


Cambois Connection – Onshore Scheme
Environmental Statement Volume 2
Chapter 3: EIA Methodology

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Acronyms

Acronym	Description
IAQM	Institute of Air Quality Management
BBWF	Berwick Bank Wind Farm
BERR	Department for Business Enterprise & Regulatory Reform; now the Department for Energy Security and Net Zero
CIEEM	Chartered Institute for Ecology and Environmental Management
CEA	Cumulative Effects Assessment
CRoW	Countryside and Rights of Way Act 2000iema
DECC	Department for Energy and Climate Change, now part of the Department for Business, Energy and Industrial Strategy (BEIS)
DMRB	Design Manual for Roads and Bridges
EEA	European Economic Area
EIA	Environmental Impact Assessment
EC	European Commission
ES	Environmental Statement
EU	European Union
GHG	Greenhouse gas
GLVIA	Guidelines for Landscape and Visual Impact Assessment, Third Edition
HVDC	High Voltage Direct Current
HVAC	High Voltage Alternating Current
IEMA	Institute of Environmental Management and Assessment
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
NCC	Northumberland County Council
NSIP	Nationally Significant Infrastructure Project
PINS	Planning Inspectorate
NS	NatureScot
ZOI	Zone of Influence

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3. EIA Methodology


3.1. Introduction

1. This Environmental Statement (ES) has been developed to support the planning application under Section 57 of the Town and Country Planning Act 1990 for the Onshore Scheme of the Cambois Connection in accordance with the requirements of the Town and Country Planning (Environmental Impact Assessment Regulations) 2017 (as amended) hereinafter referred to as the Environmental Impact Assessment (EIA) Regulations.
2. Volume 2, Chapter 2 on Legislative Context and Policy provides further details on the EIA Regulations and the consenting process and associated legislation for the Onshore Scheme. Volume 2, Chapter 5: Project Description provides a detailed description of the Onshore Scheme, which comprises all infrastructure and activities required as part of the Cambois Connection landward of Mean Low Water Springs (MLWS).
3. This chapter of the ES presents the EIA methodology used for the assessment of likely significant effects of the Onshore Scheme on physical, biological and human environment receptors throughout all phases of the Onshore Scheme (construction, operation and maintenance, and decommissioning). It describes the approach that has been employed to determine impact magnitude, receptor sensitivity, and conclusions on the likely significance of effect, including for inter-related effects and cumulative effects. The Chapter also sets out the applied approach to mitigation.
4. A separate Marine ES has been prepared by the Applicant under:
 - The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).
5. The Marine ES presents an assessment of the likely significant effects of the Marine Scheme (as defined), that is all infrastructure and activities required as part of the Cambois Connection, seaward of Mean High Water Springs (MHWS), on physical, biological and human environment receptors.

3.2. Legislation, Policy, and Guidance

3.2.1. Legislation and Policy

6. The following legislation and policy have been used to inform the EIA methodology. The legislation and policy are detailed fully within Volume 2, Chapter 2: Policy and Legislative Context.
 - EU Council Directive 2011/92/EU as amended by Council Directive 2014/52/EU ('the EIA Directive') and the EIA Regulations;
 - EU Council Directive 2009/147/EC ('the Birds Directive') and EU Council Directive 92/43/EEC ('the Habitats Directive'); which have been transposed into UK law as The Conservation (Natural Habitats &c.) Regulations 1994, or the 'Habitats Regulations'
 - Conservation of Habitats and Species Regulations 2017 (as amended);
 - The Wildlife and Countryside Act 1981;
 - The Water Framework Directive 2000/60/EC and the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
 - The Environment Act 2021;
 - Environmental Permitting (England and Wales) Regulations 2016;
 - Countryside and Rights of Way (CRoW) Act 2000; and

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- Natural Environment and Rural Communities Act 2006.

3.2.2. Guidance

7. This Onshore Scheme ES has been developed in accordance with relevant industry guidance, and experience from previous projects, including the Institute of Environmental Management and Assessment (IEMA) guidance on impact assessment, which states that the EIA should “*follow a clear progression, from the characterisation of ‘impact’ to the assessment of the significance of the effects taking into account the evaluation of the sensitivity and value of the receptors*” (IEMA, 2016(b)). In addition to chapter specific guidance, the following standard industry guidance has been used to inform this ES:


- Assessment of the Environmental Impact of Offshore Wind-Farms (OSPAR Commission, 2008);
- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in Britain and Ireland – Terrestrial, Freshwater, Coastal and Marine (CIEEM, updated April 2022);
- IEMA Impact Assessment Strategy (IEMA, 2019)
- Design Manual for Roads and Bridges (DMRB), Introduction to Environmental Assessment (LA101) (Highways Agency, 2019);
- DMRB, Environmental Assessment and Monitoring (LA104) (Highways Agency, 2019);
- UK Planning Inspectorate Advice Note Seventeen: Cumulative Effects Assessment (PINS, 2019);
- A Handbook on Environmental Impact Assessment: Guidance for Competent Authorities, Consultees and others involved in the EIA Process in Scotland (NatureScot, 2018);
- Delivering Proportionate EIA (IEMA, 2017);
- Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022);
- Environmental Impact Assessment Guide to Shaping Quality Development (IEMA, 2015); and
- The State of Environmental Impact Assessment Practice in the UK (IEMA, 2016a);
- Environmental Impact Assessment Guide to Delivering Quality Development (IEMA, 2016b);
- UK Planning Inspectorate Advice Note Nine: Rochdale Envelope (PINS, 2018).
- Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects. (PINS, 2019);
- UK Planning Inspectorate Advice Note Twelve: Transboundary Impacts. (PINS, 2020).

8. Other relevant guidance issued by other UK Government and non-governmental organisations topic-specific guidance documents are detailed with the relevant chapters of this ES (Chapter 7-16). Notable are:

- Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLVIA3) (Landscape Institute, 2013);
- Guidance on the Assessment Dust from Demolition and Construction, v1.1. (IAQM, 2016).
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites. (IAQM, 2020).

