UK Onshore Scheme

Environmental Statement

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Chapter 04

Environmental Impact Assessment Methods

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Environmental Statement Volume 2			
ES Reference	**Chapter**	**Chapter Title**	
ES-2-A.01	Ch01	Introduction	
ES-2-A.02	Ch02	Development of the UK Onshore Scheme	
ES-2-A.03	Ch03	The UK Onshore Scheme	
ES-2-A.04	**Ch04**	**Environmental Impact Assessment Methods**	
ES-2-B.01	Ch05	The Proposed Underground DC Cable	
ES-2-B.02	Ch06	Intertidal Zone	
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Glossary & Abbreviations

Glossary of Terms	
Term	**Meaning**
base scheme design	The design of the UK Onshore Scheme for the purposes of the planning application.
detailed scheme design	The design of the Scheme developed by the Contractor within the Limits of Deviation (AC and DC cables) and Rochdale Envelope (converter station).
Inter-project effect	The combined effects of the UK Onshore Scheme with other relevant developments which together may have a significant effect.
Intra-project effect	The combined effects arising as a result of the UK Onshore Scheme upon a single receptor or resource.
Mitigation measure	Measures which are incorporated into the design or construction of the Scheme to avoid, reduce, remedy or compensate for its adverse environmental impacts.
Limits of Deviation	These define the maximum extents of the corridor for which planning permission is sought and within which proposed DC and AC cable routes may be installed.
Phase 1 Consultation	Consultation on shortlisted landfall and converter station sites undertaken following siting studies.
Phase 2 Consultation	Consultation on potential DC cable route corridors undertaken following routeing studies.
the Project	Viking Link, from the connection point at Revsing Substation in Denmark to the connection Bicker Fen Substation in Great Britain).
Rochdale Envelope	This defines the parameters of the proposed converter station for which planning permission is sought including its location, layout and dimensions.
the Scheme	UK Onshore Scheme from MLWS to the connection point comprising underground AC and DC cables, converter station and access road.

List of Abbreviation	
Abbreviation	**Meaning**
AC	Alternating Current
AILs	Abnormal Indivisible Loads
BBC	Boston Borough Council
DC	Direct Current
DMRB	Design Manual for Roads and Bridges
EIA	Environmental Impact Assessment

List of Abbreviation	
Abbreviation	**Meaning**
ELDC	East Lindsey District Council
ES	Environmental Statement
EU	European Union
LoD	Limits of Deviation
LPA	Local Planning Authority
NGVL	National Grid Viking Link
NKDC	North Kesteven District Council
SHDC	South Holland District Council
UK	United Kingdom
ZoI	Zone of Influence

1 About Environmental Impact Assessment

1.1 Introduction

1.1.1 This chapter describes the approach to and outlines the scope of the Environmental Impact Assessment (EIA) of the UK Onshore Scheme (hereafter also referred to as 'the Scheme). This section provides general information about the EIA process including the key steps taken in the approach to EIA and the terminology used. For a detailed description of topic-specific assessment methods reference should be made to the relevant chapter e.g. for a description of the approach to landscape and visual assessment of the proposed DC cable route see chapter 11.

1.2 About EIA

1.2.1 EIA is the process of identifying, evaluating and mitigating the likely significant environmental effects of a proposed development such as those potentially occurring as a result of the construction and operation of the Scheme. Through the early identification and evaluation of the likely significant environmental effects of a proposed development EIA enables appropriate mitigation (that is measures to avoid, reduce or offset significant adverse effects) to be identified and incorporated into the proposed development's design, or commitments to be made to environmentally sensitive construction methods and practices.

1.2.2 The EIA of the Scheme has been undertaken in parallel with the development of the base scheme design thereby maximising opportunities to mitigate likely significant effects as they have been identified. This approach ensures mitigation is embedded in the base scheme design and forms an integral component of it.

1.2.3 The results of the EIA also ensure that decision makers, such as Local Planning Authorities (LPAs) and statutory consultees as well as other interested parties including local communities, are aware of a proposed development's potential environmental impacts and whether these may be significant or not so that they may be considered in the determination of an application for planning permission.

1.2.4 As described in chapter 1 Introduction, in the case of the Scheme the results of the EIA have been described within this Environmental Statement (ES) which accompanies applications for full planning permission to East Lindsey District Council (ELDC), Boston Borough Council (BBC), North Kesteven District Council (NKDC) and South Holland District Council (SHDC). The results of the EIA have been reported such that each LPA is aware of the likely significant effects of the Scheme as a whole as well as at the LPA level.

