Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

Marine and Coastal Access Act (MCAA) Derogation: Provision of Evidence

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Prepared by: **Royal HaskoningDHV**		
Approved by: **Sarah Chandler, Equinor**	Date: August 2022	

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Glossary of Acronyms

°C	degree Celsius
AC	Alternating Current
BEIS	Department for Business, Energy & Industrial Strategy
CBRA	Cable Burial Risk Assessment
CCC	Committee on Climate Change
CCRA	Climate Change Risk Assessment
CfD	Contract for Difference
CO_2	Carbon Dioxide
COP	Conference of the Parties
CSCB	Cromer Shoal Chalk Beds
CSIMP	Cable Specification and Installation Monitoring Plan
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
DEL	Dudgeon Extension Limited
DEP	Dudgeon Offshore Wind Farm Extension Project
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Group
FOCI	Features of Conservation Interest
FTE	Full-Time equivalent
GVA	Gross Value Added
GW	Gigawatt
HDD	Horizontal Directional Drilling
HM	Her Majesty's
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
IROPI	Imperative Reasons of Overriding Public Interest
JNCC	Joint Nature Conservation Committee
km	Kilometre
m	Metre
MCAA	Marine and Coastal Access Act

MCZ	Marine Conservation Zone
MEEB	Measures of Equivalent Environmental Benefit
MMO	Marine Management Organisation
MPA	Marine Protected Area
MW	Megawatt
NASA	National Aeronautics and Space Administration
NOAA	National Oceanographic and Atmospheric Administration
NNR	National Nature Reserve
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Projects
OMoP	Other Means of Proceeding
ORE	Offshore Renewable Energy
OSP	Offshore Substation Platform
SAC	Special Area of Conservation
SEL	Scira Extension Limited
SEP	Sheringham Shoal Offshore Wind Farm Extension Project
SNCB	Statutory Nature Conservation Body
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
UK	United Kingdom
WMO	World Meteorological Organization

Glossary of Terms

Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
DEP North array area	The wind farm site area of the DEP offshore site located to the north of the existing Dudgeon Offshore Wind Farm
DEP South array area	The wind farm site area of the DEP offshore site located to the south of the existing Dudgeon Offshore Wind Farm
DEP wind farm site	The offshore area of DEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area. This is also the collective term for the DEP North and South array areas.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Grid option	Mechanism by which SEP and DEP will connect to the existing electricity network. This may either be an integrated grid option providing transmission infrastructure which serves both of the wind farms, or a separated grid option, which allows SEP and DEP to transmit electricity entirely separately.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
Infield cables	Cables which link the wind turbines to the offshore substation platform(s).
Interlink cables	Cables linking two separate project areas. This can be cables linking: - DEP South array area and DEP North array area - DEP South array area and SEP - DEP North array area and SEP
Landfall	The point at the coastline at which the offshore export cables are brought onshore, connecting to the onshore cables at the transition joint bay above mean high water
Offshore cable corridors	This is the area which will contain the offshore export cables or interlink cables, including the adjacent Offshore Temporary Works Area.
Offshore export cable corridor	This is the area which will contain the offshore export cables between offshore substation

	platform/s and landfall, including the adjacent Offshore Temporary Works Area.
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall. 220 – 230kV.
Offshore substation platform (OSP)	A fixed structure located within the wind farm site/s, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore Temporary Works Area	An Offshore Temporary Works Area within the offshore Order Limits in which vessels are permitted to carry out activities during construction, operation and decommissioning encompassing a 200m buffer around the wind farm sites and a 750m buffer around the offshore cable corridors. No permanent infrastructure would be installed within the Offshore Temporary Works Area.
Onshore cable corridor	The area between the landfall and the onshore substation sites, within which the onshore cable circuits will be installed along with other temporary works for construction.
Onshore export cables	The cables which would bring electricity from the landfall to the onshore substation. 220 – 230kV.
Onshore substation	Compound containing electrical equipment to enable connection to the National Grid.
Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
SEP wind farm site	The offshore area of SEP within which wind turbines, infield cables and offshore substation platform/s will be located and the adjacent Offshore Temporary Works Area.
The Applicant	Equinor New Energy Limited. As the owners of SEP and DEP, Scira Extension Limited (SEL) and Dudgeon Extension Limited (DEL) are the named undertakers that have the benefit of the Development Consent Order. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of SEL and DEL as the undertakers of SEP and DEP.

1 INTRODUCTION

1.1 Project Background

1. Equinor New Energy Limited ('the Applicant') is applying for a Development Consent Order (DCO) for the Sheringham Shoal Offshore Wind Farm Extension Project (SEP) and Dudgeon Offshore Wind Farm Extension Project (DEP). As set out in the Environmental Statement (ES) **Chapter 1 Introduction** (document reference 6.1.1), whilst SEP and DEP have different ownership and are each Nationally Significant Infrastructure Projects (NSIPs) in their own right, a single coordinated application for development consent has been developed and is submitted for both Projects, and the associated transmission infrastructure. A single planning process and DCO application are intended to provide consistency in the approach to the assessment, consultation and examination.
2. As owners of SEP and DEP, Scira Extension Limited (SEL) and Dudgeon Extension Limited (DEL) are the named undertakers that have the benefit of the DCO. References throughout this document and any supporting annexes to obligations on, or commitments by, 'the Applicant' are given on behalf of SEL and DEL as the undertakers of SEP and DEP.
3. When operational, SEP and DEP combined would have the potential to generate renewable power for approximately 785,000 United Kingdom (UK) homes from up to 23 wind turbines at SEP and up to 30 wind turbines at DEP.
4. Electricity will flow from the wind turbines via infield (array) cables to offshore substation platform/s (OSP). There will be up to two OSPs with one in the DEP North array area and one in the SEP wind farm site, located to optimise the length of the offshore cables. Interlink cables will link the separate project areas. At the offshore substation/s, the generated power will be transformed to a higher alternating current (AC) voltage. The power will be exported through up to two export cables, in two separate trenches, to a landfall in Weybourne on the North Norfolk coast. The export cables will be located within the offshore export cable corridor which overlaps with the Cromer Shoal Chalk Beds (CSCB) Marine Conservation Zone (MCZ) (**Figure 1-1**).
5. At the landfall location, the offshore export cables will meet and be joined up with the onshore export cables in a transition joint bay. From there, the onshore export cables travel approximately 60km inland to a high voltage alternating current (HVAC) onshore substation near to the existing Norwich Main substation. The onshore substation will be constructed to accommodate the connection of both SEP and DEP to the transmission grid.

6. As discussed in **ES Chapter 4 Project Description** (document reference 6.1.4), the Applicant is seeking to coordinate the development of SEP and DEP as far as possible. The preferred option is a development scenario with an integrated transmission system, providing transmission infrastructure serving both of the wind farms, where both Projects are built concurrently. However, given the different commercial ownerships of each Project, alternative development scenarios such as a separated grid option (i.e. transmission infrastructure which allows each Project to transmit electricity entirely separately) will allow SEP and DEP to be constructed in a phased approach, if necessary. Therefore, the DCO application seeks to consent a range of development scenarios in the same overall corridors to allow for separate development if required, and to accommodate either sequential or concurrent build of the two Projects.

7. Reasons for the requirement to retain separate and phased (sequential) development scenarios alongside more coordinated approaches are further described in the **Scenarios Statement** (document reference 9.28).

Sheringham Shoal and Dudgeon Extension Projects

Title:

Figure 1.1 SEP and DEP Location

Document:

DCO Document
Marine and Coastal Access Act Derogation:
Provision of Evidence

Application Doc. no.: 5.7

Legend:

- Dudgeon Offshore Wind Farm Extension Project Wind Farm Site
- Sheringham Shoal Offshore Wind Farm Extension Project Wind Farm Site
- Offshore Cable Corridors
- Existing Offshore Wind Farm Export Cable
- Offshore Temporary Work Area
- Existing Offshore Wind Farm
- Cromer Shoal Chalk Beds Marine Conservation Zones (MCZ)

Coordinate Reference System: WGS 1984 UTM Zone 31N
Transformation WGS84: OSGB_1936_To_WGS_1984_7

0 7.5 15 km
0 4 8 Miles

Scale: 1:250,000 Scale at size: A3

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B	22/07/2022	Second Issue	GC	GK	PM
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1.2 Purpose of this Document

8. This document provides a case of evidence to support Stage 2 (Derogation) of the Marine Conservation Zone Assessment process under the Marine and Coastal Access Act 2009 (MCAA), in accordance with Guidance published by the Marine Management Organisation (MMO, 2013). This document is informed by a **Stage 1 CSCB MCZ Assessment** (document reference 5.6) which concludes that the conservation objectives of the CSCB MCZ will not be hindered by SEP and/or DEP. However, in response to discussions with the Sea bed Expert Topic Group (ETG), the Applicant is providing a derogation case, without prejudice of its position that the conservation objectives of the CSCB MCZ will not be hindered. This approach is in accordance with the draft Overarching National Policy Statement for Energy (NPS EN-1), the draft National Policy Statement for Renewable Energy (NPS EN-3) and statements from the Secretary of State in the Hornsea Project Three, Norfolk Boreas, Norfolk Vanguard and East Anglia TWO and ONE North decisions (**Section 2.2**).

9. This document providing the Applicant's submission in relation to Stage 2 of the MCZ Assessment (Derogation), includes evidence in relation to:
   - No other means of proceeding (**Section 4**);
   - Clear public benefits (**Section 5**); and
   - In-principle measures of equivalent environmental benefit (MEEB) (**Section 6** and **Appendix 1 In-Principle MEEB Plan** (document reference 5.7.1)).

10. **Sections 2 and 3** provide the legislative context and information on the CSCB MCZ relevant interest features, respectively.

2 LEGISLATIVE AND POLICY CONTEXT

2.1 Legislation

2.1.1 The Marine and Coastal Access Act

11. The Marine and Coastal Access Act 2009 (MCAA) establishes a range of measures to manage the marine environment, including establishing MCZs. The MCZ Project was established in 2008 by the Joint Nature Conservation Committee (JNCC) and Natural England to work with regional stakeholder led projects to identify and recommend MCZs to Government. The designation of MCZs is now complete.

12. Sections 125 and 126 of the MCAA place specific duties on the MMO relating to MCZs and marine licence decision making.

13. Where significant risk of hindering the achievement of the MCZ conservation objectives cannot be ruled out, the authority must not grant authorisation unless the following conditions (Section 126(7) of the MCAA) can be met:

    "(a) there is no other means of proceeding with the act which would create a substantially lower risk of hindering the achievement of those objectives,

    (b) the benefit to the public of proceeding with the act clearly outweighs the risk of damage to the environment that will be created by proceeding with it, and

(c) the person seeking the authorisation will undertake, or make arrangements for the undertaking of, measures of equivalent environmental benefit to the damage which the act will or is likely to have in or on the MCZ."