3.3. Scoping and Consultation

9. The Onshore Scheme Scoping Report (BBWFL, 2022), submitted to Northumberland County Council (NCC) on 4th January 2023 outlined the proposed methodologies, including for project alone, inter-related, cumulative effects assessments, to allow consultees to comment on the approach proposed. Table 3-1 below summarises the key queries raised through consultation regarding EIA methodology

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and how these queries have been addressed. Consultation regarding the proposed scope, and methodology for technical assessments is summarised and considered within the technical ES chapters (Volume 2, Chapter 7-16)


Table 3-1 Summary of key consultation queries raised for EIA methodology

Consultee and Date	Summary of Consultation	Response
NCC Scoping Opinion 29/12/2022	The ES should be proportionate to the proposal and should scope out those elements that have already been assessed by the original consent for the offshore windfarm. Only those elements relevant to the onshore components of the development should be assessed where they result in an impact on their own or cumulatively with the already consented windfarm.	Please refer to sections 3.4.1, 3.4.8 and 3.4.9 of this chapter.
NCC Scoping Opinion 29/12/2022	Schedule 4 of 2017 Regulations provides details of information that must be included in an ES. The Council recommends that the ES follows the structure outlined below: <ul style="list-style-type: none"> • Method Statement. • Conclusions of scoping exercise – the key issues. • Description of the proposed development, site, and surroundings, including alternatives studied. • Plans and policies context. • Assessment of environmental effects by topic area. • Inter-relationships/Conclusion. • Appendices – technical data. 	The ES conforms with the advice provided.
NCC Scoping Opinion 29/12/2022	The ES should not be overly long and should be understandable to the public. Ideally, it should not contain technical jargon or include technical data and calculations that can only be understood by experts. Technical words should always be explained where their use is unavoidable, and technical data can be provided in separate appendices. A separate non-technical summary is also required in accordance with the 2017 Regulations. This should ideally be no more than 10 pages of easily reproducible text and illustrations. It should include information on the development, the main environmental impacts, and the mitigating measures	The ES conforms with the advice provided with the exception of the NTS is longer than 10 pages.

10. Details on public consultation events carried out for the Onshore Scheme is provided in Volume 2, Chapter 6: Stakeholder Consultation and Engagement.

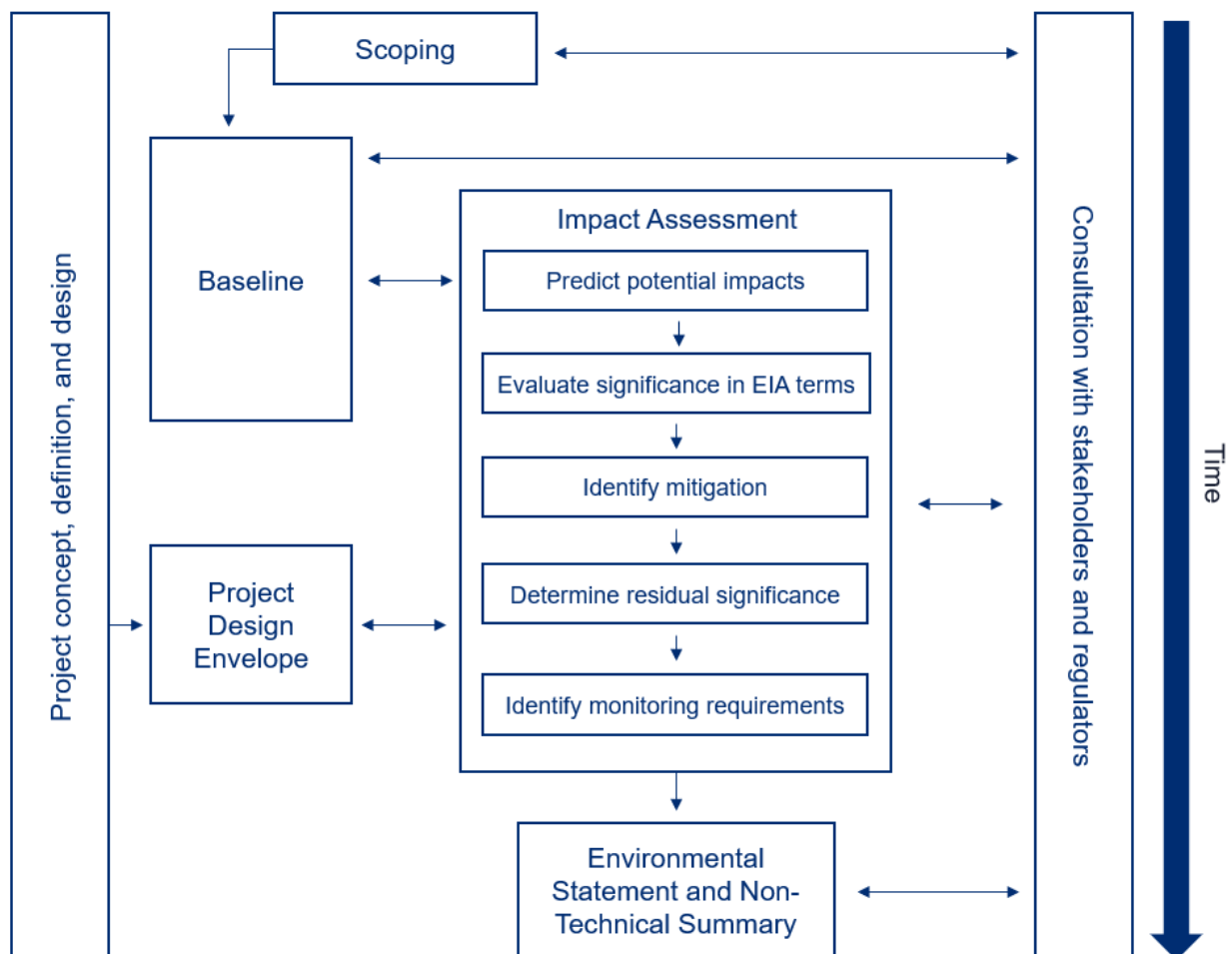
3.4. Overview of the Methodology

11. EIA is a systematic process which identifies the potential impacts of a development and then seeks to avoid, reduce or offset any likely significant effects (both adverse and beneficial) on the physical, biological and human environment, through mitigation measures where possible. The EIA process is both iterative and cyclic and has been completed in tandem with project design. Where potential impacts were identified during initial route selection as part of early stage design, options for avoiding

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or reducing those impacts (mitigation) were incorporated into the design of the Onshore Scheme (designed-in measures). Where avoidance of impacts was not practicable (e.g. through design), reduction or offsetting of the likely significant effects through other mitigation measures (including secondary and tertiary measures) were proposed. See section 3.4.4 for the approach mitigation within this ES. Similarly, where there is the potential for the Onshore Scheme to benefit the environment, measures have been put in place to maximise these benefits. Consultation, a vital component of the EIA process, has been undertaken during each stage of the EIA process and has contributed both to the identification of potential impacts, and the development of mitigation measures.

