately led to reinvasion of rats and the return to high levels of rat activity. For the reasons outlined above, rat eradication and other seabird population enhancement measures proposed by the Applicant, at Handa, are additional and there is no other known mechanism whereby the necessary measures and efforts to eradicate/ control rats at Handa would otherwise be undertaken post 2023.

Table 25 Detailed Feasibility Assessment for Dunbar castle wardening role

Assessment of Sufficiency	Y/N/?	Explanation
Is the measure technically feasible?	YES	Funding a warden for the Kittiwake colony at Dunbar Castle was recommended during stakeholder consultation to improve the numbers of adults nesting at Dunbar and their breeding success. The benefits of having a 'Kittiwake warden' were unanimously agreed amongst stakeholders. The description of this measure is derived from stakeholder engagement, and therefore has the in-principle support of all stakeholders. Employing an individual site warden/ ranger is not a novel measure/technique to protect and enhance species and habitats in the UK and further afield.
Is the measure financially feasible?	YES	The proposal is for the warden to be employed by East Lothian Council (ELC) and this position would be fully funded by the Applicant. Agreement on this approach has been reached with ELC that the Applicant will provide appropriate funding to pay for the employment of the warden and the associated implementation of the various compensatory measures for a period of at least five years. Heads of Terms regarding this between the Applicant and ELC have been signed by both parties. Berwick Bank Wind Farm Ltd has sufficient resource to finance these costs. Berwick Bank Wind Farm Ltd is a wholly owned subsidiary of SSE plc SSE plc is rated highly against its peers and is currently rated BBB+ with stable outlook with Standard & Poors and Baa1 with stable outlook with Moody's. As well as the strong credit rating [and the £1.5bn of committed facilities] the SSE Group has also secured circa £1.8bn of debt since April 2024 which proves SSE's ability to fund in difficult market conditions to meet its financial obligations. SSE has a strong track record in securing project finance for the largest Offshore

Assessment of Sufficiency	Y/N/?	Explanation
		Wind Farm projects including Beatrice, Seagreen 1 and Dogger Bank. This provides confidence that SSE can meet the financial obligations of any necessary compensatory measures
Is the measure legally feasible?	YES	The Applicant has committed to producing a Kittiwake Management Plan as one of several implementing mechanisms for this compensatory measure. As described in the IMP, the Kittiwake Management will include consideration of any permitting requirements. Given that the measure has in-principle support of all stakeholders (and signed Heads of Terms with ELC), the Applicant is confident that all the necessary permits can be obtained (if required). The Applicant has completed an EIA Report and a RIAA to evidence how this compensatory measure complies with the relevant environmental regulations. These reports conclude that this compensatory measure is not likely to have a significant effect on any of the receptor groups scoped into the EIA, and that the measure will not have an adverse effect on the integrity of any European Site (alone and in-combination with other plans and projects).
Is the measure deliverable?	YES	It is anticipated that the Applicant's approach to delivery would be captured in a Colony Measures Implementation Plan (CMIP) that will be submitted to Scottish Ministers for approval post consent. The CMIP would be developed by the Applicant based on the IMP, and in consultation with all relevant stakeholders. The IMP, therefore, describes an outline approach to delivery, including various stages comprising baseline data collection, development of a Kittiwake Management Plan which will detail actions to manage disturbance, and actions to manage kittiwake habitat as well as monitoring plan detailing the approach to monitoring the kittiwakes at Dunbar. The IMP provides detail on how each of these actions would be delivered, including indicative timescales.
Is the measure ecologically effective (i.e. sufficient)?	YES	The Colony Compensatory Measures (CCM) Evidence Report presents evidence to demonstrate that this compensatory measure would be ecologically effective i.e. improve kittiwake productivity and population size at Dunbar Castle. At its peak in 2000 the colony numbered just short of 1,200 pairs. It is expected that bringing the colony back to this level from the 808 nests observed in 2020 would be a realistic conservation target of ~400 pairs (800 birds). The Applicant considers this conservation target to be feasible on the basis that the colony previously supported >1,100 pairs during several years during the noughties (2006, 2007 and 2010). It is thought likely that the birds will recolonise the Castle if it is fenced off to minimise human disturbance, the creels are removed, and the rodents brought under control. If birds are able to nest in the best habitat, then productivity would also be expected to improve.