14. These tests comprise the MCAA derogation case.

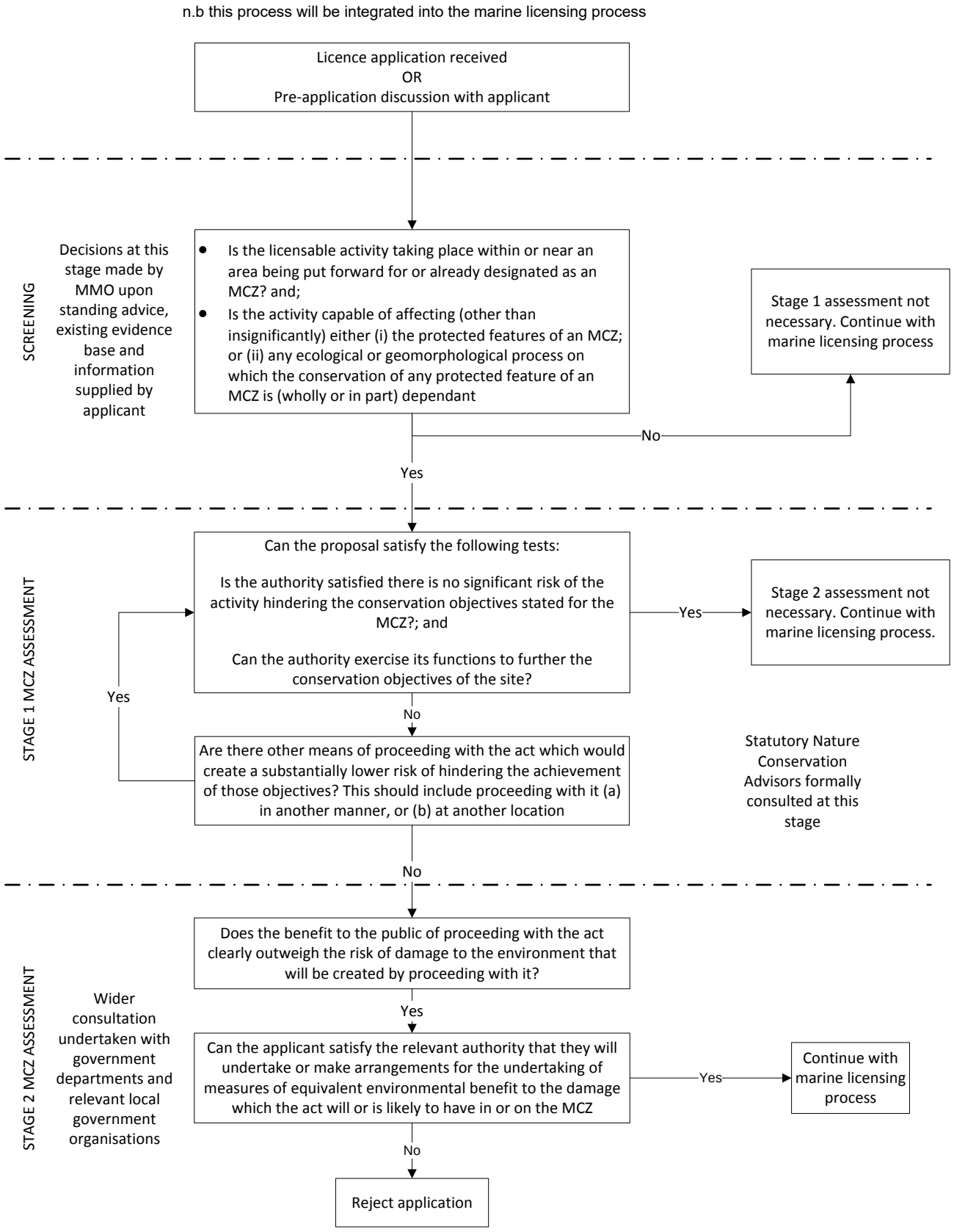
2.1.1.1 Marine Conservation Zone Assessment

15. Guidance published by the MMO (2013) describes how MCZ Assessments should be undertaken in the context of marine licensing decisions (Note: there is no published Planning Inspectorate guidance or advice on MCZ Assessments for DCO applications).

16. To undertake its marine licensing function, the MMO has introduced a three stage sequential assessment process for considering impacts on MCZs, in order for it to deliver its duties under Section 126 of the MCAA.

17. The MCZ Assessment process is similar to, but separate from, the Habitats Regulations Assessment (HRA) process. The stages of MCZ Assessment are presented below in **Figure 2-1**. This document provides the Stage 2 MCZ Assessment.

Figure 2-1 Flow chart summary of the MCZ Assessment process used by the MMO during marine licence determination (MMO, 2013)



2.2 Policy

18. The draft Overarching National Policy Statement for Energy (NPS EN-1) (BEIS, 2021a) and draft National Policy Statement for Renewable Energy (NPS EN-3) (BEIS, 2021b) outline the requirements for Applicant's to provide evidence to support a derogation case at the application stage, where the SNCB has advised that it may not be possible to rule out a risk of hindering the conservation objectives of an MCZ (**Table 2-1**).

19. The need for information to be provided at the application stage was also stated by the Secretary of State in the Hornsea Project Three[1] and Norfolk Boreas[2] decision letters: "*in order to maintain the efficient functioning of the development consenting regime, he may not always request post-examination representations on such matters, indeed it should be assumed that he will not do so, and he may therefore make decisions on such evidence as is in front of him following his receipt of the ExA's Report*".

Table 2-1 Relevant Policies of the NPS and Draft NPS

Paragraph	Policy
NPS EN-1 Paragraph 5.3.2	*"Marine Conservation Zones (MCZs) (Marine Protected Areas in Scotland), introduced under the Marine and Coastal Access Act 2009, are areas that have been designated for the purpose of conserving marine flora or fauna, marine habitats or types of marine habitat or features of geological or geomorphological interest. The protected feature or features and the conservation objectives for the MCZ are stated in the designation order for the MCZ, which provides statutory protection for these areas implemented by the MMO (see paragraph 1.2.2). As a public authority, the [Secretary of State]] is bound by the duties in relation to MCZs imposed by sections 125 and 126 of the Marine and Coastal Access Act 2009".*
draft NPS EN-1, paragraph 4.2.10	"*If, during the pre-application stage, the SNCB indicate that the proposed development is likely to adversely impact the integrity of HRA sites, the applicant must include with their application such information as may reasonably be required to assess a potential derogation under the Habitats Regulations…. Applicants must have discussed with SNCB whether any proposed compensation is appropriate, and the compensation must be secured, or an indication given as to how it can be secured. Provision of such information will not be taken as an acceptance of adverse impacts and if an applicant disputes the likelihood of adverse impacts, it can provide this information without prejudice to the Secretary of State's final decision on the impacts of the potential development. If, in these circumstances, an applicant does not supply information required for the assessment of a potential derogation, there will be no expectation that the Secretary of State will allow the applicant the opportunity to provide such information following the examination.*"
draft NPS EN-3, paragraph 2.24.12	"*With increasing deployment of offshore wind farms, cumulative environmental impacts upon HRA sites and MCZs may not be able to be addressed by mitigation alone, therefore compensation measures may be required where*

[1] Hornsea Project Three decision letter: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-003265-EN010080%20Hornsea%20Three%20-%20Secretary%20of%20State%20Decision%20Letter.pdf

[2] Norfolk Boreas decision letter: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-002917-NORB-Boreas-Decision-Letter.pdf

Paragraph	Policy
	adverse effects on site integrity and/or on conservation objectives cannot be ruled out. In such cases, derogation for Imperative Reasons of Overriding Public Interest (IROPI) and associated compensatory measures under the Habitats Regulations, or derogation where the benefit to the public clearly outweighs the risk of damage to the environment and associated measures of equivalent environmental benefit (MEEB) under Marine and Coastal Access Act, may be necessary to allow deployment to continue."
draft NPS EN-3, paragraph 2.24.13	*As set out in [draft] EN-1 (paragraphs 4.2.9 - 4.2.13) as a general principle, development should at the very least aim to avoid significant impacts to protected sites, including through mitigation and consideration of reasonable alternatives. Where such a significant impact cannot be avoided then appropriate compensation measures should be sought. In instances where the HRA determines that an energy infrastructure development proposal will result in significant adverse effects to a protected site, then the applicant should propose compensatory measures that compensate for those adverse effects identified.*
draft NPS EN-3, paragraph 2.24.14	"*If, during the pre-application stage, statutory nature advisors indicate that the proposed development is likely to adversely impact a protected site, the applicant should include with their application such information as may reasonably be required to assess potential derogations under the Habitats Regulations or the Marine and Coastal Access Act."*
draft NPS EN-3, paragraph 2.24.15	*"It is vital that applicants consider the need for compensation as early as possible in the design process as 'retrofitting' compensatory measures will introduce delays and uncertainty to the consenting process. Applicants should work with statutory nature conservation advisors and Defra to develop a compensation plan for all protected sites adversely affected by the development and include this plan with their application to the Secretary of State".*
draft NPS EN-3, paragraph 2.24.16	"*Where several developers are likely to have cumulative impacts on the same species or feature it may be appropriate to collaborate with each other on compensation measures. Applicants may also want to coordinate with other marine industry sectors also needing to find compensatory measures. Defra will be publishing guidance imminently to help applicants consider how compensation should be developed."*
draft NPS EN-3, paragraph 2.24.17	*"the scale of offshore wind developments and potential in-combination effects means compensation could be required and applicants should refer to the latest Defra compensation guidance when making their assessments."*

3 CROMER SHOAL CHALK BEDS MCZ AND RELEVANT INTEREST FEATURES

20. The CSCB MCZ extends from Weybourne to Happisburgh, approximately 200m seaward from low water mark to a distance of between 5 and 10km offshore, enclosing an area of 315.64km^2 (Net Gain, 2011).

3.1 Conservation Objectives

21. The following CSCB MCZ conservation objectives apply to the site and its individual protected features:

"*The CSCB MCZ conservation objective is that the protected habitats:*

- *1. are maintained in favourable condition if they are already in favourable condition*

- *2. be brought into favourable condition if they are not already in favourable condition*

For each protected feature, favourable condition means that, within a zone:

- *1. its extent is stable or increasing*
- *2. its structure and functions, its quality, and the composition of its characteristic biological communities (including diversity and abundance of species forming part or inhabiting the habitat) are sufficient to ensure that its condition remains healthy and does not deteriorate*

For the feature of geological interest, favourable condition means that, within a zone:

- *1. its extent, component elements and integrity are maintained*
- *2. its structure and functioning are unimpaired*
- *3. its surface remains sufficiently unobscured for the purposes of determining whether the conditions in paragraphs (1) and (2) are satisfied."*

Any temporary deterioration in condition is to be disregarded if the habitat is sufficiently healthy and resilient to enable its recovery.

Any alteration to a feature brought about entirely by natural processes is to be disregarded when determining whether a protected feature is in favourable condition."