12. Where practicable, environmental considerations have been integrated into the design of the Onshore Scheme, i.e., the decision to eliminate open cut trenching at Landfall through route refinement and optioneering, as further detailed in Volume 2, Chapter 4: Route Appraisal and Consideration of Alternatives.
13. The EIA methodology for the Onshore Scheme has followed the process outlined in Figure 3-1 below, which is detailed fully in the sections below.





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Figure 3-1 EIA Methodology

3.4.1. EIA Scoping

14. The Onshore Scheme Scoping Report (BBWFL, 2022) was submitted to NCC in November 2022 in accordance with the EIA Regulations.
15. The objective of the Onshore Scheme Scoping Report (BBWFL, 2022) was to engage with NCC, regulators, statutory and non-statutory consultees in the EIA process, inviting them to provide relevant information and to comment on the proposed approach to the EIA. This would ensure that a robust and proportionate ES was submitted in support of the Planning Application. To engage in an informed manner, the Onshore Scheme Scoping Report (BBWFL, 2022) provided information on:
 - The Onshore Scheme, including the cable Landfall, the onshore High Voltage Direct Current (HVDC) cables, the Onshore Converter Station, the High Voltage Alternating Current (HVAC) grid cables and works to integrate into the existing National Grid substation at Blyth;
 - The proposed outline approach to understand further the baseline conditions and address the potential environmental impacts through the EIA process;
 - The topics to be scoped into the EIA, where potentially significant impacts may result from the Onshore Scheme on the physical, biological and human environment; and
 - The topics to be scoped out of the EIA, where significant impacts are not anticipated when designed in (primary) and industry best practice mitigation are implemented.
16. The Scoping Opinion for the Onshore Scheme was received from NCC on 29th December 2022. This ES incorporates the feedback gained through the Scoping Opinion and subsequent consultation. A summary of the responses to the Scoping Opinion and further consultation is provided in Volume 2, Chapter 6: Consultation and Engagement and each topic chapter includes a summary of the relevant responses and how the assessment has dealt with these responses.
17. Based on the Scoping Opinions received and the consultation to date (summarised previously in section 3.3), this Onshore Scheme ES focuses on the following EIA topics that have been scoped in:
 - Terrestrial ecology (Volume 2, Chapter 9);
 - Ornithology (Volume 2, Chapter 9);
 - Landscape and visual amenity (Volume 2, Chapter 7);
 - Hydrology and flood risk (Volume 2, Chapter 11);
 - Geology and soils (Volume 2, Chapter 10);
 - Air quality (Volume 2, Chapter 14);
 - Human beings and health (Volume 2, Chapters 12-15);
 - Archaeology and cultural heritage (Volume 2, Chapter 8); and
 - Inter-related effects (Volume 2, Chapters 7-15).
18. As presented in the Cambois Connection Onshore Scheme EIA Scoping Report (BBWFL, 2022) the topics scoped out for assessment include:
 - Aviation, military and radar – due to the absence of tall structures in the Onshore Scheme;
 - Major accidents and disasters – due to the absence of activities which are likely to give rise to a risk of major accidents or could foreseeably create circumstances which would amount to a disaster;
 - Human health standalone assessment – as potential impacts arising from the Onshore Scheme of relevance to human health primarily relate to landscape & visual amenity (chapter 7), air quality (Chapter 14) and noise & vibration (chapter 13);

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- Change in land use – due to limited temporary nature of land use impacts during construction, restriction of operational impacts to the Converter Station, and on the basis that other potential impacts on hydrogeology / flood risk and potential ground contamination on other users of ‘land’ locally in terms of recreational activities are considered elsewhere in the ES (chapter 10: Geology & Soils, chapter 11: Hydrology & Hydrogeology and chapter 15: Socio-economics, Tourism and Recreation;
- Transboundary impacts – see section 3.4,10.

19. A greenhouse gas (GHG) assessment is provided in Volume 3, Technical Appendix 5.1: Effects on Climate (Greenhouse Gas Emissions).


20. Volume 2, Chapter 6: Stakeholder Consultation and Engagement provides information on the justification for the scoped out topics above. Each topic or impact assessment chapter (Volume 2, Chapter 7 to 16) details the impacts or receptors that have been scoped out of the assessment for that particular topic. The scope of this ES complies with the requirements set out by the EIA Regulations. Table 3-2 outlines the requirements of the EIA Regulations, and where these requirements have been considered within this ES.

Table 3-2 EIA Regulations Requirements Addressed in the Onshore Scheme ES

EIA Regulations Requirement	Relevant Onshore Scheme ES Chapter (Volume 2)
1. A description of the development, including in particular:	
(a): a description of the location of the development	Volume 2, Chapter 1: Introduction Volume 2, Chapter 5: Project Description
(b): a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;	ES Volume 2, Chapter 5: Project Description
(c) a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;	ES Volume 2, Chapter 5: Project Description
(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.	ES Volume 2, Chapter 5: Project Description
2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.	ES Volume 2, Chapter 4: Site Selection and Consideration of Alternatives
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	ES Volume 2, Chapters 7 to 15: Section 7.7.2, Section 8.7.2, Section 9.7.2, Section 10.7.2, Section 11.7.2, Section 12.7.2, Section 13.7.2, Section 14.7.2, and Section 15.7.2.
4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for	ES Volume 2, Chapters 7 to 15: Section 7.7.1, Section 8.7.1, Section 9.7.1, Section 10.7.1,