1.3 Legislative Background

Amendments to existing EIA legislation

1.3.1 In May 2017 European Directive 2014/52/EU (Ref 4.1) was transposed into UK legislation by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 ('the 2017 EIA Regulations') (Ref 4.2). Under the transitional arrangements the 2017 EIA Regulations do not apply to projects for which a scoping opinion has been sought prior to May 2017. Scoping for the Scheme was undertaken in August 2016 meaning that the 2017 EIA Regulations do not apply. Consequently the EIA of the Scheme has been undertaken taking account of the requirements set out in the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended 2015) ('the 2011 EIA Regulations') (Ref 4.3).

The Need for EIA of the UK Onshore Scheme

1.3.2 European Directive 2011/92/EEC (Ref 4.4) on the assessment of the effects of certain public and private projects on the environment ('the EIA Directive') establishes the legislative framework for EIA. The EIA Directive has a number of aims focused on reducing the environmental impacts of projects and ensuring informed decision making. The 2011 EIA Regulations include two schedules of development which are derived from the EIA Directive:

- Schedule 1 Development (Annex I of the EIA Directive): Development of this type requires that an EIA is undertaken and the results described in an Environmental Statement (or EIA Report) which accompanies the application.
- Schedule 2 Development (Annex II of the EIA Directive): Development of this type may require that an EIA is undertaken depending on the scale of the development, its characteristics and the sensitivity of the environment in which the development will take place. The results of the EIA must be described in an ES (or EIA Report) which accompanies the application.

1.3.3 There is no reference to interconnector projects or the components that they comprise (converter stations, submarine or underground cables) in either Schedule 1 or 2 of the 2011 EIA Regulations (or Annex I or II of the EIA Directive). However, having regard to the ruling of the European Court that the EIA Directive has a 'wide scope and broad purpose (Ref 4.5), the fact that a particular type of development is not specifically identified in one of the Schedules (or Annexes) does not necessarily mean that it falls outside the scope of the Regulations. Consequently, as a responsible developer, NGVL considered it appropriate that an EIA of the Scheme be undertaken and the results reported in this ES.

Content of the Environmental Statement

1.3.4 Schedule 4 of the 2011 EIA Regulations sets out the minimum information which must be included within an ES. **Error! Reference source not found.** summarises these requirements and identifies where the required information may be found within this ES.

Table 4.1 2011 EIA Regulations: Schedule 4 Requirements	
Legislative Requirement	**Where this information is in the ES**
1. Description of the development, including in particular— (a) a description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases; (b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used; (c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.	The UK Onshore Scheme is described in chapters 3, 5 and 19 of the ES: Chapter 3 provides a general description of Viking Link (the Project) and provides an overview of the UK Onshore Scheme. Chapter 5 provides a detailed description of the proposed Direct Current (DC) underground cable route from the landfall to the converter station, including details of the physical characteristics of the DC cable route, temporary supporting land take requirements, cable installation methods and proposed reinstatement works. Chapter 19 provides a detailed description of the proposed converter station including it physical characteristics and its construction and operation. It also includes details of the proposed permanent access road and proposed Alternating Current (AC) underground cable route from the proposed converter station to existing Bicker Fen 400 kV Substation.
2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for the choice made, taking into account the environmental effects.	The approach to the development of the UK Onshore Scheme through siting and routeing, and the alternatives which have been considered is described in chapter 2. This includes a summary of the assessment of alternative landfall and converter station sites as well as cable route corridors.
3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.	The results of baseline studies and the aspects of the environment likely to be significantly affected by the Scheme (referred to as receptors) have been identified and are reported in chapters 6-18 (for the proposed DC underground cable route) and chapters 20-31 (for the proposed converter station).