22. A condition assessment has not yet been undertaken for the CSCB MCZ.

3.2 Designated Features

23. The site is designated for the features listed in **Table 3-1**. Those shown in bold are potentially relevant due to their spatial overlap with the offshore cable corridor for SEP and DEP.

Table 3-1: MCZ Protected Features with Overlap of the Export Cable Corridor (✓)

Protected feature	Type of feature	Potential interaction with SEP/DEP offshore export cables
High energy circalittoral rock	Broadscale marine habitat	× HDD beyond nearshore rock/chalk
High energy infralittoral rock	Broadscale marine habitat	× HDD beyond nearshore rock/chalk
Moderate energy circalittoral rock	Broadscale marine habitat	× HDD beyond nearshore rock/chalk
Moderate energy infralittoral rock	Broadscale marine habitat	× HDD beyond nearshore rock/chalk
Subtidal coarse sediment	Broadscale marine habitat	✓ (long term habitat loss)
Subtidal mixed sediments	Broadscale marine habitat	✓ (long term habitat loss)
Subtidal sand	Broadscale marine habitat	✓ (long term habitat loss)
Peat and clay exposures	Marine habitat (FOCI)	× Not recorded in export cable corridor
Subtidal chalk	Marine habitat (FOCI)	× HDD beyond nearshore rock/chalk

Protected feature	Type of feature	Potential interaction with SEP/DEP offshore export cables
North Norfolk Coast assemblage of subtidal sediment features and habitats	Feature of geological interest	Natural England (2018) states "*given the characteristics of the geomorphological feature we advise that the other features of the Cromer Shoal MCZ can be used as a proxy when considering operational/ activities impacts in the interim.*"

4 NO OTHER MEANS OF PROCEEDING

4.1 Introduction

24. SEP and DEP are extensions to the existing Sheringham Shoal and Dudgeon offshore wind farms which were identified during the 2017 extension leasing round. The selection process undertaken by TCE was informed by a plan level HRA of all the offshore wind farm extension applications received, which was completed in August 2019 (TCE, 2019a). Key criteria that influenced the TCE process included that wind farm extensions must share a boundary with the existing (parent) wind farm; and that other than the existing wind farm, the proposed extension/s must not encroach within a radius of 5km of any other wind farm (unless the tenant of any such wind farm had confirmed its agreement otherwise). The latter consideration limited the proposed boundary of the SEP wind farm site to the west due to an application to extend the Race Bank offshore wind farm from its eastern boundary. In addition, the TCE application criteria required that the proposed wind farm to be extended must be constructed and fully operational at the date of the application. Equinor also took into account the requirement for the size of the proposed extension to be of an appropriate scale to the existing site, and to only apply for an area that was necessary and proportional to the installed capacity, taking account of necessary flexibility.

4.2 Approach to Assessing Other Means of Proceeding

25. The Defra (2021) draft compensation guidance states the assessment of Other Means of Proceeding (OMoP) should include:

"*all feasible, less harmful and reasonable options and, the applicant should be asked to justify its reasoning for discounting alternatives. This could include looking at whether the proposal could happen at a different location, using different routes across a site or making changes to scale, method, size or timing. These are not exhaustive, and the responsible authority should consider what is appropriate for the application on a case-by-case basis, including both operational and decommissioning aspects*.

Defra's policy position is that ecological criteria, conservation objectives and network status should outweigh economic considerations over the lifetime of the activity. While alternative solutions should be legally and technically feasible, options should not usually be discounted for purely financial reasons.

Alternative solutions or other means of proceeding should be limited to those which would deliver the same overall outcome for the activity whilst creating a substantially lower risk of impact to the MPA."

26. Section 126(8) of the MCAA states "*other means of proceeding with an act includes a reference to proceeding with it —*

(a) in another manner, or

(b) at another location"

27. Established Government policy in NPS EN-1 designated by the Secretary of State also sets limits on alternatives that may be considered in decisions on development consent applications. Whilst this policy applies to development consent decisions rather than specifically to the HRA, it lends emphasis to principles established in the Defra Guidance, in particular where it states in paragraph 4.4.3 that the Secretary of State

"should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security and climate change benefits) in the same timescale as the proposed development;…

alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant

…

alternative proposals which are vague or inchoate can be excluded on the grounds that they are not important and relevant to the [SoS]'s decision".

28. Paragraph 4.2.13 of draft NPS EN-1 (2021) contains similar draft policy:

"the Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivering the same infrastructure capacity (including energy security, climate change, and other environmental benefits) in the same timescale as the proposed development

…

alternative proposals which mean the necessary development could not proceed, for example because the alternative proposals are not commercially viable or alternative proposals for sites would not be physically suitable, can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision

…

alternative proposals which are vague or inchoate can be excluded on the grounds that they are not important and relevant to the Secretary of State's decision".

29. In line with this requirement of the MCAA and the Defra (2021) draft guidance, the methodology adopted herein takes the following steps, following a similar process to HRA derogation:

- Step 1 – summarise the Project need and its objectives in order to allow the assessment (Step 3) to determine whether the OMoP achieve the same overall objective(s)/outcome;
- Step 2 – identify the risk and extent of hindering the conservation objectives of the CSCB MCZ in order to allow the assessment (Step 5) to determine whether the OMoP are less damaging to the MCZ.
- Step 3 – produce a long list of potential OMoP, including different location, using different routes across the MCZ, changes to scale/size or using a different method[3]. These OMoP are then screened in terms of whether they meet the objectives of the Projects, to produce a short list of OMoP that meet the Project objectives.
- Step 4 – consider whether any short-listed potential OMoP identified in Step 3 are feasible (financially, legally and technically).
- Step 5 – consider whether any feasible OMoP identified in Step 4 would have a lesser effect on the MCZ conservation objectives.

4.3 Step 1: Project Need and Objectives

4.3.1 Need for SEP and DEP

30. The key drivers underpinning the need for offshore wind power projects are:
    - The need to reduce greenhouse gas emissions;
    - The need for energy security; and
    - The urgency of the need for low carbon electricity capacity.

4.3.1.1 The Need to Reduce Greenhouse Gas Emissions

31. The commitments made by the UK and international governments at the United Nations Conference of the Parties 21 (COP21) to the Framework Convention on Climate Change in Paris in 2015 (the Paris Agreement) were – to limit global temperature increase to below 2°C (preferably 1.5°C) as ratified by the UK foreign secretary in November 2016 and implemented through the fifth UK Carbon Budget. This commits the UK to a 57% reduction in carbon emissions by 2032, compared to emission levels in 1990 (BEIS, 2020b). Most recently, in line with the recommendation of the CCC and the sixth Carbon Budget, the UK government has announced that it will set the world's most ambitious climate change target into law to reduce emissions by 78% by 2035 compared to 1990 levels (BEIS, 2021c).

[3] The Defra 2021 draft guidance also refers to OMoP including changes to timing, however as this derogation case is referring to a long term effect, timing is not applicable.

32. In 2019, the Sector Deal reported total UK greenhouse gas emissions were provisionally 45.2% lower than in 1990 and 3.6% lower than 2018 (BEIS, 2020b). This is mainly as a result of changes in the fuel mix used for electricity generation, away from coal and towards renewables. However, as discussed above, the world is not currently on track to meet the long-term temperature goal set out in the Paris Agreement, with a 2.7ºC increase predicted following COP26 (CCC, 2021a).

33. The Queen's Speech on 19 December 2019 (HM Government, 2019) confirmed that Government will continue to take steps to meet the world-leading target of net zero greenhouse gas emissions by 2050. The CCC report on recommendations for achieving net zero states that 75GW of offshore wind could be required to reach net zero by 2050 (CCC, 2019a). The British Energy Security Strategy (BEIS, 2022a) provides a target of 50GW of operational offshore wind farms by 2030.

34. NPS EN-1 (DECC, 2011) reflects the UK commitment to the legally binding targets to cut greenhouse gas emissions and recognises that future large-scale renewable energy generation is likely to come from offshore wind projects. NPS EN-1 (Paragraph 3.3.15) reinforces the need for new electricity NSIPs and their urgency: *"In order to secure energy supplies that enable us to meet our obligations for 2050, there is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible, and certainly in the next 10 to 15 years* [at the time of writing in 2011]*, given the crucial role of electricity as the UK decarbonises its energy sector."*

35. This is reiterated in the draft NPS EN-1 (BEIS, 2021a) which states *"There is an urgent need for new electricity generating capacity to meet our energy objectives."*

36. The UK Government is required to publish a Climate Change Risk Assessment (CCRA) every five years under the 2008 Climate Change Act. The CCRA3 was published in 2022 (Defra, 2022).

37. The global average surface temperature over the decade between 2006-2015 was 0.87°C (+/-0.12°C) warmer than the pre-industrial period (considered to be 1850-1900) with an average annual temperature increase for England of 1°C (Committee on Climate Change (CCC), 2019a).

38. The 2021 Progress Report (CCC, 2021b) predicts that by 2050, summer temperatures in the UK are expected to increase by around 1.5°C above the 1981 – 2000 baseline (with a 0ºC – 3ºC uncertainty range). However based on policies as of the end of the Conference of Parties (COP) 26, the CCC (2021b) states a global temperature increase of around 2.7°C by 2050 is expected.

39. Independent assessment by a consortium of experts led by the University of Exeter has been completed in 2021 to inform this process. Sustainability West Midlands (2021) provides the summary of climate risks in England and lists the following high magnitude risks which require action now:
    - Impacts of climate change on the natural environment, including terrestrial, freshwater, coastal and marine species, forests and agriculture;

- An increase in the range, quantities and consequences of pests, pathogens and invasive species, negatively affecting terrestrial, freshwater and marine priority habitats species, forestry and agriculture;
- More frequent flooding and coastal erosion, causing damage to our infrastructure services, including energy, transport, water and information and communication technologies;
- A reduction in public water supplies due to increasing periods of water scarcity;
- The impact of extreme temperatures, high winds and lightning on the transport network;
- The impact of increasing high temperatures on people's health and wellbeing and changes in household energy demand due to seasonal temperature changes;
- Increased severity and frequency of flooding of homes, communities and businesses;
- The viability of coastal communities and the impact on coastal businesses due to sea level rise, coastal flooding and erosion;
- Disruption to the delivery of health and social care services due to a greater frequency of extreme weather;
- Damage to our cultural heritage assets as a result of temperature, precipitation, groundwater and landscape changes; and
- Impacts internationally that may affect the UK, such as risks to food availability, safety and security, risks to international law and governance from climate change that will affect the UK, international trade routes, public health and the multiplication of risks across systems and geographies.

40. The international and UK legislation that has been put in place to secure a reduction in emissions is further outlined in **ES Chapter 2 Policy and Legislative Context** (document reference 6.1.2).