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EIA Regulations Requirement	Relevant Onshore Scheme ES Chapter (Volume 2)
<p>example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape.</p>	<p>Section 11.7.1, Section 12.7.1, Section 13.7.1, Section 14.7.1, and Section 15.7.1.</p>
<p>5. A description of the likely significant effects of the development on the environment resulting from, inter alia:</p>	
<p>(a) the construction and existence of the development, including, where relevant, demolition works</p>	<p>ES Volume 2, Chapters 7 to 15: Section 7.11, Section 8.11, Section 9.11, Section 10.11, Section 11.11 Section 12.11, Section 13.11, Section 14.11, and Section 15.11.</p>
<p>(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;</p>	<p>ES Volume 2, Chapter 7, Chapter 8, Chapter 9, Chapter 10 and Chapter 11</p>
<p>(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;</p>	<p>ES Volume 2, Chapter 10, Chapter 11, Chapter 13 and Chapter 14</p>
<p>(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);</p>	<p>ES Volume 2, Chapter 8, Chapter 12, Chapter 13 and Chapter 14</p>
<p>(e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;</p>	<p>ES Volume 2, Chapters 7 to 15: Section 7.13, Section 8.13, Section 9.13, Section 10.13, Section 11.13 Section 12.13, Section 13.13, Section 14.13, and Section 15.13.</p>
<p>(f) the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change</p>	<p>ES Volume 3, Technical Appendix 5.1</p>
<p>(g) the technologies and the substances used.</p>	<p>ES Volume 3, Chapter 5: Project Description</p>
<p>The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development. This description should take into account the environmental protection objectives established at Union or Member State level which are relevant to the project, including in particular those established under Council Directive 92/43/EEC(a) and Directive 2009/147/EC(b).</p>	<p>ES Volume 2, Chapters 7 to 15</p>
<p>6. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.</p>	<p>ES Volume 2, Chapters 7 to 15: Section 7.9 , Section 8.9, Section 9.9, Section 10.9, Section 11.9 Section 12.9, Section 13.9, Section 14.9, and Section 15.9.</p>

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EIA Regulations Requirement	Relevant Onshore Scheme ES Chapter (Volume 2)
<p>7. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.</p>	<p>ES Volume 2, Chapters 7 to 15: Section 7.9 , Section 8.9, Section 9.9, Section 10.9, Section 11.9 Section 12.9, Section 13.9, Section 14.9, and Section 15.9</p>
<p>8. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to EU legislation such as Directive 2012/18/EU(c) of the European Parliament and of the Council or Council Directive 2009/71/Euratom(d) or UK environmental assessments may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.</p>	<p>Due to the absence of activities which are likely to give rise to a risk of major accidents or could foreseeably create circumstances which would amount to a disaster, no significant effects are anticipated.</p>
<p>9. A non-technical summary of the information provided under paragraphs 1 to 8.</p>	<p>ES Volume 1</p>
<p>10. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.</p>	<p>ES Volume 2, Chapters 7 to 15: Section 7.16, Section 8.16, Section 9.16, Section 10.16, Section 11.16 Section 12.16, Section 13.16, Section 14.16, and Section 15.16.</p>

3.4.2. Intertidal Impacts

21. There is overlap between the Onshore Scheme and the Marine Scheme within the intertidal zone, between MHWS and MLWS, where development under each scheme is due to be located. For the avoidance of doubt, this Onshore Scheme ES assesses impacts of all Project infrastructure located landwards of MLWS regardless of whether impacts occur onshore or offshore, and the Marine Scheme ES assess impacts of all Project infrastructure located seawards of MHWS.

3.4.3. Maximum Design Scenario

22. In accordance with best practice, the Onshore Scheme will utilise a maximum design scenario (MDS) approach to inform the EIA This envelope approach allows a range of parameter values to be presented for each component of the Onshore Scheme and ensures that flexibility is retained in the design. The MDS will cover all components of, and activities associated with the construction, operation and maintenance and decommissioning of the Onshore Scheme.
23. Within the EIA, the design parameters which represent the realistic MDS for the impact assessments will be determined on a case-by-case basis, depending on the receptors and impacts being considered in each technical assessment chapter (Volume 2, Chapters 7 to 16). Realistic combinations of design parameters will be considered to ensure that the ‘worst-case’ scenario options are not overly precautionous or unrealistic. Under this approach, the combination Onshore Scheme design options constituting the worst-case scenario may necessarily differ from one receptor to another and from one impact to another. The end result will be an EIA based on clearly defined parameters that will define

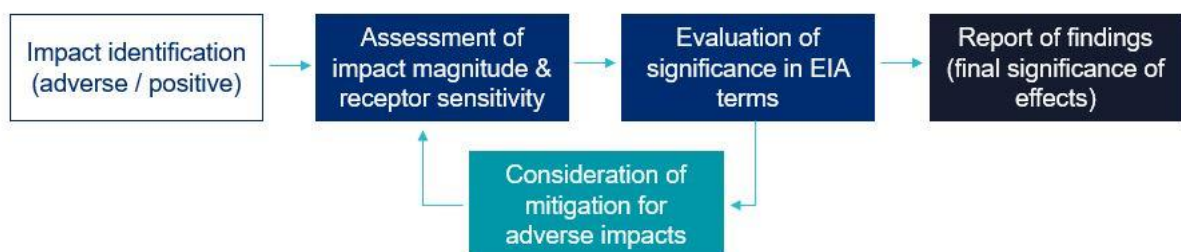
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the range of Onshore Scheme design possibilities and hence the likely environmental impacts that could result from the Onshore Scheme.

24. Within each technical assessment chapter of the ES the MDS for the impact assessment is set out in full. Given that the assessment is based on the design option (or combination of options) that represents the greatest realistic potential for impact (and therefore effect) confidence can be held that development of any alternative options within the MDS will give rise to effects that are no greater or worse than those assessed within this ES.
25. There are some design details related to the Onshore Scheme that are still to be finalised due to further ground investigations required, ongoing engineering design work and the procurement of cable and converter station suppliers. These details will inform the final specification. The Site boundary and MDS has been chosen to allow flexibility to accommodate these design details which will be subject to future application(s) for approval of Reserved Matters.

3.4.4. Approach to Mitigation

26. In accordance with the IEMA (2016b) ‘Guide to Delivering Quality Development’, mitigation measures can fall into the following classifications:
 - Primary mitigation - measures built into the design of the project which reduce or avoid the likelihood or magnitude of an adverse environmental effect, including location or design. Primary mitigation measures do not require additional action to be taken;
 - Secondary mitigation – are additional measures that require further action post-consent and do not form part of the fundamental design of the project; and
 - Tertiary mitigation – are measures that are required through standard practice or to meet legislative requirements and are independent of the EIA process (i.e. they would be implemented regardless of the findings of the EIA).
27. Primary and tertiary mitigation measures are considered to be ‘built into’ the design of the Onshore Scheme.
28. Where a given impact is assessed to result in a likely significant adverse effect in EIA terms, changes are made to the parameters or design of the project, or specific mitigation measures are implemented to avoid, reduce or offset the magnitude of that impact. This process is continued as illustrated in Figure 3-2 until the effect has been reduced to ‘not significant’, or until it is deemed that no further changes or practicable mitigation measures are available in which case the residual effect may be presented as significant in EIA terms within the ES.