Table 4.1 2011 EIA Regulations: Schedule 4 Requirements	
Legislative Requirement	**Where this information is in the ES**
4. A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects of the development, resulting from— (a) the existence of the development; (b) the use of natural resources; (c) the emission of pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant or appellant of the forecasting methods used to assess the effects on the environment.	The likely significant effects resulting from the construction and operation of the UK Onshore Scheme including the direct, indirect, temporary, permanent, cumulative, beneficial and adverse effects have been identified, assessed and reported in chapters 6-18 (for the proposed DC underground cable route) and chapters 20-31 (for the proposed converter station).
5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	The measures proposed to prevent, reduce and where required offset any significant adverse effects (referred to as mitigation) are identified in in chapters 6-18 (for the DC underground cable route) and chapters 20-31 (for the converter station).
6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	A Non-Technical Summary of the key findings of the EIA is set out in Volume 1 of the ES.
7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant or appellant in compiling the required information.	Where relevant any assumptions or difficulties encountered in undertaking the EIA are set out in chapters 6-18 (for the proposed DC underground cable route) and chapters 20-31 (for the proposed converter station).

1.4 Scope of the EIA of the UK Onshore Scheme

1.4.1 As noted above in August 2016 a Scoping Report (Ref 4.6) was submitted to the affected LPAs (East Lindsey District Council (ELDC), Boston Borough Council (BBC), North Kesteven District Council (NKDC) and South Holland District Council (SHDC)) as part of a request for each LPA to provide their scoping opinion as to the information they required to be provided in this ES. The Scoping Report identified those aspects of the environment which were considered likely to be significantly affected by the Scheme and the approach to the identification and assessment of those effects. It also scoped out those aspects of the environment which were considered unlikely to be significantly affected. A copy of the scoping opinions provided is contained in Appendix 4.1 (ES-4-A.04). Table 4.2 provides a summary of the scope of the EIA and

subsequent sections set out how the matters raised in the scoping opinions have been addressed.

1.4.2 Matters which have been scoped out of the EIA are:

- Air quality: the construction and operation of the Scheme is considered unlikely to result in significant effects on air quality. Air quality effects will be predominantly limited to the construction phase relating the generation of dust and emissions from vehicles and plant. Good practice measures will be incorporated into construction and installation and will ensure that dust effects during construction are unlikely to significant.
- Traffic and Transport (operation): Operational effects resulting from traffic and transport are considered unlikely to be significant. Under normal operation vehicle movements will be limited during a typical working day and as such are considered unlikely to result in a significant effect on other road users. During periods of maintenance there may be additional movements including Abnormal Indivisible Loads (AILs) but these are considered unlikely to occur regularly.

1.5 Additional Consultation

1.5.1 As well as scoping, additional consultation has been undertaken throughout the development of the Scheme as part of siting and routeing studies and throughout the EIA informing the approaches to both baseline studies and assessment methods.

- Phase 1 Consultation: this was undertaken as part of siting studies considering alternative landfall and converter station sites. Statutory and non-statutory consultees as well as members of the public provided feedback which helped to inform the selection of the proposed landfall and converter station sites. Phase 1 Consultation is described in detail in UK Onshore Scheme: Phase 1 Consultation Feedback Report (August 2016) (Ref 4.7).
- Phase 2 Consultation: this was undertaken as part of routeing studies considering alternative route corridors between the proposed landfall and converter station sites. Statutory and non-statutory consultees as well as members of the public provided feedback which helped to inform the selection of a route corridor in which the proposed DC cable is routed. Phase 2 Consultation is described in detail in UK Onshore Scheme: Phase 2 Consultation Feedback Report December 2016) (Ref 4.8).
- Additional Consultation: this was undertaken throughout the EIA informing approaches to specialist assessments including data requests, the scope of and approach to field surveys, assessment methods and details of other projects to be considered as part of cumulative assessments. Subsequent chapters summarise the additional consultation topic-specific consultation which was undertaken and how it informed the scope of and/or approach to the EIA.

Table 4.2 Scope of the EIA		
Topic	**Proposed DC Underground Cable**	**Proposed Converter Station**
Intertidal Zone (Ch06)	This identifies and assesses the likely significant effects of the proposed DC underground cable on ecological and archaeological interests within the intertidal zone. The geographic scope of the assessment extends from Mean Low Water Springs (MLWS) to Mean high Water Springs (MHWS).	Not applicable.
Geology & Hydrogeology (Ch07 and Ch20)	This identifies and assesses the likely significant effects of the proposed DC underground cable on underlying geology (solid and drift), hydrogeology (groundwater) as well as the risks of encountering of causing contamination. The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable on underlying geology (solid and drift), hydrogeology (groundwater) as well as the risks of encountering of causing contamination. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.
Water Resources & Hydrology (Ch08 and Ch19)	This identifies and assesses the likely significant effects of the proposed DC underground cable on surface water resources, drainage infrastructure and flood risk. The geographic scope of the assessment extends from MHWS to the proposed converter station.	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable on surface water resources, drainage infrastructure and flood risk. Note separate Flood Risk Assessment of the proposed converter station has also been undertaken. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.