41. SEP and DEP will each have an export capacity of greater than 100 megawatts (MW) and in the context of reductions in the capacity of the UK to generate electricity (total UK generating capacity has fallen from 85GW in 2009 to 75.8GW in 2021 – BEIS, 2022b), will therefore contribute to meeting the UK Government's ambitious target of 50GW of generating offshore wind energy by 2030. This will help to alleviate the risks associated with climate change such as flooding, water supply shortages and risks to health, food security and productivity and trade. SEP and DEP will provide an important element for the UK to achieve the target of net zero greenhouse gas emissions by 2050.

4.3.1.2 The Need for Energy Security

42. Energy security is about ensuring secure, reliable, uninterrupted supplies to consumers, and having a system that can effectively and efficiently respond and adapt to changes and shocks. It is made up of three characteristics: flexibility, adequacy and resilience (BEIS, 2017).

43. The Overarching National Policy Statement for Energy (NPS EN-1) (Department of Energy and Climate Change (DECC, 2011) sets out national policy for energy infrastructure. DECC (2011) stated that within the next forty years (at the time of writing in 2011) the need to electrify large parts of the industrial and domestic heat and transport sectors could double demand for electricity. To meet emissions targets, the electricity being consumed will need to be almost exclusively from low carbon sources. This shows that energy security has been a key concern in the UK for a number of years, however the issue has recently been exacerbated by recent sanctions on Russian gas. As a result, European gas prices have increased by more than 200% from 2021 to 2022. This has led to extreme increases in the cost of living, with gas providing a key source of energy to the UK. (BEIS, 2022a).

44. The draft EN-1 (BEIS, 2021a) states that electrification to reduce emissions in transport, heating and industry could lead to more than 50% of final energy demand being met by electricity in 2050, up from 17% in 2019, representing a doubling in demand for electricity.

45. NPS EN-1 (DECC, 2011) recognises that it is critical that the UK continues to have secure and reliable supplies of electricity as the transition to a low carbon economy is made. EN-1 also states that the Secretary of State should "*give substantial weight to the contribution which projects would make towards satisfying this need*" (paragraph 3.2.3). The draft NPS EN-1 (BEIS, 2021a) states "*we need a diverse mix of electricity infrastructure to come forward, so that we can deliver a secure, reliable, affordable, and net zero consistent system in 2050 for a wide range of demand, decarbonisation, and technology scenarios*".

46. The UK Government recognises the importance to businesses and households of access to an affordable, secure and sustainable supply of energy:
"Where applicable, national objectives with regard to reducing energy import dependency from third countries, for the purpose of increasing the resilience of regional and national energy systems" (The UK's Draft Integrated National Energy and Climate Plan - BEIS, 2019a).

47. BEIS (2022a) provides the UK Energy Statistics for 2021. Similarly to 2020, energy consumption remained low in comparison to pre-pandemic levels, increasing from April as restrictions eased. Overall net energy imports increased by 8% in 2021, which, combined with a drop in exports increased the UK's net import dependency to 38%. Total energy production was down 14% from 2020 with oil and gas output reduced by 17%. Electricity demand in the UK is likely to rise during the 2020s as a greater proportion of the heat and transportation systems electrify.

48. Draft NPS EN-1 (BEIS, 2021a) states that to ensure the UK's supply of energy remains secure, reliable, affordable, and consistent with meeting the target of net zero by 2050, decarbonisation of the energy system is required. Meeting these objectives necessitates a significant amount of energy infrastructure, both large and small-scale.

49. Reliance on global markets for imported energy leaves the UK vulnerable to spikes in world energy market prices, political pressure, and potentially physical supply disruptions and the knock-on effects of supply challenges in other countries. For example, a significant proportion of France's nuclear plants have been closed during 2022 due to planned maintenance, damage to facilities and very hot weather, and so the UK has been using more gas in power stations to supply France via 3GW of electricity interconnectors, so while interconnectors can help improve the UK's energy security, they can also place additional demand burden when other countries need them for their own security.

50. The UK Government recognised in "The UK's Draft Integrated National Energy and Climate Plan" the importance to businesses and households of access to an affordable, secure and sustainable supply of energy:

51. "Where applicable, national objectives with regard to reducing energy import dependency from third countries, for the purpose of increasing the resilience of regional and national energy systems" (BEIS, 2019a)."

52. The British Energy Security Strategy (BEIS, 2022a) therefore provides a target of 50GW of operational offshore wind farms by 2030 and recognises the need to fast track the consenting process in order to achieve this target and improve the UK's energy security.

53. In addition, the Strategy involves an "approach to reduce global reliance on Russian fossil fuels whilst pivoting towards clean, affordable energy" in the light of the invasion of Ukraine and concerns around reliance in Europe on Russian fuel imports, the constraining of which has led to significant global price rises for consumers. The strategy has been rapidly deployed with House of Commons Library research finding in August 2022 (House of Commons 2022) that:

54. "In 2021 imports from Russia made up 4% of gas used in the UK, 9% of oil and 27% of coal. In 2021, imports of gas, oil and coal from Russian to the UK were worth a combined £4.5 billion. According to Eurostat, in 2020, imports from Russia made up 39% of the gas used in the EU, 23% of oil imports and 46% of coal imports.

55. In June 2022, the fourth full month since the invasion, according to UK trade statistics, the UK Imported no oil, gas or coal from Russia. This was the third month in a row with no Russian gas imports, but the first month (since 2000 when this data is available back to) with no gas, oil or coal imports from Russia".

56. In a global market, this further reduction in supply from Russia continues the upward pressure on prices for energy in the UK and Europe even when the UK's supplies are more diversified.

57. In the context of the falling capacity of the UK to generate energy (as above) SEP and DEP will make a key contribution to security of supply providing, as part of a generation mix, clean and sustainable UK based generation, as energy demand increases within the UK.

4.3.1.3 The Urgency of the Need for Low Carbon Electricity Capacity

58. Established government policy in NPS EN-1 emphasises the urgency of the need for new (and particularly low carbon) electricity generating capacity in paragraph 3.3.15: "*In order to secure energy supplies that enable us to meet our obligations for 2050, there is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible, and certainly in the next 10 to 15 years, given the crucial role of electricity as the UK decarbonises its energy sector*".

59. Assessments in the NPS noted that the updated energy and emissions projections of the time assumed that electricity demand in 2025 would be approximately the same as it was at the time of publication in 2011. Electricity demand in 2011 was 374TWh as compared to 330TWh in 2021, due to a pandemic related depressing effect, as above. The NPS assumes however that demand will be higher by 2025 allowing for economic recovery from 2022 and the accelerating take up of electric vehicles and as evidenced in the sixth carbon budget (ibid), this assumption remains valid and as above BEIS (2022a) shows demand resumed its increasing trend from April 2021 when pandemic restrictions began to be lifted.

60. Resulting NPS policy, taking account of the need for excess or headroom capacity to account for the intermittency of renewable sources of generation, is that 113GW of total generation will be needed by 2025 of which 59GW would be new build, a breakdown of which is given (EN-1 paragraph 3.3.22) as being made up of: "*around 33 GW of the new capacity by 2025 would need to come from renewable sources to meet renewable energy commitments as set out in Section 3.4; it would be for industry to determine the exact mix of the remaining 26 GW of required new electricity capacity, acting within the strategic framework set by the Government; of these figures of 33 GW and 26 GW respectively, around 2 GW of renewables and 8 GW of non-renewable technologies are already under construction36. This leaves a balance of 18 GW to come from new non-renewable capacity; and the Government would like a significant proportion of this balance to be filled by new low carbon generation and believes that, in principle, new nuclear power should be free to contribute as much as possible towards meeting the need for around 18 GW of new non-renewable capacity by 2025*".

61. Draft NPS EN1 (2021) similarly sets out the range of generation options and concludes "*All the generating technologies mentioned above are urgently needed to meet the Government's energy objectives*".

62. Current generation capacity in the UK stands at only 76.6GW in 2021 (BEIS, 2022b) with recent increases being due to additional wind energy installations coming on stream. However, this remains significantly behind the 113GW supply capacity target established in NPS EN-1 and is an overall reduction in UK generating capacity from 2011 when NPS EN-1 was designated.

63. In relation to the subsidiary target of 33GW of new capacity in 2025 to come from renewables, with total UK renewable generation capacity standing at only 23.2GW, this target remains to be met, meaning that the contribution of SEP and DEP will be towards this will be of significant value.

64. Draft NPS EN-1 (BEIS, 2021a) states: "*Wind and solar are the lowest cost ways of generating electricity, helping reduce costs and providing a clean and secure source of electricity supply (as they are not reliant on fuel for generation)*." Analysis provided in BEIS (2020c) shows that a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar.

65. The UK has a world leading offshore wind sector and is well placed to benefit from further investment in renewables innovation to accelerate cost reduction. Large cost reductions have been realised, as the offshore wind industry has matured in recent years, as evidenced by the Contracts for Difference (CfD) process whereby the cost of offshore wind in the 2019 (third CfD) round dropped to approximately 30% lower than the second auction held in 2017, which in turn was approximately 50% lower than the original CfD auction round in 2015.

66. Developers are continuing to drive these cost reductions through technology development and new work processes. The development of SEP and DEP will contribute to this process. In addition, there are specific cost efficiencies from the combined development of SEP and DEP (for example the commitment for a shared onshore substation and shared export cable route, which optimises overall design and cost), as well as synergies with the existing Sheringham Shoal and Dudgeon offshore wind farms, particularly once all projects are operational.

4.3.1.4 Summary of the Need for the Project

67. There is a clear and urgent need for the development of SEP and DEP to help meet the UK Government target of 50GW of offshore wind installed capacity by 2030. SEP and DEP will each provide greater than 100MW of renewable energy capacity, with a maximum export capacity representing 4% of the current shortfall of the 2040 targets and 2.5% of the shortfall of the 2050 target (see details in the **Planning Statement** (document reference 9.1)). This will therefore contribute to meeting the urgent need for renewable electricity generation. SEP and DEP will make a substantial contribution to the achievement of national renewable energy targets towards net zero and to the UK's contribution to global efforts to reduce the effects of climate change.

68. The offshore wind farms will provide secure, reliable, affordable renewable energy supply in the UK for over 0.74 million homes. SEP and DEP would help the UK meet its Net Zero targets and significantly contribute to the economy by providing substantial investment locally and nationally, as well as employment and new infrastructure during all phases of the Projects. This will enhance the sustainable development of and bring benefits to, the region.

    The Need for the Project is set out in full in the **Planning Statement** (document reference 9.1).