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Figure 3-2 Assessment of effects process

3.4.4.1. DESIGNED IN MEASURES (PRIMARY MITIGATION)


29. IEMA (2016) describe Primary (inherent) mitigation as: “Modification to the location or design of the development made during the pre-application phase that are an inherent part of the project, and do not require additional action to be taken”
30. Primary mitigation has been referred to as “designed in measures” within this Onshore Scheme ES.
31. As part of the Onshore Scheme design process, a number of designed in measures (primary mitigation) have been considered to reduce the potential for impacts to the environment. These are considered inherently part of the design and have therefore been considered in the assessments undertaken as part of each ES technical chapter (Volume 2, Chapter 7 to 16).
32. The designed in measures (primary mitigation) to the Onshore Scheme are inherent in the reduction of potential impacts to the environment by, for example retention of priority woodland in the west of the Onshore Converter Station Zone, which is outlined further in Volume 2, Chapter 4: Site Selection and Consideration of Alternatives.

3.4.4.2. SECONDARY MITIGATION

33. IEMA (2016) describe Secondary (foreseeable) mitigation as: “Actions that will require further activity in order to achieve the anticipated outcome. These may be imposed as part of the planning consent, or through inclusion in the Environmental Statement”.
34. Secondary mitigation is considered as additional measures that are implemented to further reduce environmental effects to ‘not significant’ levels where the initial assessment concludes there is the potential for a significant effect to occur.
35. Consistent with standard industry practice and accepted methodology for EIA, a standard hierarchical approach has been adopted when identifying mitigation requirements; this is summarised below:
 - **Avoid or Prevent:** Measures which avoid creating impacts from the outset. For example, careful siting of infrastructure to avoid direct impacts on receptors, or scheduling of works outside sensitive ecological windows (i.e., breeding season);
 - **Reduce:** Measures taken to reduce the duration, magnitude and/or extent of impacts that cannot be completely avoided. For example, restricting construction works to certain hours only; and
 - **Offset:** Measures implemented to compensate for any likely significant adverse effects that cannot be appropriately avoided or reduced. For example, landscaping of the converter station.
36. After the consideration of any secondary mitigation measures, the residual significance of an effect is considered.

3.4.4.3. TERTIARY MITIGATION

37. IEMA (2016) describe Tertiary (inexorable) mitigation as: “Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirement, or actions that are considered to be standard practices used to manage commonly occurring environmental effects”.
38. Tertiary mitigation are measures which will be implemented regardless of the design process and the EIA, for example, those requirements prescribed by relevant legislation. These measures include actions that are considered to be standard industry practices used to manage commonly occurring

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environmental effects (IEMA, 2016b). Tertiary mitigation is therefore considered ‘designed in’ measures, in line with primary mitigation.

3.4.5. Characterising the Baseline Environment

39. The environmental baseline conditions which exist within the topic specific local and regional study areas of the Onshore Scheme have been established to assess the potential impacts arising from the Onshore Scheme. In addition to the characterisation of the baseline environment, the potential evolution of the baseline conditions in the study areas throughout the lifetime of the Onshore Scheme has been assessed to understand potential future change of predicted effects (the ‘Future Baseline Scenario’). This has been based on publicly available information, research and professional judgement.
40. The characterisation of the environmental baseline for the Onshore Scheme has been established through the stages detailed below to establish a robust baseline for each EIA topic:
 - Defining the study area for each receptor based on the relevant characteristics of the receptor (e.g., mobility / range);
 - Identifying key environmental and human sensitive receptors in the relevant study areas;
 - Completing primary baseline data collection (including surveys and reporting to inform the EIA);
 - Review of secondary sources (desk-based assessment and review of existing information and data local and/or relevant to the Onshore Scheme);
 - Stakeholder engagement (detailed discussions with a range of stakeholders to help expand on the findings from wider field and desk-based studies);
 - Identifying likely or potential impacts that might be expected to arise from the Onshore Scheme;
 - Determining if there is sufficient evidence to characterise the environmental baseline in appropriate detail; and
 - Identifying data gaps or limitations and describing the implications of these on the baseline characterisation and on assessing significance of likely effects.
41. A detailed baseline has been established within each of the technical chapters of this ES based on the stages described above and the outputs from the Scoping Opinion received from NCC on 29th December 2022.

3.4.6. Assessment of Impacts and Effects

42. For each impact, the assessment identifies a receptor’s sensitivity to that impact’s effect and implements a systematic approach to understand the significance of the resulting effect associated with the impact under consideration.
43. The ‘source-pathway-receptor’ model has been utilised for the identification and assessment of potential effects of the Onshore Scheme as outlined in Figure 3.3. The ‘source-pathway-receptor’ model defines those receptors considered to be at risk from impact from the Onshore Scheme. The source represents the origin of an impact (i.e., an activity related to the Onshore Scheme), the pathway represents the route through the environment by which the effects of an activity are transmitted, and the receptor is the environment or resource that receives the impact, which then causes an effect on the receptor. Where there is no known ‘pathway’ then no effect is considered to occur, and the impact is scoped out.
44. By way of an example, the construction of the Onshore Export Cables disturbs ground which may potentially release loose sediments into the water table (the pathway), which could affect the transmissibility of aquifers (the impact) and increase flood risk (the effect).

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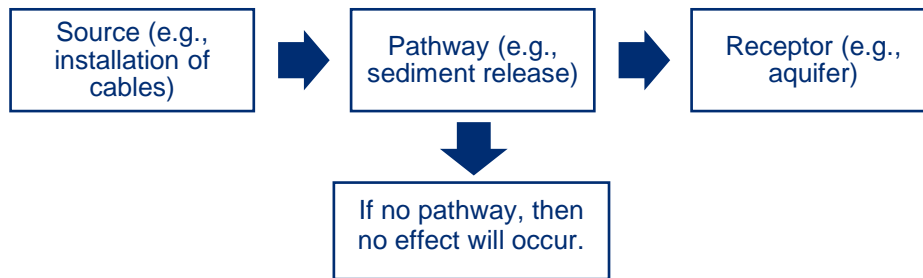


Figure 3-3 Source-pathway-receptor model

45. In the context of this EIA, the terms ‘impact’ and ‘effect’ are not one-and-the-same; their definitions are based on the glossary of the Introduction to Environmental Assessment (Highways England, 2019) and are provided below:

- **Impact:** Change that is caused by an action. Impacts can be defined as direct, indirect, temporary, irreversible, secondary, cumulative and inter-related (Table 3-3). They can also be either positive or negative, although the relationship between them is not always straightforward; and
- **Effect:** Term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact to the sensitivity of the receptor or resource in accordance with defined significance criteria.