Table 4.2 Scope of the EIA		
Topic	**Proposed DC Underground Cable**	**Proposed Converter Station**
Agriculture & Soils (Ch09 and Ch20)	This identifies and assesses the likely significant effects of the proposed DC underground cable including the loss, damage or disturbance of underlying soil resources, the loss of agricultural land and impact on Agri-Environment Schemes (AES). The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable including the loss, damage or disturbance of underlying soil resources, the loss of agricultural land and impact on Agri-Environment Schemes (AES). The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.
Ecology (Ch10 and Ch21)	This identifies and assesses the likely significant effects of the proposed DC underground cable on designated sites, habitats and protected species. The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable on designated sites, habitats and protected species. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.
Landscape & Visual Amenity (Ch11 and Ch22)	This identifies and assesses the likely significant effects of the proposed DC underground cable on landscape character and visual amenity. The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable on landscape character and visual amenity. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.
Archaeology & Cultural Heritage (Ch12 and Ch23)	This identifies and assesses the likely significant effects of the proposed DC underground cable on designated and undesignated heritage receptors including where relevant the impact on their setting. The geographic scope of the assessment extends from MHWS to the proposed converter station. (Note impacts on archaeology and cultural heritage below MHWS are considered in chapter 6).	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable on designated and undesignated heritage receptors including where relevant the impact on their setting. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.

Table 4.2 Scope of the EIA		
Topic	**Proposed DC Underground Cable**	**Proposed Converter Station**
Socio-economics & Tourism (Ch13 and Ch24)	This identifies and assesses the likely significant effects of the proposed DC underground cable on employment (directly and indirectly) as well as on tourism and recreational resources. The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of the proposed converter station, permanent access road and AC underground cable on employment (directly and indirectly) as well as on tourism and recreational resources. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.
Traffic & Transport (Ch14 and Ch25)	This identifies and assesses the likely significant effects of the traffic generated by installation of the proposed DC underground cable. The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of the traffic generated by construction of the proposed converter station, permanent access road and AC underground cable. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.
Noise & Vibration (Ch15 and Ch26)	This identifies and assesses the likely significant effects of installation of the proposed DC underground cable on Noise and Vibration Sensitive Receptors (NSVRs). The geographic scope of the assessment extends from MLWS to the proposed converter station.	This identifies and assesses the likely significant effects of construction and operation of proposed converter station, permanent access road and AC underground cable on NSVRs. The geographic scope of the assessment is focused on the proposed converter station and its surrounding area.

2 Approach to Environmental Impact Assessment

2.1 Overview

2.1.1 The primary objective of the EIA of the UK Onshore Scheme, consistent with the requirements of the 2011 EIA Regulations, is to identify, assess and report the Scheme's likely significant effects. This has been done by following a systematic process through the steps described below and illustrated in Figure 4.1. The approach is iterative and has required a close working partnership between those designing the UK Onshore Scheme with those undertaking the EIA to ensure that consideration of potential environmental impacts formed an integral part developing the base scheme design.

2.2 Key stages in EIA

2.2.1 The key stages in the EIA are:

- Scoping studies: Scoping was the first step in the EIA process. As described above a scoping study was undertaken whilst the UK Onshore Scheme was being developed through siting and routeing. Scoping provided an opportunity for LPAs and other consultees to comment on the proposed scope of and approach to the EIA of the Scheme. Subsequent chapters set out comments received in scoping and how they have been addressed in undertaking the EIA.
- Baseline studies and consultation: These have comprised a combination of desk based studies and field surveys to establish an understanding of the existing environmental conditions ('the baseline') within the study area and therefore ensure an accurate assessment of the likely significant effects of the Scheme. Baseline studies have been ongoing since 2015 informing the identification of the Scheme through siting and routeing (within a larger study area) as well as forming the basis of the EIA (within more focused topic-specific Zones of Influence (ZoI)). As the Scheme has been defined, the scope of baseline studies has also become more detailed. The scope of baseline studies has been agreed with relevant consultees as part of scoping and where appropriate additional consultation. For some topics it is necessary to forecast changes in the baseline, if that baseline is expected to be different from the existing one. As such, some specialist chapters also consider a future baseline scenario.
- Impact prediction and identification of mitigation: The potential environmental impacts of the Scheme (both beneficial and adverse) have been predicted and evaluated using a range of specialist methods which are described in subsequent chapters. Through iterative assessment potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as possible. Where possible mitigation measures have been incorporated into the base scheme design such that they