4.3.2 SEP and DEP Project Objectives

Table 4-1: Project Objectives

ID	Objective	Basis for the Objective
1	**Decarbonisation:** To generate low carbon electricity from an offshore wind farm by 2030 in support of the UK target to generate 50GW of offshore wind power by 2030 and associated carbon reduction targets	The UK Government has committed to reducing its greenhouse gas emissions by at least 100% of 1990 levels (net zero) by 2050. This commitment is made through the Climate Change Act 2008 (2050 Target Amendment) Order 2019 which was brought into force in June 2019 in response to recommendations by the CCC (CCC, 2019b). The UK independent Climate Change Committee states that 75GW of offshore wind could be required to reach net zero by 2050 (CCC, 2019a). Legislation has committed the UK to achieving Net Zero emissions by 2050. Part 3 of NPS EN-1 (DECC 2011) states (3.3.15) *"In order to secure energy supplies that enable us to meet our obligations for 2050, there is an urgent need for new (and particularly low carbon) energy NSIPs to be brought forward as soon as possible, and certainly in the next 10 to 15 years, given the crucial role of electricity as the UK decarbonises its energy sector".* The British Energy Security Strategy (BEIS, 2022a) commits the UK to an ambition to deliver "50GW by 2030". Paragraph 3.3.21 of draft NPS EN-1 (BEIS 2021a) already committed the UK to "*an ambitious target to have 40GW of offshore wind capacity (including 1GW floating wind) by 2030*" as a key component in delivering energy security and net zero by 2050. This is likely to be amended in the final NPS to align with the British Energy Security Strategy (BEIS, 2022a). SEP and DEP will contribute to meeting UK Government objectives of delivering sustainable development to enable decarbonisation.
2	**Security of Supply:** To export electricity to the UK National Grid to support UK commitments for offshore wind generation and security of supply	Part 2 of NPS EN–1 notes that *"it is critical that the UK continues to have secure and reliable supplies of electricity as we make the transition to a low carbon economy"* and acknowledges the need for a diverse mix of technologies to ensure security of supply. This is reiterated in Part 2 of the draft NPS EN-1 which states *"Given the vital role of energy to economic prosperity and social well-being, it is important that our supply of energy remains secure, reliable and affordable."*

ID	Objective	Basis for the Objective
		This is reinforced by the British Energy Security Strategy (BEIS, 2022a), one of whose key purposes is to improve security from diverse sources of energy, with offshore wind playing a leading role. Paragraph 3.4.3 of NPS EN-1 states "*offshore wind is expected to provide the largest single contribution towards the 2020 renewable energy generation targets*".
3	**Optimisation:** To coordinate and optimise generation and export capacity within the constraints of available sites and onshore transmission infrastructure whilst delivering project skills, employment and investment benefits in the Norfolk area.	The 2017 Extension projects, which include SEP and DEP, were identified by TCE to provide an intermediate process between Rounds 3 and 4 to help achieve the urgent need for renewable energy and recognising that extensions to existing offshore wind farms are a proven way of efficiently developing more offshore generating capacity (The Crown Estate, undated). The Government's Offshore Transmission network Review begun in August 2020, under which SEP and DEP are a Pathfinder Project, had the objective "*To ensure that the transmission connections for offshore wind generation are delivered in the most appropriate way, considering the increased ambition for offshore wind to achieve net zero. This will be done with a view to finding the appropriate balance between environmental, social and economic costs".* Workstreams include the need to: - *"identify and implement changes to the existing regime to facilitate coordination in the short-medium term* - *assess the feasibility and costs/benefits of centrally delivered, enabling infrastructure to facilitate the connection of increased levels of offshore wind by 2030* - *explore early opportunities for coordination through pathfinder projects, considering regulatory flexibility to allow developers to test innovative approaches* - *focus primarily on projects expected to connect to the onshore network after 2025* *The long-term workstream will seek to:*

ID	Objective	Basis for the Objective
		- *"conduct a holistic review of the current offshore transmission regime and design and implement a new enduring regime that enables and incentivises coordination while seeking to minimise environmental, social, and economic costs* - *consider the role of multi-purpose hybrid interconnectors in meeting net zero through combining offshore wind connections with links to neighbouring markets and how the enduring offshore transmission regime can support the delivery of such projects* - *focus on projects expected to connect to the onshore network after 2030*" These Review workstreams find support in the Energy White Paper *"Powering our Net Zero Future"* of December 2020, one policy of which is *"To minimise the impact on local communities, we will implement a more efficient approach to connecting offshore generation to the mainland grid*". Under East Inshore and East Offshore Marine Plans (EIEOMP - Defra 2014) Objective 2 is: "*To support activities that create employment at all skill levels, taking account of the spatial and other requirements of activities in the East marine plan areas*", whilst EIEOMP Policy EC2 is that "*Proposals that provide additional employment benefits should be supported, particularly where these benefits have the potential to meet employment needs in localities close to the marine plan areas*". NPS EN-1 policy is that the SoS should take into account (4.1.3) "*potential benefits including its contribution to meeting the need for energy infrastructure, job creation and any long-term or wider benefits*" which may be (4.1.4) "*at national, regional and local levels*" and that (5.12.8) "*The [SoS] should consider any relevant positive provisions the developer has made or is proposing to make to mitigate impacts (for example through planning obligations) and any legacy benefits that may arise as well as any options for phasing development in relation to the socio-economic impacts*".

4.4 Step 2: Extent of Risk to the CSCB MCZ

4.4.1 Overview

69. The **Stage 1 CSCB MCZ Assessment** (document reference 5.6) concludes there will be no risk of hindering the conservation objectives of the CSCB MCZ and therefore this MCAA derogation case is provided without prejudice to that position. For the purposes of the MCAA derogation case, proposals are based on experience from other offshore wind farm projects (e.g. Hornsea Three (HOW03), Norfolk Vanguard and Norfolk Boreas), whereby if there is any potential risk to the conservation objectives, it is most likely to be associated with long term (project lifetime) habitat loss from external cable protection.

4.4.2 Relevant Parameters

70. The project design parameters that are of relevance to the effects outlined in **Section 4.4.3**, which could be considered in the assessment of OMoP are detailed below.

71. Changes (i.e. alternatives) to these parameters are considered in **Sections 4.5.3** and **4.6.2**. Any other element of the project design parameters would have no bearing on the long term effects on the CSCB MCZ.

72. The worst-case scenario for external cable protection in the MCZ is for an overall total of 1,800m^2, defined as:

- 600m^2 of external cable protection for unburied cables per Project. This is based on 100m length of protection per cable and a width of 6m (i.e. 600m^2 per cable). There would be one offshore export cable per Project, resulting in 1,200m^2 total for SEP and DEP combined. This could be installed anywhere along the length of the offshore export cable corridor inside the MCZ up to the approach to the HDD exit point (see below).
- At the HDD exit point in the subtidal, in the transition zone between where the ducts exit the sea bed and the point at which it is possible for the burial tool to start the process of burying the cables. External cable protection may be required along up to 100m of each of the cables i.e. a total length of 200m for both cables. The cable protection would likely be in the form of removable 8 tonne rock bags up to 3m wide. The sea bed footprint of the installed rock bags would therefore be up to 600m^2 for both cables in total.

4.4.3 Summary of Assessment of Effects

73. The Applicant is committed to minimising external cable protection in the CSCB MCZ and has sought to refine the quantities required through the measures outlined in the **Stage 1 CSCB MCZ Assessment** (document reference 5.6) and **Outline CSCB MCZ Cable Specification and Installation Monitoring Plan (CSIMP)** (document reference 9.7). As such, external cable protection will only be used where deemed to be essential, in the instance that adequate burial is not possible for any section of the route through the MCZ. It is noted that the existing Sheringham Shoal Offshore Wind Farm and Dudgeon Offshore Wind Farm export cables did not require any external cable protection in what is now the MCZ and these cables have not had to undergo any reburial or repair operations to date.

74. As secured through the **Outline CSCB MCZ CSIMP**, all external cable protection used within the CSCB MCZ will be designed to be removable on decommissioning (i.e. no loose rock type systems will be used), although the requirement for removal will be agreed with stakeholders and regulators at the time. Detail describing the feasibility of, and commitment to, removing external cable protection is provided within **Appendix 3 Decommissioning Feasibility Study** (document reference 9.7.3) of the **Outline CSCB MCZ CSIMP** (document reference 9.7)

75. As summarised in **Table 3-1**, the SEP and DEP offshore export cables have potential to impact on the subtidal coarse sediment, subtidal mixed sediments and subtidal sand features of the MCZ.

76. The Applicant has committed to using HDD at the landfall, with an exit point which avoids the area of outcropping chalk/rock in the nearshore.

77. The **Stage 1 CSCB MCZ Assessment** (document reference 5.6) identifies the following biological attributes of protected features, of relevance to long term habitat loss:

- Distribution: presence and spatial distribution of biological communities
- Structure and function: presence and abundance of key structural and influential species
- Structure: species composition of component communities

78. The installation of external export cable protection on sediment habitats will potentially result in localised mortality of associated biological communities and their replacement, over time, by a community with a different species composition and different key structural and influential species.

79. All sediment biotopes, including those recorded in the SEP and DEP offshore export cable corridor, and those identified in Natural England (2018) as being represented within CSCB MCZ sediment habitat features, have high sensitivity to physical change to another sea bed type, with no resistance and very low resilience. However, given the very small area of long-term sediment habitat loss, the presence, spatial distribution and characteristics of biological communities will largely be maintained across the CSCB MCZ. This scale of impact (0.0006% of the MCZ and a worst-case loss of 0.01% of the subtidal sand feature if all habitat loss were to this feature alone) is unlikely to alter the wider value of the feature, such as providing a nursery for fish and feeding ground for seabirds.

80. In addition, the **Stage 1 CSCB MCZ Assessment** (document reference 5.6) assesses the following impacts on the form and function of the physical attributes of protected features, of relevance to long term habitat loss:

- Extent and distribution
- Structure: sediment composition and distribution
- Supporting processes: energy / exposure

81. The extent, distribution and structure of sediment features will largely be maintained across the CSCB MCZ. Subtidal coarse sediment, sand, and mixed sediment sea bed would be replaced by, or buried beneath, external export cable protection in localised and discrete areas (approximately 0.0007% of the estimated spatial extent of broadscale marine sediment and habitat features in the MCZ and a worst-case loss of 0.01% of the subtidal sand feature if all habitat loss were to this feature alone).

82. External cable protection would sit up to 0.5m proud of the original sea bed level and will locally change the exposure of adjacent areas to tidal currents and wave action, and potentially cause localised scour effects. Associated habitat loss through changes to sediment composition would be restricted to areas of mobile sediments (subtidal sand), although exposure changes may have more subtle effects on the biological communities associated with affected adjacent sediment habitats. However, any such impacts would be highly localised and within the estimated worst-case footprint of habitat loss. Following removal of external cable protection, the local energy environment would return to ambient conditions within natural variability.

4.5 Step 3: Long List of OMoP for SEP and DEP

4.5.1 Do Nothing

83. While the draft Defra 2021 compensatory measures guidance advised that the "do nothing" option should be considered, it acknowledges this would rarely be a true alternative means of proceeding:

"It is unlikely in most cases that the 'do nothing' option (i.e. no proposed activity) would be an acceptable alternative as it would not deliver the same overall objective as 'the activity'. However, it is useful to provide a comparison for other alternatives and to act as a baseline against which public benefits can be assessed. Where it is most likely to be an option is where no or limited tangible public benefit can be demonstrated."