46. There is the potential for the Onshore Scheme to have both adverse and beneficial impacts on the environment. The impact identification will consider whether a potential impact is considered adverse or positive, direct or indirect, temporary or permanent. The assessment process will then consider the significance of the resulting effect on the environment, either adverse or beneficial, using the process outlined in the sections below.

47. Table 3-3 provides the definitions of the impact terminology used throughout this ES.


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Table 3-3 Impact terminology relevant to the Onshore Scheme ES

Impact terminology	Definition
Direct Impact	Impacts which result from a direct interaction between the Onshore Scheme and relevant environmental receptors.
Indirect Impact	Impacts on relevant environmental receptors which are not as a direct result of the Onshore Scheme, but which may still require consideration (this can include complex pathways or activities carried out off-site, for example).
Cumulative Impacts ¹	Impacts which result from the cumulative effect of reasonably foreseeable developments, together with the Onshore Scheme.
Inter-related Impacts	Inter-related impacts refer to the inter-relations between topics within an EIA which, when considered in their completeness, may lead to environmental effects by virtue of different (increased) pressures on receptors.
Beneficial Impact	An impact which would result in an improvement to the baseline environment.
Adverse Impact	An impact which would result in a deterioration to the baseline environment.

48. For the impacts scoped into the EIA, the ES will describe the significance of the effect expected to result from the Onshore Scheme using a standard EIA methodology. The method discussed in the following sections has been developed by reference to the latest EIA guidance as outlined in section 3.2.2. Topic-specific guidance is listed in the technical assessment chapters where these have informed the assessment methodology.


49. The assessment process will consider the potential magnitude of change to the baseline conditions arising from Onshore Scheme and the sensitivity of the particular receptor under consideration, as well as any primary mitigation measures (as defined in section 3.4.4).

50. There are a few exceptions where a topic deviates from the generic approach reported in this chapter. One example is the Landscape and Visual Amenity chapter (Volume 2, Chapter 7). This chapter classifies the level of physical and perceptual change to the receiving environment as the ‘magnitude of change’ in line with the recommendations of the ‘Guidelines for Landscape and Visual Impact Assessment’ third edition (GLVIA3) (Landscape Institute, 2013). However, this terminology should be considered interchangeable with ‘magnitude of impact’.

51. In addition, the following deviations from assessment methodology occur within this ES:

- Volume 2, Chapter 9: Terrestrial Ecology and Ornithology follows the guidelines in the Chartered Institute of Ecology and Environmental Management (CIEEM) ‘Guidelines for Ecological Impact Assessment in Britain and Ireland – Terrestrial, Freshwater, Coastal and Marine’ (CIEEM, 2022) where significance is determined independently from sensitivity and sensitivity is only used to determine the level at which an effect is significant; and

¹ The term cumulative assessment is used throughout this ES as defined. To avoid confusion, the term ‘in-combination’ which is suitable in the context of Habitats Regulations Appraisal requirements, is not used within this ES.

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- Volume 2: Chapter 14: Air Quality follows the ‘Guidance on the Assessment Dust from Demolition and Construction, v1.1 (IAQM, 2016) where the risk of impact is then used to determine proportionate mitigation requirements, whereby through effective application, residual effects can be considered to be not significant in terms of the EIA Regulations.

52. For consistency and to aid with review of conclusions in this Onshore Scheme ES, where a topic-specific assessment does deviate from ‘generic’ assessments of significance, a professional judgment relating to a conclusion of ‘significant’ or ‘not significant’ is still provided.

3.4.6.1. IMPACT MAGNITUDE

53. The EIA also considers the magnitude of change associated with a given impact from the Onshore Scheme during the construction, operation and maintenance or decommissioning phase. The main factors which will typically influence this consideration include:

- Spatial extent of change, that is the geographical area over which the impact or effect may occur;
- Duration of change, that is the period of time over which the impact will occur;
- Frequency of change, that is the number of times the impact will occur over the project lifespan; and
- Reversibility of change, e.g. whether recovery or counteraction is possible through action or mitigation.


54. The EIA considers the magnitude of each potential impact; the broad impact magnitude criteria are summarised in Table 3-4 below which is developed from standard industry practice as summarised in paragraph 46. Where technical assessments deviate from the criteria outlined below due to receptor specific considerations, for example, this will be clearly stated within the chapters. In particular, the duration of impacts relates to the period of time over which the impact will occur and is related to factors such as species lifecycles and Project timeframes.

Table 3-4 Impact magnitude

Impact magnitude	Criteria
High	The impact occurs over a large spatial extent resulting in widespread, and/or long-term, permanent changes in baseline conditions or affects a proportion of a receptor population. The impact is very likely to occur and/or will occur at a high frequency or intensity.
Medium	The impact occurs over a local to regional spatial extent and/or a short- to medium-term change to baseline conditions or affects a moderate proportion of a receptor population. The impact is likely to occur and/or will occur at a moderate frequency or intensity.
Low	The impact is localised and/or temporary or short-term, leading to a detectable change in baseline conditions or a noticeable effect on a small proportion of a receptor population. The impact is unlikely to occur or may occur but at low frequency or intensity.
Negligible	The impact is highly localised and/or short-term, with full rapid recovery expected to result in very slight or imperceptible changes to baseline conditions or a receptor population. The impact is very unlikely to occur; if it does, it will occur at a very low frequency or intensity.

3.4.6.2. RECEPTOR SENSITIVITY

55. Receptors are defined as the elements of the receiving environment that is impacted, and could be a component of the physical, ecological or human environment. The sensitivity of a receptor to an impact is based on the following factors:

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- Tolerance to change: ability to withstand / accommodate an impact;
- Recoverability: ability to recover from an impact (i.e., ability to return to baseline state);
- Adaptability: ability to avoid or adapt to an impact; and
- Value: importance (e.g., based on conservation value / protected status or economic value).

56. The sensitivity value given to a receptor is typically determined by balancing considerations of these factors as detailed in Table 3-5.

Table 3-5 Receptor sensitivity

Sensitivity	Definition
Very High	Very high importance and rarity, international receptor with no capability to 'absorb' or accommodate change and no ability to recover or adapt.
High	High importance and rarity, international and/or national receptor and very limited capability to 'absorb' or accommodate change without fundamentally altering the character of the receptor.
Medium	High or medium importance and rarity, regional receptor with some capacity to absorb or accommodate change without significantly altering character, however some damage to the receptor is anticipated to occur.
Low	Low or medium importance and rarity and the receptor is considered tolerant to change without significant detriment to its character; some limited or minor change may occur.
Negligible	Very low importance and rarity, local and receptor is tolerant to change with no effect on its fundamental character.