inform its detailed design and/or how it shall be constructed. This approach provides the opportunity to prevent or reduce adverse effects from the outset. The mitigation measures are set out in subsequent chapters of the ES.

- Identification of likely significant effects: As stated above the purpose of the EIA is to determine the likely significant effects of the Scheme. A detailed description of the general approach to assessing impacts is contained in this chapter with detailed approaches tailored to individual environmental topics following topic-specific guidance contained in subsequent sections. The ES identifies the significance of both the potential and residual effects of the Scheme and identifies whether these are considered to be significant or not significant. Residual effects are those which remain taking into account proposed mitigation. As described above the approach to the development and EIA of the UK Onshore Scheme has resulted in much of the mitigation being embedded within the base scheme design. Therefore design and construction mitigation has been taken into account when evaluating the significance of the potential impacts meaning that in some instances the significance of residual effects is the same as that reported for potential effects.

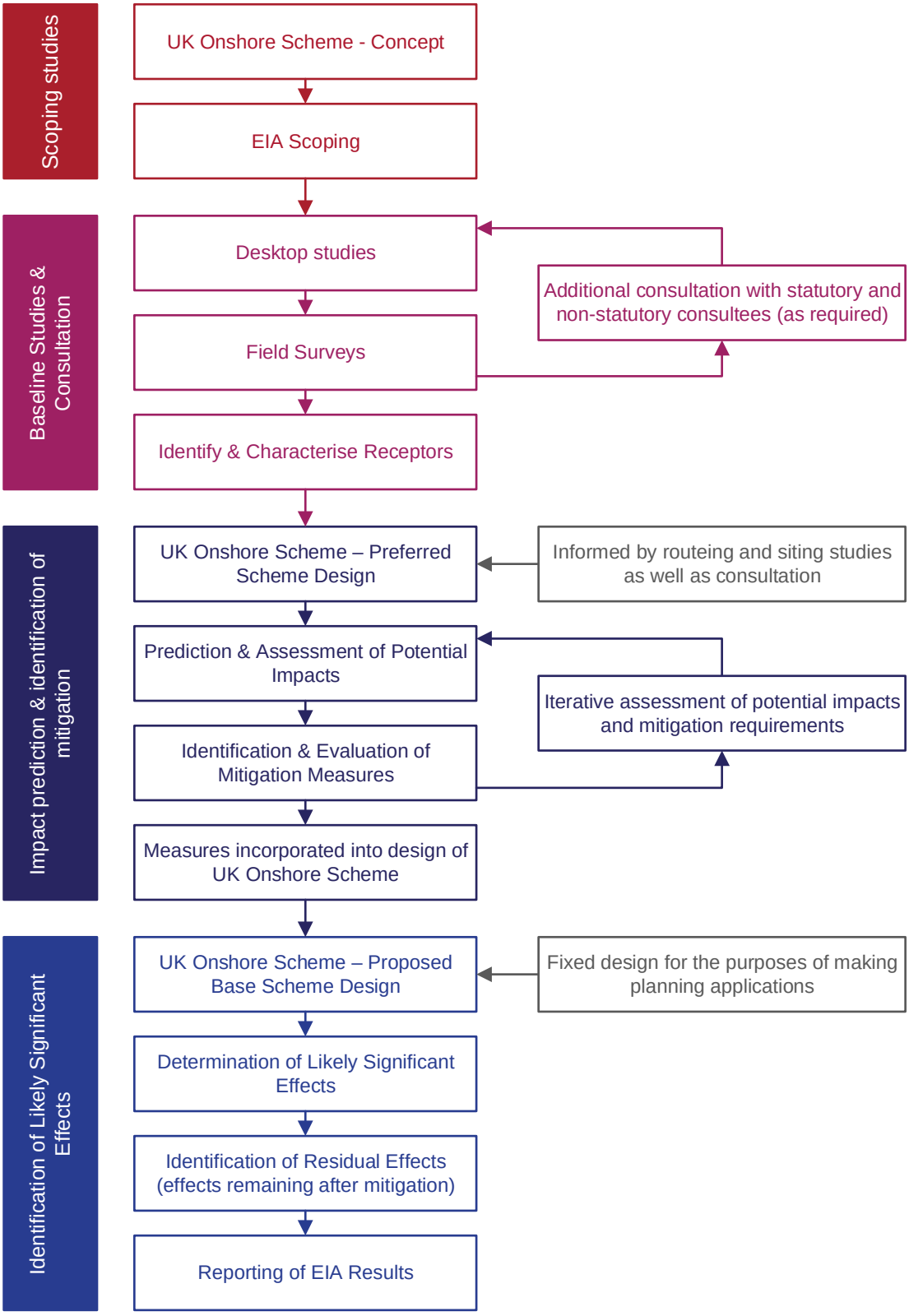

Figure 4.1 Overview of the approach to EIA of the UK Onshore Scheme

2.3 Assessment of Impacts

2.3.1 Whilst the 2011 EIA Regulations require that the likely significant effects of a development are assessed they do not define what constitutes a 'significant' effect. This is typically taken as a function of the importance or sensitivity of the aspect of the environment (referred to as a receptor) being affected and the magnitude of the impact which is occurring.

Describing the sensitivity, value or importance of receptors

2.3.2 General criteria for defining the sensitivity, value or importance of receptors likely to be significantly affected are set out in Table 4.3. Key factors influencing this include:

- The value of the receptor or resource based upon empirical and/or intrinsic factors, for example taking into account any legal or policy protection afforded which is indicative of the receptor or resources' value internationally, nationally or locally.
- The sensitivity of the receptor or resource to change, for example is the receptor likely to acclimatise to the change. This will take into account legal and policy thresholds which are indicative of the ability of the receptor or resource to absorb change.

Table 4.3 Sensitivity or Value Criteria

Sensitivity or Value	Description
Very high	The receptor has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low capacity to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

Describing the magnitude of impacts

2.3.3 General criteria for defining the magnitude of an impact are set out in Table 4.4. Key factors influencing this include:

- The physical or geographical scale of the impact, (note that this is relative to the scale of the receptor or resource affected).
- The duration of the impact - will it be short term, lasting for a few days or weeks, or long term, lasting for a number of years.

- The frequency of the impact - will it occur hourly, daily, monthly or will it be permanent lasting for the duration of the development.