Assessment of Sufficiency	Y/N/?	Explanation
		Dunbar Castle has been chosen by the Applicant partly because of its location, which is close to the Proposed Development and impacts to key species. Furthermore, Dunbar is within very close proximity to the Outer Firth of Forth and St Andrews Complex SPA of which kittiwake is a designated feature.
Will the measure be effective before adverse effects arise?	YES	The Applicant's indicative timetable for this measure (IMP, section 4.5) requires the Applicant to undertake baseline monitoring, employ a warden, develop a Kittiwake Management Plan, implement the measures within it, and monitor the colony prior to the operation of the windfarm. Whilst this will have an immediate benefit for certain seabird demographic parameters at Dunbar, it is recognised that the full benefit of this measure may only become fully realised after the Proposed Development becomes operational. However, it is important to emphasise that this compensatory measure forms part of a suite of measures, including management of sandeel fisheries in SA4. On its own, management of SA4 sandeel fisheries is expected to generate sufficient benefit prior to any adverse effects occurring (see Table 26).
Can the measure be secured?	YES	Dunbar Castle is managed by Dunbar Harbour Trust (DHT) who were transferred ownership by ELC. DHT and ELC are supportive of the proposed compensatory measures and the Applicant has signed Heads of Terms with ELC and will agree Heads of Terms with DHT to allow this measure to be implemented and monitored As part of the Section 36 consent for the Proposed Development, licences will be issued by Scottish Ministers which will detail conditions which the Applicant must adhere to, or discharge. It is anticipated that a condition will be included by the Scottish Ministers with regards to securing compensatory measures. A draft condition for this compensatory measure has been provided by the Applicant in section 6.5 of the IMP.
Can success of the measure be monitored?	YES	It is anticipated that the Applicant's approach to monitoring would be captured in a Colony Measures Implementation Plan (CMIP) that will be submitted to Scottish Ministers for approval post consent. The CMIP would be developed by the Applicant based on the IMP, and in consultation with all relevant stakeholders. The IMP therefore describes the Applicant's outline approach to monitoring of this compensatory measure. Monitoring will take place both before and after the implementation of the various compensatory measures by the warden as detailed within the IMP and will include monitoring both the kittiwakes and their nests, as well as activities causing pressure to the bird. surveillance of rats and seabird demographics over the lifespan of the Proposed Development. This monitoring is integral to the success of the compensatory measure as it determines the necessity of adaptive management should it be found that the desired conservation targets are not progressing as forecasted.

Assessment of Sufficiency	Y/N/?	Explanation
How have uncertainties been addressed?	YES	Section 3.6 of the CCM Evidence Report lists the uncertainties associated with this compensatory measure and how they have been taken into account. The key uncertainties include how long it will take to achieve the conservation target, the scale of human disturbance impacts at the site, and also to what extent disturbance can be minimised. However, a detailed Kittiwake Management Plan (informed by baseline data collection), including a Monitoring Plan, will be prepared in advance of implementing this measure which will detail how adaptive management will be implemented. In the event that monitoring shows that this compensatory measure is not progressing towards the desired conservation target (in terms of increases in kittiwake population size), a suite of other adaptive management measures will be implemented. This includes (1) 'built-in' measures i.e. adaptations of this compensatory measure including, as discussed in section 4.6 of the IMP; (2) a range of secondary measures identified within the compensatory measure selection process (section 17.4) but not taken forward as part of this Derogation Case; and (3) participation in strategic compensatory measures being developed by other bodies e.g. Defra and OWIC
Is the measure additional?	YES	The provision of a dedicated site warden and targeted management of disturbance and other factors which are negatively impacting on the Dunbar kittiwakes is additional to the work currently undertaken at this site, which is limited to annual colony counts. Since recent research indicates that the issues at Dunbar relate to colony management rather than prey (Searle et al. 2022, in prep.), then there is reasonable certainty that the measure would be effective in improving the success of this locally important colony. As the site is neither a SSSI nor an SPA it does not currently have a dedicated warden, although the birds are counted annually by the East Lothian Countryside Ranger Service (ELCRS), who have also monitored colony productivity in the past. Kittiwakes from Dunbar are also ringed by a local group. The Applicant is unaware of any other plans/ initiatives to manage the kittiwake colony at Dunbar Castle. Therefore, the Applicant's plan would be considered new and additional in this context.