3.4.6.3. EVALUATING SIGNIFICANCE OF EFFECT

57. Considering the impact magnitude and the sensitivity of a receptor, the significance of the effect can be ascertained based on baseline information, professional judgment, and stakeholder advice. A defined methodology and matrix have been used in each ES technical chapter (Volume 2, Chapter 7 to 15) to ensure consistency when evaluating the significance of effects.
58. The general assessment matrix followed for this ES is included in Table 3-6. Within this ES, any effect with a significance of moderate or greater is considered 'significant' in terms of the EIA regulations, effects identified as minor or negligible are considered to be 'not significant' in terms of the EIA regulations. However, significance has been assessed based on the prevailing topic-specific assessment methodology throughout this ES and using professional judgement where appropriate. Deviations from this matrix are set out within the relevant technical chapters of this ES (Volume 2, Chapter 7 to 15).
59. The matrix approach described above is consistent with the suite of guidance discussed in section 3.2. Minor refinements have been made to reflect both the nature of the Onshore Scheme and to promote greater proportionality.
- Where a magnitude of 'negligible' is identified the effect will always be not significant; and
 - Receptors of negligible importance, value or sensitivity will not be assessed further within the EIA as the resultant effect will always be not significant.


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Table 3-6 Significance of effects matrix

		Magnitude of Impact			
		Negligible	Low	Medium	High
Sensitivity of Receptor	Negligible	Negligible	Negligible to Minor	Negligible to Minor	Minor
	Low	Negligible to Minor	Negligible to Minor	Minor	Minor to Moderate
	Medium	Negligible to Minor	Minor	Moderate	Moderate to Major
	High	Minor	Minor to Moderate	Moderate to Major	Major
	Very High	Minor	Moderate to Major	Major	Major

60. A typical categorisation of effect significance is shown below in Table 3-7, noting that effects can be both beneficial or adverse.

Table 3-7 Definition of consequence of effect and associated significance

Category	Definition	Significance
Major	A fundamental change to the environment or receptor, resulting in a significant effect.	Significant
Moderate	A material but non-fundamental change to the environment or receptor, resulting in a possible significant effect.	Significant
Minor	A detectable but non-material change to the environment or receptor resulting in no significant effect or small-scale temporary changes.	Not Significant
Negligible	No detectable change to the environment or receptor resulting in no significant effect.	Not Significant


61. Where the impact assessment identifies that an activity of the Onshore Scheme is likely to give rise to significant effects, secondary mitigation measures, above and beyond any designed in or tertiary mitigation (as defined in section 3.4.4) will be incorporated into the assessment process so far as practicable to avoid impacts or reduce them to acceptable levels. At this point the impact is reassessed, considering all mitigations to determine the residual effect. Residual effects are defined as the effects remaining once all mitigation measures have been taken into consideration.

3.4.6.4. GEOGRAPHICAL SCOPE OF IMPACTS

62. The Onshore Scheme is located wholly within the boundary of NCC's administrative area.

3.4.7. Monitoring

63. Recommendations for monitoring are included in the relevant technical chapters. Monitoring proposals are linked to clearly defined criteria.

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3.4.8. Inter-Related Effects


64. Assessment of inter-related effects is required under the EIA Regulations, which are defined as the potential effects of multiple impacts affecting one receptor (Highways England, 2019b). The assessment of inter-related effects is provided within Chapter 7 to 15.
65. The inter-related effects assessment considers effects from the Onshore Scheme, and not those from other projects cumulatively with the Onshore Scheme. These latter effects are considered within the Cumulative Effects Assessment (CEA).
66. There are two main types of inter-related effects:
- **Project Lifetime Effects:** these are effects which occur over time at more than one phase of the Onshore Scheme (i.e., construction, operation and maintenance, decommissioning) and may interact together to potentially create a more significant effect on a specific receptor when compared to if only assessed in isolation; and
 - **Receptor-Led Effects:** these are effects which may interact spatially and/or temporally resulting in the potential for inter-related effects on a specific receptor. Receptor-led inter-related effects may be short term, temporary or incorporate longer-term, potentially permanent effects. For example, where potential impacts on a key prey resource (e.g., protected species from multiple impact pathways such as habitat disturbance), results in a greater impact on the receptor species than one impact pathway alone.
67. An assessment of inter-related effects has been undertaken as part of the EIA for the Onshore Scheme, as presented within each technical ES chapter (Chapter 7-15) this has been conducted in a focused manner. Rather than an assessment for every individual receptor considered within the EIA, receptors have been grouped, and ‘scoped’ in or out based on those receptor groups having the potential for significant inter-related effects.
68. Each of the technical chapters of the Onshore Scheme ES were reviewed to identify receptors, or receptor groups, that require assessment and the likely significant effects on these receptors or receptor groups. An exercise was then undertaken to identify where individual effects have the potential to create inter-related effects on receptors, or receptors groups, when combined, for project lifetime and receptor-led effects. A conclusion was then made on the likely significant inter-related effects.
69. Where it is deemed that an effect cannot contribute to any inter-related effects, topic-specific assessments will identify that the significance of the effect is ‘negligible across all stages of the project’. Such effects will not be included within the inter-related effects assessment, as any effect is predicted to be negligible for the lifetime of the Onshore Scheme.
70. The inter-related effects assessment will only consider effects from the Onshore Scheme, and not those from other projects. These will be considered within the Cumulative Effects Assessment (CEA).

3.4.9. Cumulative Effects Assessment

3.4.9.1. LEGISLATION AND POLICY

71. As well as considering impacts from the Onshore Scheme alone, the EIA Regulations require a consideration of potential impacts that could occur cumulatively with other relevant projects, plans and activities, that could result in a cumulative effect. The assessment of cumulative effects is required under several key pieces of legislation and policy; this includes:

- The EIA Directive; and

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- Under Schedule 4 (Part 5) of The EIA Regulations.

3.4.9.2. GUIDANCE

72. The cumulative assessment will follow guidance from National Infrastructure Planning (2019) Advice Note Seventeen: Cumulative Effects Assessment (the Advice Note). This provides guidance on the assessment of cumulative effects relevant to Nationally Significant Infrastructure Projects (NSIPs). Whilst the Onshore Scheme is not an NSIP, there is no single, agreed approach to the completion of cumulative assessments and this guidance is well-tested and provides a robust methodology which is valuable to informing the approach to assessment.
73. As detailed within the Advice Note, this approach follows a systematic and staged process; this is summarised in further detail in Figure 3-4 and within the sections below.