84. The do nothing scenario would not enable SEP and DEP to contribute to the range of government legislation and policies which promote the importance of developing offshore wind farms. Of particular note, the target for 50GW of installed capacity of offshore wind by 2030 requires the vast majority of offshore wind farms currently in planning to be consented. There is currently approximately 4.2GW in the planning stages (i.e. pre-submission and post-submission). Approximately 40.1GW is in pre-planning which includes 8GW, 25GW and 4GW of Round 4, Scotwind and Celtic Sea offshore wind farms respectively. With respect to Scotwind, the sectoral marine plan only assessed 10GW of capacity in its plan-level HRA whilst the Celtic Sea offshore wind farms have yet to proceed through the plan-level HRA stage. Therefore, there remain significant challenges in achieving the 50GW target by 2030.

85. Given the need for the Projects, as set out in **Section 4.3.1** and expanded in the **Section 5** Clear Public Benefits, the alternative of not developing an offshore wind farm would clearly not satisfy any of the project objectives outlined in **Section 4.3.2**. The do nothing scenario is therefore not considered further.

4.5.2 At Another Location

4.5.2.1 Different location for the Projects

86. The **Habitats Regulations Derogation: Provision of Evidence** (document reference 5.5) provides an assessment of other locations for SEP and DEP and determines that there are no feasible other locations which would satisfy the project objectives. In summary, the 2017 Extension projects, which include SEP and DEP, were identified by TCE to provide an intermediate process between Rounds 3 and 4 to help achieve the 2030 target, recognising that extensions to existing offshore wind farms are a proven way of efficiently developing more offshore generating capacity (The Crown Estate, undated). There is therefore an urgent need for SEP and DEP and alternative offshore wind farm locations would not deliver the project objectives.

87. In addition, following the completion of the National Grid's Connection and Infrastructure Options Note (CION), National Grid made the Applicant a grid connection offer in April 2019 for connection at Norwich Main National Grid Substation, which would accommodate both SEP and DEP. This offer was accepted by the Applicant in May 2019, and therefore the location of Norwich Main substation formed the basis for the landfall and cable corridor selection process. An alternative grid connection location is therefore not considered further.

4.5.2.2 Different route across the site

88. An alternative offshore export cable corridor would in theory satisfy the project objectives and therefore the feasibility of this OMoP is considered in Step 4 (**Section 4.6**).

4.5.3 In Another Manner

89. As discussed in **Section 4.4.2** the parameters of relevance to the OMoP relate specifically to cable protection, including:

- Changes to scale/size
  - Reduce the number of export cables;
  - Reduce the length and width of cable protection in the MCZ;
- Changes to method
  - Bury all cable in the MCZ; and
  - Use no cable protection on surface laid cable which cannot be buried within the MCZ.

90. The number of cables has been reduced as far as possible with only one export cable per Project. Therefore, this OMoP is not considered further.

91. The remaining OMoP listed above, would in theory satisfy the project objectives and therefore the feasibility of these are considered in Step 4 (**Section 4.6**).

4.6 Step 4: Feasibility of OMoP for SEP and DEP

4.6.1 At Another Location - Different Cable Corridor Route

92. ES **Chapter 3 Site Selection and Assessment of Alternatives** (document reference 6.1.3) describes the robust process undertaken to select the offshore cable corridor and landfall for SEP and DEP, in accordance with The Crown Estate (2019b) Cable Route Protocol.

93. This process included identification of a wide landfall search area from The Wash to Happisburgh, in order to connect to the Norwich Main National Grid Substation. This search area included options outside the CSCB MCZ.

94. The options were refined through a process of constraints mapping, site walkover and a series of workshops to understand the risks and challenges associated with different cable corridor and landfall options to rate and assess the different options. The evaluation included the following elements:
- Environmental sensitivities and designations;
- Length of the export cable corridor (offshore & onshore);
- Crossing of offshore utilities and cables; and
- Technical design and feasibility of the landfall location.

95. Of particular relevance is The Wash and North Norfolk Coast Special Area of Conservation (SAC) as it would be impossible to route to the west of the CSCB MCZ without cabling through this SAC. During a meeting with Natural England in January 2018, it was advised that a route close to the existing Dudgeon offshore wind farm export cables, passing through mixed subtidal sediment habitats, was preferred over any route through The Wash and North Norfolk Coast SAC, due to the potential impacts on Annex I habitats. As such it was therefore decided, as part of the response to consultation carried out not to consider an export cable route through the SAC and therefore to exclude this area from the landfall search area. This approach is in accordance with The Crown Estate (2019b) Cable Route Protocol.

96. The remaining areas of the landfall search area were assessed as to whether they would be suitable for landfall and the cable corridor, considering the distance from the wind farm sites, the extent of additional infrastructure that would be required, technical limitations and environmental sensitivities. Significant urban or otherwise built up areas were also excluded.

97. The following areas were identified as potential landfall locations:

- Happisburgh (outside the CSCB MCZ);

  Weybourne (within the CSCB MCZ); and

  Bacton (within the CSCB MCZ).

4.6.1.1 Happisburgh Landfall Option

98. The offshore export cable corridor search area for Happisburgh which was not taken forward as an option at EIA scoping stage could provide a cable corridor that avoids both the MCZ and SAC, however it is not a feasible alternative. The route to a landfall in the Happisburgh area is considerably longer than the routes to the other landfall options, with the nearshore section from the SEP wind farm site to a landfall at Happisburgh being over double the length required to the selected Weybourne landfall (approximately 34km direct to Happisburgh, compared to approximately 17km direct to Weybourne). A longer cable corridor would significantly increase energy losses in comparison to the other routes. In addition, there is an increased number of records of Annex I *Sabellaria spinulosa* reef in the area around Happisburgh, which would make the required mitigation of micro-siting to avoid impacts more challenging and increase the potential for impacts on benthic habitats.

99. A Happisburgh landfall would also add onshore length to the total export cable corridor route, therefore the footprint of potential impacts would be significantly larger for the overall development, onshore and offshore.

100. In addition, with the Norfolk Boreas and Norfolk Vanguard cable routes and landfall at Happisburgh, it is considered that there is unlikely to be sufficient room to accommodate another landfall, due to the number of properties on the frontage along the stretch of coastline south of the CSCB MCZ to Eccles on Sea. In addition, a landfall connection at Happisburgh would require multiple crossings of offshore gas and chemical pipelines associated with the Bacton Gas Terminal (15 in total). There are also significant rates of erosion at Happisburgh, with the Shoreline Management Plan policy being for 'Managed Realignment' over the next 100 years. There are substantial stakeholder concerns in this regard and a dedicated community action group exists to try and reduce the erosion.

101. For all the above reasons, Happisburgh is not a feasible OMoP.

4.6.1.2 Weybourne and Bacton Landfall Options

102. Following further consideration of environmental and engineering constraints and the receipt of the Scoping Opinion (PINS, 2019), Weybourne was identified as the preferred landfall option for the offshore export cable corridor. The Weybourne landfall and offshore export cable corridor was selected on account of the following:

- Provides a more direct route from the wind farm sites to landfall, therefore reducing the overall impacts from cable installation;

- Technical (i.e. engineering and design) advantages;
- Considerably flatter topography (8m cliffs at Weybourne compared to between 15 and 32m high cliffs at Bacton);
- Enables avoidance of the subtidal outcropping chalk Cromer Shoal Chalk Beds MCZ feature;
- Good access using existing roads (Bacton would require a new access road);
- Avoids the SSSI and any interaction with National Nature Reserves (NNR) along the Norfolk coast (e.g. Mundesley Cliffs SSSI and Paston Great Barn NNR);
- Avoids the Bacton Sandscaping Scheme area, so there will be no interference with that scheme or potential cumulative impacts;
- Located close to the existing Dudgeon and Sheringham Shoal HDD landfalls for which considerable experience, data and lessons learnt are available resulting in a high level of confidence in the engineering feasibility of landfall and HDD works at this location;
- Private land along the beach at Weybourne allows for duct preparation (as was used for example during the construction of the Dudgeon offshore wind farm); and
- Avoids Happisburgh impacts on shoreline management, coastal properties and *Sabellaria* reef.

103. While it is clear the Weybourne option is preferable for a range of factors, Bacton is in theory feasible and the effects on the MCZ are considered in Step 5 (**Section 4.7**).

4.6.2 In Another Manner

4.6.2.1 Reduce the area of cable protection

104. The offshore cable corridor takes the shortest, most direct route possible from the SEP and DEP wind farm sites to landfall, minimising the length of the export cable corridor in the MCZ and therefore minimising the area of associated external cable protection.

105. As discussed above, the offshore cable corridor selected has the advantage of being parallel to the existing Dudgeon offshore wind farm export cables where cables were installed without the need for external cable protection. This increases confidence in the ability to successfully bury the SEP and DEP cables, since site surveys show that the sediment characteristics are similar to those on the Dudgeon cable route.

106. The offshore cable corridor has also been sited to completely avoid the need for any cable crossings (which would require the use of external cable protection) in the CSCB MCZ.

107. External cable protection will only be considered if the planned cable protection methodology through cable burial fails to achieve an acceptable depth. The Applicant has undertaken a preliminary cable burial risk assessment (CBRA) (PACE Geotechnics, 2020) (provided as Appendix 2 of the **Outline CSCB MCZ CSIMP** (document reference 9.7)) in order to inform the required worst-case scenario parameters for SEP and DEP cable protection. This identified that up to 100m of external cable protection for potential unburied cables (6m wide with a total footprint of 1,200m^2) may be required. In addition, where the offshore export cables exit onto the sea bed from the HDD at the landfall, 100m of external cable protection may be placed in the transition zone along each of the cables (3m wide with a total footprint of 600m^2).

4.6.2.2 Bury all cable

108. Due to the findings of the CBRA (PACE Geotechnics, 2020), it is not feasible to commit to burying all of the offshore export cable at the pre-consent stage. However as discussed above, cable protection will only be considered if the planned cable protection methodology through cable burial fails to achieve an acceptable depth.

4.6.2.3 Use no cable protection

109. Surface laid cables without protection would be at risk of snagging, such as with anchors and fishing gear which would represent a risk to health and safety. In addition, this would risk damage to cables and therefore disruption to electricity supply from SEP and DEP to the National Grid. This OMoP is therefore unfeasible.

4.7 Step 5: Assessment of Effects of OMoP

110. As discussed in **Section 4.6.1.2**, while landfall at Bacton may in theory be feasible, the effects on the CSCB MCZ would be greater than the selected landfall location at Weybourne.

111. Natural England advised that whilst it would be preferable for the export cable corridor to avoid the CSCB MCZ, if this were not possible as has been demonstrated above, the area should be fully characterised during the assessment phase to determine the presence of the features of concern and the potential to avoid or minimise impacts on them.