- The reversibility of the impact - can it be reversed following completion of construction or decommissioning of the development.

Table 4.4 Impact Magnitude Criteria

Magnitude	Description
High	Total loss or major alteration to key elements/features of the baseline conditions such that post development character/composition of baseline condition will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character/composition of the baseline condition will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a "no change" situation.

Describing the significance of effects

2.3.4 The general approach adopted for evaluating the significance of effects is outlined in Table 4.5 below. It takes into account a combination of the sensitivity or value of the receptor being affected and the magnitude of impact which is occurring.

Table 4.5 Assessment of Significance

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

2.3.5 The 2011 EIA Regulations require the likely significant effects to be identified. The classification of significance is explained in Table 4.6, however, in simple terms effects predicted to be 'major' or 'moderate' are considered to be 'significant' whilst effects predicted to be 'minor' or 'negligible' are considered to be 'not significant'.

Table 4.6 Explanation of Significance Classifications		
Classification	**General Description**	**Significant?**
Major (adverse or beneficial)	A large and/or detrimental change to a valuable/sensitive receptor; likely or apparent exceeding of accepted (often legal) threshold or a major departure from national targets. A large and beneficial change, resulting in improvements to baseline conditions whereby previously poor conditions are replaced by compliance with accepted (often legal) thresholds or a major contribution is made to national targets. These are effects which may represent key factors in the decision making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to impacts on resources or features which are rare and cannot be relocated, or if lost, cannot be replaced.	Yes
Moderate (adverse or beneficial)	A medium scale change which, although not beyond an accepted (often legal) threshold, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of the development. Likely to relate to departure from relevant planning policy, rather than legal compliance. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets are contributed to. These effects, if adverse, are likely to be important at a local or district scale and on their own could have a material influence on decision making.	Yes
Minor (adverse or beneficial)	A small change that, whilst adverse, does not exceed accepted thresholds, legal or guideline standards. Unlikely to be a departure from planning policy. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues but are typically unlikely to be critical in the decision making process.	No
Negligible	A very small change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.	No

2.3.6 A significant adverse effect is not necessarily one that would make the UK Onshore Scheme unacceptable, nor is a significant beneficial effect necessarily one that would make the Scheme

acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision makers, are aware of the environmental impacts (in particular those which are likely to be significant) of the Scheme and consider these alongside other material considerations in determining the applications for planning permission.