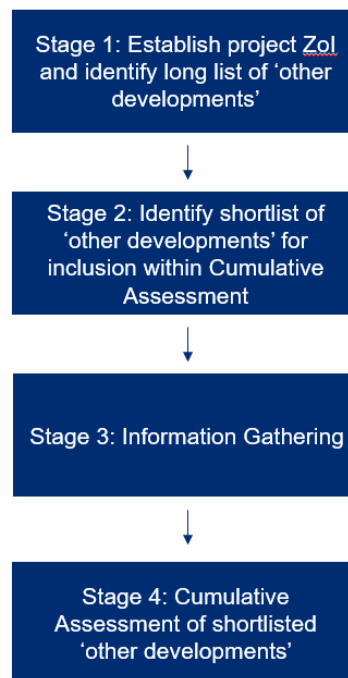



Figure 3-4 Process to assess cumulative effects

74. The Advice Note recommends that, to identify a long list of other developments which may result in likely significant effects, the spatial and temporary impacts of a project be determined first. The Zone of Influence (Zol) for each environmental topic considered within this Onshore Scheme ES has been used to inform the study area for the cumulative assessment. On a precautionary basis, a 3 km Zol has been used as the basis for the initial long list of other developments which is considered to appropriately cover the potential Zol for each environment topic assessed as part of the Onshore Scheme.

3.4.9.3. STAGE 1 – INITIAL SCREENING AND ESTABLISHING THE LONG-LIST

75. An initial screening was performed to identify developments with which the Onshore Scheme may interact that may result in cumulative effects during installation, operation and maintenance, and decommissioning. The screening considered what detail is currently available regarding current and

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future developments, as well as the likelihood of a potential interaction. This considered projects that are ‘reasonably foreseeable’ such as:

- Existing projects in construction;
- Consented projects, awaiting implementation; and
- Proposals awaiting determination within the planning process with design information in the public domain (including other renewable energy or subsea transmission developments that requested a Scoping Opinion by 31st July 2023.

76. The CEA has considered all other relevant plans, projects and activities that are publicly available three months prior to submission of the Onshore Scheme application using the NCC Public Access Planning Register, as follows:

77. A search of planning consents and application in the previous 3-years was undertaken (since July 2023). 3-years was chosen as an appropriate search criterion as this is the typical period conditioned for commencing development as part of any planning consent;

- Planning applications and consents for Screening and Scoping Opinions and Major Development² were recorded;
- Planning applications and consents for discharge of conditions, non-material amendments and Minor Development³ were ignored due to their scale;
- A ‘cut-off’ date of the 31st July 2023 was used to ensure all potentially relevant applications were included; and
- A ‘Zol’ of 3 km from the Site boundary was used to ensure all potentially relevant applications were included.

78. The screening resulted in a long list of potential developments within the 3 km ZOI, as agreed through Scoping. The long list for the CEA is provided in Technical Appendix 3.1, Volume 3 and has been developed using publicly available datasets, such as those from NCC Planning Portal, to identify projects and plans in the vicinity of the Onshore Scheme. A desk-based search of publicly available information was undertaken to compile information such as project name, information source, confidence in project data, scale / capacity, status of the development and construction timescales within the long list.

79. The offshore components of the Cambois Connection (seaward of MHWS) ‘the Marine Scheme’ is subject to a separate application and consenting process under the Marine and Coastal Access Act 2009. The Marine Scheme has been included as a cumulative project for the purposes of the Onshore Scheme CEA as agreed through Scoping, and information on the Marine Scheme has been used to inform this assessment.


3.4.9.4. STAGE 2 – SHORT LISTING

80. The projects included in the long list were reviewed on a topic-by-topic basis based on the knowledge and experience of technical specialists, to identify if there was an impact-receptor-pathway that would result in a cumulative effect.

81. The long list was then reduced to a short list which considered whether the impacts from the Onshore Scheme physically overlapped with the impacts from other developments (with consideration of mobile

² As defined in The Town and Country Planning (Development Management Procedure) (England) Order 2015

³ As defined in The Town and Country Planning (Development Management Procedure) (England) Order 2015

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receptors) or temporally overlapped (noting some impacts may only occur during certain phases on the Onshore Scheme). Conceptual overlaps were also considered, as defined where an impact as the potential to directly or indirectly affect the receptor being assessed. Projects which are operational at the time of baseline characterisation are screened out of the CEA, as these are considered part of the EIA baseline.

82. Based on the nature of a topic-specific assessment and dependent on the individual ZoI, the consideration of the potential for cumulative effects will vary from topic to topic (this is to be expected based on the variation in geographical extent of potential impact and is in accordance with the guidance noted above).

3.4.9.5. ASSESSMENT OF CUMULATIVE EFFECTS


83. The CEA methodology follows the assessment methodology outlined in the sections above to maintain a level of consistency and so comparisons can be made across topic chapters. Whilst efforts will be made to ensure the CEA is quantitative and consistent across all topic chapters, the approach may differ depending on the nature of the topic, the level of data available for the CEA, the short list for the CEA and other practicalities. Where a wholly quantitative approach is not possible, a level of qualitative assessment determined using professional judgement will be presented.

84. Where potential effects assessed as negligible for the Onshore Scheme alone, or where a potential effect is highly localised, these will not be considered within the CEA as it is not considered that there will be a potential for cumulative effects. This is confirmed and stated throughout the topic chapters on a topic-specific basis.

3.4.10. Transboundary Impacts

85. Transboundary impacts arise when a development within one European Economic Area (EEA) state's territory affects the environment of another EEA state(s). Article 7 of the EU Directive 2011/92/EU (as amended by 2014/52/EU) ('the EIA Directive') requires the assessment of possible transboundary impacts.

86. The Applicant has performed a transboundary screening for all potential impacts and pathways on physical, biological, and human receptors with regard to the distance from the Onshore Scheme to the boundary of the Exclusive Economic Zone of EEA states in which there may be potential for transboundary impacts and has determined that the only scope for transboundary impacts for the Onshore Scheme will be in the event of major impacts on the populations of migratory species which breed or winter overseas. Impacts at this level have been avoided through appropriate siting of infrastructure and the implementation of mitigation measures. Transboundary effects are therefore not part of the impact assessment reported in Chapters 7 to 15.

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