17.5. STEP 4 SUFFICIENCY OF PROPOSED COMPENSATORY MEASURES

440. The Applicant has proposed two categories of compensation: colony-based measures which focus on improving productivity at relevant colonies and fisheries-based measures that aim to improve prey availability leading to both an increase in productivity and survival. These measures are complementary and, when implemented, will provide significant long-term benefits to relevant seabird populations. The section above has also demonstrated that the proposed measures are feasible, ecologically effective and can be secured.
441. The aim of implementing these compensatory measures is to ensure the overall coherence of the national site network, given the potential negative impacts of the Proposed Development. The table below shows the balance of overall annual impacts and benefits to the SPA network for both Fisheries Management and Colony Based Measures combined. This shows the high compensation ratios that the measures will deliver resulting in a significant compensation surplus and demonstrates that the proposed measures have sufficient substance and scale to offset any impacts from the Proposed Development, deal with any residual uncertainty and interim losses and - in the case of sandeel measures - provide a mechanism for compensation for impacts of future Scotwind projects. The compensation ratio has been assessed using the worst-case impacts derived from the Scoping Approach, and the most conservative estimate of the likely benefits.

Table 26 Balance of overall annual impacts and benefits to the SPA network for both Fisheries Management and Colony Based Measures combined

Species	SPA population	Adult Mortality (Scoping Approach)	Fisheries Measures Benefit	Colony Measures Benefit	Compensation Surplus	Species Compensation Ratio
Kittiwake	253,164	699	5,429	222	4,952	8.1
Guillemot	344,608	1,229.9	9,208	577	8,555	8.0
Puffin	178,139	30.2	4,925	56	4,951	164.9
Razorbill	113,842	71.2	452	160	541	8.6

442. Further details of the approach to assessing the scale of the benefits for each individual colony measures is shown in the CCM Evidence report. The FCM Evidence report provides further details on the methodologies to quantify the benefits from the proposed fisheries measures and also provides detailed PVA assessment to demonstrate the long-term benefit to SPA populations.

17.6. STEP 5 - PREPARE IMPLEMENTATION AND MONITORING PLAN

443. The Applicant has prepared a detailed Implementation and Monitoring Plan as part of its Derogation Case submission. The IMP provides the evidence to Scottish Ministers that the selected compensatory measures can be delivered in a timely manner and can be relied upon to secure the overall coherence of the national site network.

18. SUMMARY OF PART D COMPENSATION

444. The Applicant has proposed a suite of compensatory measures which has been selected through a rigorous iterative process involving careful consideration and testing of options, stakeholder consultation and refinement. There is sufficient evidence to support the rationale for the final selection, which is as follows:
- Management of the SA4 sandeel fishery – full closure or ecosystem management of SA4 sandeel fishery
 - Rat eradication and biosecurity measures at Handa island
 - Dunbar castle wardening role
445. Each of these compensatory measures should not be considered in isolation, but rather together as a 'suite' as the measures are interactive and synergistic.
446. Management of sandeel fishery SA4 is considered the principal (highest benefit) measure and tangible benefits will be realised immediately following its implementation and will remain constant while other measures mature.
447. The suite of compensatory measures will provide significant additional kittiwakes, guillemots, razorbills and puffins into the UK population – with total numbers far in excess of those required to offset the impacts from the Proposed Development. The impacts presented have been calculated using an approach that the Applicant considers to be over-precautionary, and the total anticipated increases in seabird numbers (i.e. the benefits from the compensation) have been presented with a degree of conservatism. Together, this suggest that the actual realised numbers are likely to be higher.
448. These measures are substantial and provide a comprehensive solution that will maintain and enhance the national site network as well as provide high compensation ratios which deliver significant deliver a compensation surplus which is likely to benefit future offshore wind farm proposals in Scottish waters.