2.3.7 In subsequent sections of this chapter the general criteria described above have been made more specific for each aspect of the environment based on relevant standards or guidelines. A detailed explanation of the approach to assessing impacts and the specific criteria to be used for each aspect is set out in later chapters.

2.4 Approach to Mitigation

2.4.1 A standard hierarchal approach to the development of mitigation measures has been followed with the aim of 'designing out' adverse effects as much as possible (avoiding, preventing or reducing adverse effects) as well as seeking opportunities to maximise or enhance beneficial effects. The EIA has been undertaken in parallel with the development of the Scheme providing opportunities to incorporate mitigation measures into its design or how it will be constructed.

2.4.2 The following approach has been used for developing and categorising mitigation:

- Design Measures: These are measures embedded in the base scheme design or inform/constrain the detailed scheme design. Examples could include measures such as the design of the cable route, the layout of the converter station or the use of acoustic enclosures.
- Construction Measures: These are measures incorporated into how the Scheme will be constructed and could include measures in relation to the timing of certain activities or silt control or dust suppression.
- Other Measures: These are other measures which have been identified which are neither design nor construction mitigation.
- Compensation Measures: These are measures to be implemented in the event that an effect cannot be mitigated and could include measures to offset the loss of an important feature or resource.

2.4.3 The EIA also identifies where it is considered appropriate to undertake monitoring as part of construction and/or operation of the Scheme. Monitoring provides a mechanism to take remedial action in the event that unforeseen significant effects occur. For example this could include monitoring the water quality in discharges to ensure that no contaminated water is being released or monitoring noise immissions to ensure that they comply with agreed limits.

2.5 Types of Effects

Temporary Effects

2.5.1 Temporary effects mainly occur during the construction phase only and are typically short term. This would include effects resulting from the construction of the Scheme such as construction traffic, noise and vibration from construction plant and machinery, dust generation and site runoff

as well as effects resulting from temporary loss of agricultural land or other temporary effects resulting from requirements for temporary access roads or compounds.

Longer Term, Operational & Permanent Effects

2.5.2 Longer term, operational and permanent effects are those which would occur as a result of the Scheme such as its land take or as a result of its operation. This would include effects which may begin during construction and endure for the lifetime of the Scheme (for example the loss of agricultural land for the construction of the proposed converter station) or effects which occur for a period of time following completion construction or during operation only (for example noise immissions associated with operation of the proposed converter station).

Decommissioning Effects

2.5.3 Decommissioning effects would be those which would occur as a result of the dismantling and removal of the Scheme at the end of its operational life and would typically be similar to those assessed for construction. The Scheme has a design life of 40 years, however, it is anticipated that rather than be decommissioned, components of the Scheme would be replaced to extend the Scheme's operational life. The likely effects of decommissioning the Scheme will be outlined in each specialist assessment chapter.

Residual effects

2.5.4 Residual effects are those effects that remain having taken account of mitigation measures. As noted above the approach taken to the EIA of the UK Onshore Scheme means that much of the mitigation is an inherent part of the base scheme design (design measures) and how it will be constructed (construction measures). As a result the significance of some residual environmental effects may be the same as the significance of the potential environmental effects. It should be noted that this is not because they have not been mitigated but rather that by incorporating mitigation into the design and construction of the Scheme from the outset effects have been mitigated as far as possible. In subsequent chapters this means that there may be more substantive reporting of the potential effects as opposed to the residual effects.

Cumulative Effects

2.5.5 Schedule 4 Part 1 of the 2011 EIA Regulations requires that as ES should include:

"*a description of the likely significant effects of the development of the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:*

(a) *the existence of the development;*

(b) *the use of natural resources;*

(c) *the emissions of pollutants, the creation of nuisances and the elimination of waste,*

And the description by the applicant of the forecasting methods use to assess the effects on the environment."