112. In response to this advice, detailed habitat mapping has been undertaken, as presented in the **Stage 1 CSCB MCZ Assessment** (document reference 5.6), and a cable corridor has been selected which enables the outcropping chalk feature of the MCZ to be avoided through the use of Horizontal Directional Drilling (HDD). There is high confidence in the ability to use a long distance HDD technique at the Weybourne landfall to completely avoid the subtidal outcropping chalk MCZ feature as this is in a proven location for works of this nature (i.e. successful HDD works have already been carried out for both Dudgeon and Sheringham Shoal offshore wind farms). At Bacton, it would not be possible to HDD under the full extent of the chalk feature (Gardline, 2019) and therefore the Bacton landfall OMoP would have a greater risk to the conservation objectives of the CSCB MCZ than the selected Weybourne landfall and cable corridor.

4.8 OMoP Summary

113. The information presented in this document demonstrates the careful and extensive consideration of OMoP that has been undertaken by the Applicant in ensuring the risks to the conservation objectives of the CSCB MCZ are minimised as far as possible.

114. No feasible other locations, scale or methods are available to deliver the project objectives with a lesser effect on the National Site Network, in comparison to the selected cable route and cable protection parameters included in the project envelope for SEP and DEP.

5 CLEAR PUBLIC BENEFITS

5.1 Introduction

115. The Need for the Project, outlined in **Section 4.3**, demonstrates the public benefit of SEP and DEP. The various public benefits are discussed further in this section.

5.2 Approach to Assessing Clear Public Benefit

116. There is no detailed guidance on assessing public benefit in relation to the MCAA, however the MMO (2013) states: "*In determining 'public benefit' the MMO will consider benefits at a national, regional or local level. Applications for activities that are of solely private benefit would not be considered to deliver a benefit to the public*".

117. Whilst no guidance exists for assessing public benefit in relation to the MCAA, it is recognised that there are obvious parallels with HRA guidance with respect to assessing IROPI. In accordance with the draft Defra guidance (Defra, 2021) which considers MCZs alongside other site designations as part of a "*ecologically coherent network of MPAs [Marine Protected Areas]*" and states that "*the impact of a development within an MPA should be considered in a consistent way*", it is considered appropriate to refer to HRA guidance on IROPI as a proxy for assessing clear public benefit with respect to the MCAA.

118. BEIS (2020d) summarised the following key principles (as set out in guidance) in defining the IROPI case for Hornsea Project Three in relation to HRA:

- Imperative: Urgency and importance: There would usually be urgency to the objective(s) and it must be considered "indispensable" or "essential" (i.e. imperative). In practical terms, this can be evidenced where 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.
- Public interest: The interest must be a public rather than a solely private interest (although a private interest can coincide with delivery of a public objective).

- Long-term: The interest would generally be long-term; short-term interests are unlikely to be regarded as overriding because the conservation objectives of the Habitats and Birds Directives are long term interests.
- Overriding: The public interest of development must be greater than the public interest of conservation of the relevant habitats site(s).

119. The Need for the Project discussed in **Section 4.3** (and more fully in the Planning Statement) is clearly supported by a range of national and international policy and legislation, including NPS policy which explicitly establishes that "there is an urgent need for new (and particularly low carbon) energy" (paragraph 3.3.15 of NPS EN-1). **Section 5.3.1** provides consideration of the public benefits at a national, regional and local level, whilst also recognising the public benefits of combating climate change are also important at a global level.

120. Section 126(7)(b) of the MCAA requires that the public benefit clearly outweighs the risk of damage to the environment. **Section 5.3.2** provides consideration of the public benefit in comparison to the potential damage to the CSCB MCZ.

5.3 Clear Public Benefits of SEP and DEP

5.3.1 Public Benefit of SEP and DEP

121. The following sections outline the essential public benefits of SEP and DEP.

5.3.1.1 Climate Change Benefits

122. The CCC (2021b) states a global temperature increase of around 2.7°C by 2050 is expected (an increase between 1 and 3°C above the 1981 - 2000 baseline). DECC (2011) predicted that a continuation of global emission trends could lead average global temperatures to rise by up to 6°C by the end of this century. Further predictions, based on a 'business-as-usual' greenhouse gas concentration scenario, suggest global air temperatures could rise up to 5°C above pre-industrial levels by 2100 (Climate Science Special Report (CSSR), 2017). The potential impacts associated with such a global temperature rise include impacts on human health and safety.

123. BEIS (2019a) outlines the following potential health risks resulting from climate change:

- Existing health problems become worse as temperatures increase.
- Malnutrition could become more widespread as crop yields are affected by increased drought conditions in some regions, leading to reduced food production.
- Warmer temperatures could increase the range over which disease-carrying insects are able to survive and thrive.
- Vulnerable people will be at risk of increased heat exposure and the number of deaths due to temperature extremes is expected to increase in the future (although in the long term there will likely be fewer health problems related to cold temperatures).

- Decreasing food production, an increase in health issues associated with climate change, and more extreme weather, will slow economic growth, making it increasingly difficult to reduce poverty.

124. The World Meteorological Organization (WMO) reported that between 2001 and 2010 extreme weather events caused more than 370,000 deaths worldwide (including a large increase in heatwave deaths from 6,000 to 136,000) – 20% higher than the previous decade (in BEIS, 2019b).

125. In the UK, floods and droughts have had significant health impacts, including fatalities in recent years. In addition, health impacts as a result of climate change are likely to be more far-reaching than the immediate dangers of flooding. Climate change effects such as flooding have potential to impact on mental health and provide other indirect impacts as a result of disruption to critical supplies of utilities such as electricity and water (UK Health Security Agency, 2022).

126. The UK CCC (2017) reported that 2016 was the hottest year on record, which represents the fifth time in the 21st century that a new record high annual temperature has been set (along with 2005, 2010, 2014, and 2015) (National Oceanographic and Atmospheric Administration (NOAA), 2016). At the time, 2019 was the second hottest year globally since records began in 1880 (Copernicus Climate Change Service, 2020) and now 2020 is tied with 2016 as the hottest year on record, globally (National Aeronautics and Space Administration (NASA), 2021).

127. Increasing global temperatures is predicted to increase frequency of extreme weather events such as floods and drought and reduced food supplies.

128. The frequency and extent of extreme weather events are increasing around the world and have been seen in the UK, with heat waves becoming more frequent and longer lasting, as well as an increase in intense, heavy rainfall causing flood events.

129. Should global temperatures rise by 2°C above the pre-industrial average, the UK could see a 30% decrease in river flows during ‘dry’ periods and a 5-20% increase in river flows during ‘wet’ periods. In addition, between 700 and 1,000 more heat-related deaths are predicted per year in South-East England (BEIS, 2019b).

130. Climate change has been greatly affecting coastal areas in the UK in recent years. This includes the Norfolk coast, where coastal erosion in certain locations has become a greater problem now compared to previous years, due to a combination of increasing storm frequency and the already sensitive nature of the Norfolk coast to such erosion.

131. Increased temperatures, changes to rainfall patterns, increased prevalence of agricultural pests and an increased risk of extreme weather events is also predicted to reduce the production of major food crops. This would result in an increasing gap between food demand and supply. Since trade networks are increasingly global, the effects of extreme weather events in one part of the world will affect food supply in another. For example, floods or droughts that damage crops in Eastern Europe or the US can directly affect the cost and availability of food in the UK (DECC, 2019).

132. Generating and harnessing energy from low carbon, renewable sources, such as offshore wind, is one of the solutions available to substantially reduce carbon emissions and thereby mitigate all the above climate impacts. SEP and DEP would make a significant contribution both to the achievement of UK decarbonisation targets and to global commitments to mitigating climate change.

133. The switch to renewable sources of energy has both air quality and associated human health and safety benefits. A recent study has demonstrated the huge beneficial impacts on human health from decarbonisation, stating that "*Our estimates suggest that overall around 3.5 million or so premature deaths from air pollution worldwide could be prevented annually from phasing out fossil fuels at today's population. If all sources of air pollution from human activities could be eliminated, our estimates show that more than five million premature deaths from air pollution would be prevented annually*." (LSHTM, 2019).

134. SEP and DEP will make a significant contribution to the achievement of both the national renewable energy targets and to the UK's contribution to global efforts to reduce the effects of climate change. The Climate Change Act 2008 sets a UK target for at least a 100% reduction of greenhouse gas emissions (compared to 1990 levels) by 2050. This ambitious 'net zero' target will only be met by the crucial contribution from the offshore wind industry.

135. SEP and DEP have a design life of approximately 40 years, after which both offshore wind farms may be repowered (subject to the necessary approvals). SEP and DEP would contribute to reaching national targets on CO_2 reduction to net zero greenhouse gas emissions by 2050 and renewable energy production growth, with the potential to each deliver greater than 100MW of clean, renewable energy.

5.3.1.2 Public Electricity Supply Benefits

136. In addition to their contribution to offsetting carbon emissions, SEP and DEP have the potential to power over 0.74 million UK homes per annum with clean, renewable and low cost electricity.

137. As discussed in **Section 4.3.1.2,** decarbonisation of the UK energy supply chain, sanctions on Russia, and increasing electricity demand results in a significant deficit in UK electricity supply compared with demand and therefore there is a clear public benefit inherent in the creation of new electricity supply capacity, such as will be provided by SEP and DEP.

138. In order to help meet the targets described in the sections above, renewable energy needs to be affordable. The UK has a world leading offshore wind sector and is well placed to benefit from further investment in renewables innovation to accelerate cost reduction. The Government, in partnership with the Research Councils and Innovate UK, expects to invest around £177 million to further reduce the cost of renewables, including innovation in offshore wind turbine blade technology and foundations.

139. Through offshore wind developer-led innovation there has been a significant reduction in the levelized cost of energy in recent years. The Clean Growth Strategy (BEIS, 2017) indicates that the costs of offshore wind have decreased significantly (50% fall since 2015) which will help to fight fuel poverty (ORE Catapult, 2017a). UK offshore wind industry achieved a 'strike price' (the minimum price developers will be paid for electricity) as low as £39.65/MWh in the government's latest CfD auction in 2019. That price is 30% lower than the lowest strike price seen in the second CfD auction in 2017.

140. In the Clean Growth Strategy (BEIS, 2017), the UK Government set out a plan to decarbonise all sectors of the UK economy via investment in electrification of transport, heating and industry. through the 2020s, including innovation in the power sector and renewables. Additionally, in March 2019 the UK offshore wind sector committed to an Offshore Wind Sector Deal (BEIS, 2019b) which reinforces the aims of the UK for clean growth. The UK has a world leading offshore wind sector and is well placed to benefit from further investment in renewables innovation to accelerate cost reduction. The Clean Growth Strategy (BEIS, 2017) indicates that costs of offshore wind projects have decreased significantly (50% fall since 2015) which will help to reduce energy costs to the end user.