19. DEROGATION CASE CONCLUSIONS

449. This derogation case has provided an overview of the Project and the unique opportunity that it represents to deliver timely solutions to both the climate and the biodiversity crisis. The Project objectives are clear and derived from Scottish and UK policy and can only be met by a project of this scale in this location. The need for the Project has been set out in comprehensive detail in the statement of need report.
450. An overview of the relevant legislation has provided an explanation of the three tests that a derogation case must satisfy to receive consent from Scottish Ministers.
- There are no alternative solutions to the proposed project
 - The Project should be carried out for imperative reasons of overriding public interest
 - Necessary compensation measures are taken to ensure the overall coherence of the national site network is protected
451. Reasons and evidence have been provided to demonstrate, that there are no alternatives to the Project and that it should be carried for IROPI. Based on extensive consultation and research compensation measures have been developed that are feasible, additional, can be secured and will deliver compensation to offset the impact of the Proposed Development and ensure that the overall coherence of the national site network is protected. The measures have been designed to deliver high compensation ratios to cover even the most precautionary assessment of AEOI.
452. Scottish Ministers can be confident that this derogation case provides the required level of evidence and information to allow the Proposed Development to be consented under the HRA Derogation Provisions.

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The Wildlife and Countryside Act 1981	Wildlife and Countryside Act. 1981. Available at: https://www.legislation.gov.uk/ukpga/1981/69

EUROPE / INTERNATIONAL

COP26	26 th UN Climate Change Conference of the Parties (COP26). Available at: https://ukcop26.org/
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APPENDIX 1: CONSULTATION LOG

1. This appendix summarises all consultation and engagement undertaken to date in relation to the Derogation Case for The Proposed Development. Table 1 provides an overview of all meetings held, the purpose of the meeting and attendees.
2. Consultation is recognised by the Applicant as being a key feature of the development of the compensatory measures, which continues throughout the lifecycle of these measures, from their initial conceptual stages through to implementation and monitoring
3. The Applicant has undertaken extensive and thorough consultation and engagement specifically in relation to the Derogation Case. As outlined in Table 1 a wide group of key stakeholders has been engaged with including statutory stakeholders, those with an interest in seabirds and fisheries as well as local stakeholders who the Applicant will collaborate with as the compensatory measures are implemented and monitored. The Applicant is committed to continuous and further dialogue with all interested parties through the further development and refinement of the compensatory measures towards their implementation. The Applicant has considered all representations made in meetings, feedback from discussions and responses from stakeholders as appropriate throughout the preparation of the suite of documents supporting the Derogation Case.
4. As outlined within Table A1, workshops were held with key stakeholders specifically in relation to the compensatory measures proposed by the Applicant. In these workshops there were detailed discussions regarding the proposed compensatory measures and advice was requested of stakeholders and subsequently responded to in the following workshops. This collaborative approach to consultation workshops allowed for stakeholder feedback to be considered as appropriate throughout the development of the compensatory measures. Specific feedback from stakeholders regarding the workshop processes included:
 - “We value and commend the process you have undertaken to date and in particular note how helpful and focused the meetings and background reports have been” (NatureScot).
 - “Firstly we would like to acknowledge the significant work that has gone into the draft derogation case, we have found the engagement on this useful and informative” (MS-LOT).
 - “We welcome SSE Renewables work on a derogation case. We also appreciate your significant work into potential compensation options, and the amount of supporting information you have shared with us throughout this process” (RSPB).