2.5.6 For the purpose of this ES cumulative effects have been defined under two categories; intra-project effects and inter-project effects. These two type of cumulative effects are explained below:

- Intra-Project Effects: The combined effects arising as a result of the UK Onshore Scheme upon a single receptor or resource. An example would be where a local resident is affected by dust, noise and a loss of visual amenity during the construction of the Scheme, with the result being a greater nuisance than each individual effect alone.
- Inter-Project Effects: The combined effects of the UK Onshore Scheme with other relevant developments which may, on an individual basis not result in significant effects but, together (i.e. cumulatively), have a significant effect.

2.6 Level of Design Detail for the Assessment

2.6.1 Interconnectors are complex electricity transmission systems for which National Grid Viking Link (NGVL) do not undertake significant detailed design work. The detailed design of the Scheme is Contractor-dependent and subject to a competitive tender process. NGVL has developed a base scheme design for the purposes of seeking planning permission. The base scheme design comprises:

- For the high voltage DC and AC underground cable routes: Limits of Deviation (LoD) have been used which establish the maximum corridor in which underground cables will be installed whilst providing some flexibility to make minor routeing adjustments should they be required, for example if unforeseen ground conditions are encountered.
- For the converter station: a 'Rochdale Envelope' (Ref 4.9) has been used which establishes the proposed converter station's maximum parameters including the location, layout and height of buildings and electrical plant and equipment as well as associated supporting development including perimeter roads, hardstanding areas, drainage and landscape planting.

2.6.2 This base scheme design establishes the maximum parameters within which the appointed Contractor will develop and construct the detailed design. This ensures that the EIA has been based on a realistic worst case assessment whilst also providing some flexibility for the appointed Contractor in designing and constructing the final Scheme. Crucially this approach also ensures that design changes do not vary to such an extent that they result in an unacceptable increase in the significance of an environmental effect.

2.6.3 Further information on the level of design detail on which the assessment is based is contained within chapters 5 and 19 which provide descriptions of the construction and operation of the proposed DC underground cable route and proposed converter station respectively.

2.7 Reporting the results of Assessment

2.7.1 Each specialist assessment chapter (for the proposed DC cable route and proposed converter station) follows a common structure as outlined below:

- Approach to assessment: this section describes the topic specific approach to assessment with reference to relevant standards or guidelines.
- Basis of assessment: this section describes the key assumptions related to the design of the UK Onshore Scheme including mitigation embedded in its design and construction.
- Planning policy and legislative considerations: this section outlines relevant topic specific policy and legislative considerations.
- Baseline conditions: this section describes the results of desktop and site based surveys undertaken to establish baseline conditions.
- Potential impacts: this section assesses potential impacts occurring as result of construction, operation and decommissioning taking account of embedded mitigation.
- Mitigation: this section outlines the mitigation which is proposed in addition to those mitigation measures which are embedded in the Scheme's design and construction
- Residual effects: this section identifies the residual effects of the Scheme (those remaining after mitigation). Where mitigation has been embedded in the design and construction of the Scheme residual effects may be the same as potential effects.
- Monitoring: this section identifies where monitoring is proposed to ensure the effectiveness of mitigation. Not all specialist assessments will identify monitoring.
- Cumulative effects: this section describes the intra-project and inter-project effects occurring as a result of the Scheme.
- Summary of assessment: this section presents a summary of the results of the specialist assessments.

3 References

Ref 4.1 European Directive 2014/52/EU amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment

Ref 4.2 Town and Country Planning (Environmental Impact Assessment) Regulations 2017

Ref 4.3 Town and Country Planning (Environmental Impact Assessment) Regulations 2011

Ref 4.4 European Directive 2011/92/EEC on the assessment of the effects of certain public and private projects on the environment

Ref 4.5 The Court of Justice of the European Union case C- 72/95 (Kraaijeveld v Holland)

Ref 4.6 National Grid Viking Link (August 2016) UK Onshore Scheme: Scoping Report

Ref 4.7 National Grid Viking Link (August 2016) UK Onshore Scheme: Phase 1 Consultation Feedback Report

Ref 4.8 National Grid Viking Link (December 2016) UK Onshore Scheme: Phase 2 Consultation Feedback Report

Ref 4.9 Infrastructure Planning Commission (February 2011) Advice Note Nine: Rochdale Envelope

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