141. Developers are continuing to drive these cost reductions through technology development and new work processes. The development of SEP and DEP will contribute to this process. In addition, there are specific cost efficiencies from the combined development of SEP and DEP (for example, the commitment for a shared onshore substation and shared export cable route, which optimises overall design and cost), as well as synergies with the existing Sheringham Shoal and Dudgeon offshore wind farms, particularly once all projects are operational. SEP and DEP will continue to drive technology and development costs down.

142. Unless renewable capacity is enhanced through the build out of projects such as SEP and DEP neither suppliers, regulators nor government will have the ability to pass on the public benefit of cost reductions that flow from increased levels of electricity generation in the form of price reductions, which are of ever greater importance in the face of the cost of living crisis.

5.3.1.3 Socio-economic Benefit

143. The UK Clean Growth Strategy (HM Government, 2017) recognises that actions and investments will be needed to meet the Paris Agreement commitments and that the shift to clean growth will be at the forefront of policy and economic decisions made by governments and businesses in the coming decades. This creates enormous potential economic opportunity – an estimated $13.5 trillion of public and private investment in the global energy sector alone will be required between 2015 and 2030, if the signatories to the Paris Agreement are to meet their national targets (BEIS, 2017).

144. In 2017, ORE Catapult undertook analysis of the UK offshore wind supply chain and estimated the current and future potential UK content of offshore wind projects as: 32% in 2017; 50% by 2020; and 65% by 2030. For context it was 43.1% in 2022 (BEIS, 2021c) so the projected figures remain valid. In the UK, the Gross Value Added (GVA) to the UK per GW installed, assuming 32% UK content, has been estimated as £1.8bn and is projected to increase to £2.9bn by 2030 – if 65% UK content can be achieved (assuming that 19GW installed capacity is reached) (ORE Catapult, 2017b). It is estimated that the total (domestic and export) market for UK-provided offshore wind could exceed £10.5bn by 2050 and reach £4.9bn annually by 2030 and £8.9bn by 2050 (under a high scenario) (ORE Catapult, 2018).

145. According to RenewableUK's Offshore Wind Industry Investment in the UK report (RenewableUK, 2017), 48% of the total expenditure associated with UK offshore wind farms was spent in the UK in 2015. The UK content of expenditure during the development stage and operation of offshore wind projects was 73% and 75% respectively in 2015, whereas during manufacturing and construction, the UK content was 29% (RenewableUK, 2017).

146. The UK is positioned to continue growth in the offshore wind sector by maximising domestic energy resources and utilising the vast offshore wind resource which the UK holds. The UK also has a strong supply chain that continues to expand to support the growth in offshore wind.

147. The Energy White Paper: Powering Our Net Zero Future (HM Government, 2020) focusses on making the transition to clean energy by 2050 and what this will mean for consumers of energy in homes and places of work. A key aim for offshore renewables within the White Paper states:

148. "*We will invest in the growth of the UK's offshore wind manufacturing infrastructure to create jobs and opportunity in the UK supply chain. We will use our Offshore Wind Sector Deal with the renewables sector to ensure that domestic deployment creates jobs and raises skills levels across the country, and to support overseas trade and investment opportunities for UK-based companies. We will require developers who are awarded a CfD, to honour their supply chain plans".*

149. The energy sector in the UK plays a central role in the economy. Renewable energy can play a major part in boosting the economy and providing new jobs and skills.

150. The offshore wind industry in the UK provides important employment opportunities. The importance of maximising opportunities for the involvement of local businesses and communities in offshore wind has been highlighted as a key success factor for the wind energy sector in the UK (TCE, 2014). Low carbon businesses and their supply chain have created over 430,000 skilled jobs in the UK with 7,200 jobs directly in offshore wind (BEIS, 2020b).

151. RenewableUK (2017) states: *"Offshore wind has become a key part of the UK economy, creating much needed jobs not only in coastal communities like Hull, Grimsby and Great Yarmouth, but also across the country in the ever-expanding supply chain. A huge number of British companies are heavily involved in building the UK's world-leading offshore wind sector."*

152. The UK Government's Ten Point Plan for a Green Industrial Revolution (November 2020) also sets out the approach the Government will take to support green jobs and accelerate the path to net zero. Steps have already been taken to realise this ambition through industry investment into the Offshore Wind Growth Partnership of up to £250m to support better, high-paying jobs right across the UK (BEIS, 2019a).

153. The Offshore Wind Sector Deal builds on the UK's global leadership in offshore wind, maximising the advantages for UK industry from the global shift to clean growth (BEIS, 2020b). The Government's higher target for 50GW by 2030 BEIS, 2022a) demonstrates the Government's recognition of the need to accelerate progress. The UK Government Ten Point Plan supports the industry's target to achieve 60% UK content by 2030. BEIS (2022b) states that the government's 'Ten point plan for a green industrial revolution', 'Net zero strategy' and 'Energy Security Strategy', will drive £100 billion in private sector investment into new British industries, including offshore wind and support around 480,000 clean jobs by 2030.

154. In a letter to Prime Minister Boris Johnson, the CCC stressed that after the COVID-19 crisis actions towards net-zero emissions and to limit the damages from climate change will help rebuild the UK with a stronger economy and increased resilience (CCC, 2020). The CCC has advised the UK Government that reducing greenhouse gas emissions and adapting to climate change should be integral to any recovery package.

155. SEP and DEP will provide a valuable contribution to employment. During the construction of SEP and DEP it is estimated up to 1,730 full-time equivalent (FTE) jobs could be created. During the operation phase it is expected that SEP and DEP could employ 230 full-time equivalent (FTE) jobs, assuming that all direct operation and maintenance employment would be directly employed by SEP and DEP and based in the UK for the lifetime of SEP and DEP. SEP and DEP will also contribute to development of the supply chain and skilled workforce and the associated economic benefits. The indirect effects from employment and expenditure such as from the workforce will contribute to the local economy.

156. There will also be significant expenditure in manufacturing, services, materials and equipment. Together, the two offshore wind farms have an estimated overall construction cost of £2.14 billion (in current pricing). Operation and Maintenance amounts to around £18.5 million per annum for DEP and £13.5 million per annum for SEP, totalling around £32.1 million per annum across both offshore wind farms. In total, the GVA of SEP and DEP over the project lifetime (40 years) is expected to be £800 million making a significant contribution on the national level and £450 million GVA locally at the East Anglia level.

157. Details of the anticipated expenditure and employment from the construction and operation of SEP and DEP (direct and indirect) are discussed further in ES **Chapter 27 Socio-Economics and Tourism** (document reference 6.1.27).

5.3.2 Public Benefit Against Damage to CSCB MCZ

158. The relevant public benefit relating to SEP and DEP must be set against the weight of the conservation interest protected by the MCAA, having regard to the nature and extent of the harm identified to the conservation objectives, alone or in-combination with other plans and projects. The effects upon the MCZ are assessed in the **Stage 1 CSCB MCZ Assessment** (document reference 5.6) and summarised in **Section 4.4.3**. There is potential for long term habitat loss from the installation of external cable protection in the MCZ, however the alone and in-combination assessment concludes that the habitat loss is small scale and the conservation objectives of the MCZ would not be hindered.

159. In weighing up the public interests delivered by SEP and DEP with these conservation interests account needs to be taken of the fact that the benefits of SEP and DEP include conservation benefits for the marine habitats concerned. The SEP and DEP contribution to reducing the effects of climate change will have ecological benefits which outweigh/override the effects outlined above. Global warming places many species at risk, with a loss of suitable habitat including marine habitat and/or prey due to changing conditions. Rapid, large changes in global temperatures and changes in rainfall patterns may lead to significant rises in sea temperatures, habitat changes and changes to the status of the MCZ, and in turn the extinction of certain species that cannot adapt rapidly. Extinctions and changes in the number of species in a population will have significant impact on food chains (BEIS, 2019b).

5.3.3 Clear Public Benefits Summary

160. This section demonstrates that there is a clear public benefit to delivering SEP and DEP.

161. The environmental and social benefits to the UK from increasing the generation of low carbon energy are clear, with SEP and DEP providing a critical contribution. SEP and DEP contribute to the UK's legally binding climate change targets by helping to decarbonise the UK's energy supply, whilst contributing to the essential tasks of ensuring security of supply and providing low cost energy for consumers in line with the UK Government's national policies.

162. If the Secretary of State concludes that SEP and DEP could risk hindering the conservation objectives of the CSCB MCZ due to the worst-case scenario impacts described in **Section 4.4**, there is a clear public benefit in delivering the Projects and the policy objectives they would serve, which outweighs the risks to the conservation objectives of the CSCB MCZ.

6 MEASURES OF EQUIVALENT ENVIRONMENTAL BENEFIT

163. If MEEB are deemed to be required by the Secretary of State, the planting of oyster beds within the CSCB MCZ would be progressed as the preferred MEEB. Details of the proposed MEEB, including the implications of the different project development scenarios to this measure, are provided in **Appendix 1 In-Principle MEEB Plan** (document reference 5.7.1).

164. The draft DCO wording that would secure the implementation of native oyster bed restoration as a MEEB (should this be required) is provided in Annex D of **Appendix 1 In-Principle MEEB Plan** (document reference 5.7.1).

165. A MEEB steering group would be established as a component of the MEEB Plan. The steering group would be engaged during the development of the detailed MEEB Plan post consent and to review monitoring of the MEEB.

166. In the unlikely event that development of oyster beds within the CSCB MCZ is unsuccessful, an alternative MEEB would become necessary. Annex A of **Appendix 1 In Principle MEEB Plan** (document reference 5.7.1) outlines a range of other MEEB options considered to date. The onus would be on the Applicant to find an alternative MEEB, in consultation with the steering group.

167. **Appendix 1 In-Principle MEEB Plan** (document reference 5.7.1) demonstrates that there is a feasible MEEB available for impacts on the CSCB MCZ as a result of the deployment of external cable protection for SEP and DEP, should the Secretary of State conclude that there is a risk of the conservation objectives of the MCZ being hindered.

7 CONCLUSION

168. The Applicant maintains that derogation of the MCAA 2009 is not required, in accordance with the findings of the **Stage 1 CSCB MCZ Assessment** (document reference 5.6) that there will be no risk to the conservation objectives of the CSCB MCZ as a result of SEP and DEP.

169. Should the Secretary of State be minded to disagree with this position, the evidence presented in this document clearly demonstrates that there are no OMoP (**Section 4**) which could deliver the project objectives (**Section 4.3.2**), in accordance with the need for SEP and DEP (**Section 4.3.1**).

170. In addition, there are clear public benefits to the delivery of SEP and DEP, as outlined in **Section 5**.

171. **Appendix 1 In Principle MEEB Plan** (document reference 5.7.1), summarised in **Section 6** describes the proposed MEEB (if required) which is deliverable post consent and can be secured by the draft DCO wording outlined in **Annex D** of this document.

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