Table A27 Derogation Case Meetings

Date	Purpose	Attendees
April 2021 to July 2021	Questionnaires and interviews with stakeholders with an interest in Special Protection Areas (SPAs) that may be impacted by the Proposed Development.	• Royal Society for the Protection of Birds (RSPB); • Scottish Seabird Centre; • Centre for Ecology and Hydrology (CEH); • National Trust for Scotland (NTS); • The National Trust; • Scottish Wildlife Trust (SWT); • Local ornithological consultant; • Local bird ringer/ornithological expert; • NatureScot; and • Marine Scotland (MS).
6th October 2021	Presentation of outline proposals for compensation measures, including potential closure of sandeel fisheries.	• RSPB; and • The Applicant.
27th Oct 2021	Compensation inception meeting to present the Applicant's approach to the derogation case.	• NatureScot; • Marine Scotland Licensing Operations Team (MS-LOT); and • The Applicant.
18th November 2021	Meeting to discuss approaches to sandeel management and impact on seabirds.	• RSPB; and • The Applicant.
16th December 2021	Meeting with Defra on Sandeel Consultation organised by Scottish Renewables	• Department for Environment, Food and Rural Affairs (Defra); • Scottish Renewables; and • The Applicant.
12th January 2021	Meeting to discuss approach to compensation at The Proposed Development.	• NatureScot; and • The Applicant.
20th January 2022	Meeting with RSPB Planning and Policy team to discuss compensation measures and potential sandeel closures	• RSPB; and • The Applicant.
25th January 2022	Meeting to review approach to potential sandeel closures and Joint Fisheries Statement	• RSPB Policy Team; and • The Applicant.
28th January 2022	Meeting with Scottish Fishermen's Federation (SFF) and FRS to discuss sandeel fisheries measures	• SFF; • Fishing Industry Representatives (FIRs); and • The Applicant.
2nd February 2022	Meeting to discuss strategic approach to offshore wind farm development and Marine Net Gain	• RSPB; • Nature Bureau; and • The Applicant.

Date	Purpose	Attendees
4 th February 2022	Meeting with Marine Scotland to discuss approach to sandeel fisheries closures	• Marine Scotland – Policy and Technical Fisheries Staff; and • The Applicant.
8 th February 2022	<u>Compensation Consultation Meeting#1</u> • Overview of approach to compensation plan • Summary of compensation measures – Colony Based Measures – Fisheries Based Measures – Sandeel Closure Research • Advice Requested from stakeholders – Process – Colony – Fisheries	• MS-LOT; • NatureScot; • RSPB; • Crown Estate Scotland (CES); • CEH; • The Applicant; • ABPmer; • MacArthur Green; • ECON; and • GoBe.
22 nd February 2022	Meeting with Scottish Seabird centre regarding The Proposed Development and compensation measures	• Scottish Seabird Centre; and • The Applicant.
25 th February 2022	Detailed presentation on sandeel proposals to SFF staff	• SFF; and • The Applicant.
2 nd March 2022	Meeting with Natural England to discuss compensation measures and offshore wind development	• Natural England; and • The Applicant.
11 th March 2022	Meeting with SFF scientific officer to present evidence on sandeel closures and benefits to birds and fishing	• SFF; • The Applicant; and • MacArthur Green.
16 th March 2022	Meeting with RSPB Chief executive to update on project activities and compensation measures proposals	• RSPB; and • The Applicant.
17 th March 2022	Meeting with RSPB regarding the Joint Fisheries Statement and Sandeels	• RSPB; and • The Applicant.
23 rd March 2022	Meeting with Defra to discuss approach to sandeel Management	• Defra; and • The Applicant.
30 th March 2022	<u>Consultation Meeting #2</u> • Overview of Colony Based Measures – Summary of benefits – Rodent Removal from Islands – Diversionary Feeding – Supplementary Feeding – Gannet Harvest	• MS-LOT; • NatureScot; • RSPB; • CES; • CEH; • The Applicant; • ABPmer; • MacArthur Green; and • GoBe.

Date	Purpose	Attendees
	• Overview of Fisheries Based Measures – Sandeel Stock – Impact of Dredging on Sandeels – Efficacy of measures – Sample PVAs • Advice Requested – Fisheries – Colony – Process	
27th May 2022	Meeting with SFF and FRS to discuss sandeel fisheries measures as part of regular consultation meeting	• SFF; • FRS; and • The Applicant.
3rd June 2022	Meeting with Forth and Tay Seabird Group to discuss proposed compensatory measures on Inchcolm Island and wider monitoring work	• Forth and Tay Seabird Group; and • The Applicant.
6th June 2022	Meeting with Scottish Wildlife Trust to discuss proposed compensatory measures on Handa Island	• SWT; • The Applicant; and • ABPmer.
6th June 2022	Meeting with RSPB policy team to discuss approaches to offshore wind development	• RSPB Policy Team; and • The Applicant
8th June 2022	<u>Stakeholder Consultation Meeting #3</u> • Introductions and Feedback – Update on Colony Based Measures • Colony Based Measures Review • Rodent Removal - Inchcolm • Rodent Removal – Handa • Dunbar Kittiwakes • Update on Fisheries Based Measures – Sandeel TSB and impact on seabird demography – Observations on CEH paper • Advice Requested – Colony – Fisheries – Process	• MS-LOT; • NatureScot; • RSPB; • CES; • The Applicant; • ABPmer; • MacArthur Green; and • GoBe.

Date	Purpose	Attendees
27 th June 2022	Meeting to discuss research projects for lobster and crab fishing, and new approaches to scallop fishing	• MacArthur Green; • Fishtek Marine; and • The Applicant.
30 th June 2022	Meeting with Scottish Seabird Centre to discuss approaches to monitoring Kittiwakes at Dunbar Castle	• Scottish Seabird Centre; and • The Applicant.
22 nd July 2022	Project update meeting with SFF	• SFF; and • The Applicant.
2 nd August 2022	Meeting with RSPB policy Team	• RSPB Policy Team; and • The Applicant
25 th August 2022	Meeting with HES to discuss proposed compensatory measures at Inchcolm	• HES; and • The Applicant.
21 st September 2022	<u>Stakeholder Consultation Meeting #4</u> • Derogation Case – Structure – Next Steps • Modelled Impacts and Benefits • Colony Based Measures – Update on measures • Fisheries Based Measures – Effectiveness – Quantification • Advice Requested – Colony – Fisheries – Process	• MS-LOT; • NatureScot; • RSPB; • The Applicant; • ABPmer; and • MacArthur Green.
26 th September 2022	Meeting with RSPB Policy Team to discuss the project	• RSPB Policy Team; and • The Applicant.
19 th October 2022	Project update with Seabird Centre	• Scottish Seabird Centre; and • The Applicant
27 th October 2022	Workshop to discuss proposed use of artificial Intelligence for monitoring of Kittiwakes at Dunbar Castle	• Scottish Seabird Centre; • Forth Seabird Group; • East Lothian Council (ELC); • Dunbar Harbour Trust (DHT); • Dunbar Harbour Master; and • The Applicant.
28 th October 2022	Project update meeting with the National Trust for Scotland	• St Abbs team and NTS specialist staff; and • The Applicant.

Date	Purpose	Attendees
1st November 2022	Meeting with HES to discuss predator eradication on Inchcolm	• HES; and • The Applicant
10th November 2022	Project update meeting with RSPB Scotland	• RSPB; and • The Applicant
11th November 2022	Project update meeting with NatureScot	• NatureScot; and • The Applicant
14th November 2022	Project update meeting with SFF	• SSF; and • The Applicant.
18th November 2022	Meeting with ELC to discuss proposed compensatory measures at Dunbar Castle	• ELC; • The Applicant

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